R.R. 2100.14
MASSA'GETÆ, an antient people of central Asia, in an expedition against whom Cyrus is said to have lost his life. (Herod., i. 201-216; Justin., i. 80.) It is difficult to determine their position; but it appears probable that they dwelt north of the Xzartes (Sihon), in the country which was present inhabited by the middle hordes of the Kirghis. Herodotus says that they lived north of the Araxes, by which he probably means the Xzartes (i. 201), and to the east of the Caspian Sea. According to Strabo, the Hyperborei, Sauromates, and Arimaspi dwelt above the Euxine, the Ister, and the Adriatic; and the Sace and Massagetae above the Caspian (p. 597, Cassubon); and a little further he remarks that the Massagetae were to the east of the Danube, who bordered on the Caspian Sea (p. 511).

Herodotus was in doubt whether the Massagetae ought to be reckoned among the Scythians (i. 201); but they were usually regarded as part of the Scythian nation by succeeding writers. (Arrian, iv. 17; Pliny, H. N., vi. 19.) Herodotus appears to have used the name of Massagetae to designate all the nomadic tribes of central Asia east of the Caspian; while he confined that of Scythia to the country north of the Euxine and the Danube. The similarity of their name (Massa-geta; compare Tyri-geta, Tythas-geta) would lead us to suppose that they were connected with the Getæ of Europe.

The Massagetae are described by Herodotus as a numerous and powerful nomadic people, who resembled the Scythians in their dress and mode of life. Gold and silver were plentiful among them; but no iron nor silver was found in their country. They were however in a very low state of civilization even for a nomadic people. They had a community of wives; and their aged people were killed and eaten by their relations. (Compare Rennell’s Geography of Herodotus, sect. x.; and as to the custom of eating their parents, the article Bataas, and Moore’s Notices on the Indian Archipelago, Singapore, 1837.)

MASSA’RIUM, a provisional generic name of Blainville for Alcyonium Massa of Müller.

MASSILLA. [Marseille.]

MASSILLON, JEAN BAPTISTE, was born the 24th of June, 1665, at Hiers, in Provence, and at a very early age entered the Collège de l’Oratoire* of that town; but his father, intending him for the profession of a notary, withdrew him before he had completed his studies. Massillon however eagerly seized every opportunity of returning, and his father was ultimately prevailed upon to allow him to re-enter the college, which he did in 1681, and commenced the study of theology under P. de Beaujeu, afterwards bishop of Castrés. Here he read the sermons of Lejune, and, being pleased with them, made some attempts in that species of composition himself, which, although acknowledged to be successful, did not satisfy his own taste. In 1696 he was called to Paris to direct the seminary of St. Magloire, where he composed his first ecclesiastical conferences, which, although differing in tone from his sermons, were not wanting in vivacity. Although a great admirer of Bourdaloue, Massillon did not take him for his model: he was desirous of opening a new way, and of searching the human heart, its secret passions and interests, in order to arrive at the motives and combat the illusions of self-love by reason and powerful appeals to the feelings. In the pulpit he appeared without gesture or any extravagant display of action; nevertheless when he grew animated, his look and deportment became so expressive, that at this time, when the orators of the pulpit were held in high estimation as patterns of declamation, the celebrated actor Baron, struck with the beauty of Massillon’s style, exclaimed, ‘There is indeed an orator, but we are merely comedians.’ At Versailles he was as successful as he had been at Paris. The court of Louis XIV. was composed of men who might be touched though not convinced. Massillon felt this, and painted the passions with so much truth and such irresistible force, that even those whose vicious tendencies he exposed were constrained to love and admire him.

In 1704 he preached his second Lent sermon at the court, and with so much success that Louis XIV. promised he would hear him every two years; but for some reason unknown, Massillon was never again at Versailles. In 1709 he delivered the funeral oration of the Prince de Conti, which, though much applauded as delivered from the pulpit, was greatly criticized when it appeared in print. After the death of Flechier in 1710, Massillon remained the last of the orators of the grand siècle.

In 1717 Massillon was made bishop of Clermont, and preached before the king his last Lent sermon, which is considered to be his chef-d’œuvre; and in 1719 was consecrated in the king’s presence by Cardinal de Fleury. Massillon abolished in his diocese those indiscriminate processions that the ages of ignorance had perpetrated, and also certain superstitious customs spoken of in the Origines de Clermont. He died on the 18th September, 1744, of apoplexy.

The fame of this celebrated man stands higher than that of any preacher who has preceded or followed him, by the number, variety, and excellence of his productions, and their elegant and harmonious style. Grace, dignity, and force, and an inexhaustible fecundity of resources, particularly characterize his works. His Avent et Carême, consisting of six volumes, may be justly considered as so many chef-d’œuvres. Massillon, in his sermons, endeavored to convince the young king Louis XV. that he derived his authority from the people, and should never exercise it but for their advantage, nor deceive himself by thinking that he could do no wrong.

The most interesting of his works, next to his sermons, are his ‘Conférences,’ which are discourses addressed to the young ecclesiastics under his direction in the seminary of St. Magloire.

In a discourse entitled De l’Ambition des Clercs, he contends that the Church has no need of great names for its support. (Vol. XV. p. 519.)
be for the detestable folly of Warburton, through whose carelessness the MSS. were destroyed by a servant."

There is a peculiar interest in Massinger's plays derived from the fact that they are in the times in which they were written, and the bearing and influence which they must have exercised on those national feelings from which, as is probable, they took their own actual shape. No one who reads the play called 'The City Madam' can help seeing in it the exposition of a question that has excited the deepest interest among the most respectable part of the English people, and the same is true of the direct exhibition of many of those opinions and feelings which took such active part in the Revolution then impending. We see there portrayed a city opulent to extravagance, couriers needy and unprincipled, and a landed proprietor of the West Indies by whom some of the barons of the realm, appearing to advantage as a blunt honest man contrasted with a noble, overbearing and insolent, though not intended by the poet to exhibit any virtues except those incident to all members of his order."

Still no matter, for the political doctrines contained in 'The Maid of Honour.' Massinger is, we believe, the only dramatist of his time who did not either openly or in secret espouse the court doctrine of the divine right of kings. A line in one of his Comedies is worth quoting, as it gives what is evidently the poet's view of the subject. She says there to the king of Sicily—

"When you are unjust, the deity
Which you may challenge as a king, presides from you."

And this is one of the endless instances in which Massinger evidently conveys his own sentiments on questions then stirring, through the mouths of his characters. In fact, an analysis of the political references in Massinger's plays would be a work of great extent, as they abound in this manner of speaking. But it is the same, we believe, with interest, if it were only for the sake of possessing a comment on the events and opinions of the day, by a man like Massinger."

Massinger's plays are distinguished by an almost entire abstinence from common oaths, and although we cannot add to this that they contain no coarse or even disgusting passages, we may, in respect to some of them, those for instance in the 'Virgin Martyr,' shift the blame from Massinger to himself to his coadjutor in the composition; for it may be said, whether it were for the sake of possessing a comment on the events and opinions of the day, by a man like Massinger."


**MISSISSA. [NOMINAL.]

MASSOWAH. [ABBREVIAT.]**

**Mussura'da, or Messura'do, Cape, is situated on the western coast of Africa, in 6° 20' N. lat. and 10° 30' W. long. It is a range of bold cliffs, perpendicular heights on the west and north-west sides, but declining gradually in other directions. It forms the southern extremity of a bay which affords good anchorage in the dry season, but is open to the north-west.** Massura'da Bay receives the river Massura'da or Rio Dorno, which runs along the coast of Africa that terminates in the cape, and would fall into the sea close to the cape if it were not for a spit of land which runs from the latter in a north-north-east direction across the stream and turns it along the shore for about half a mile. At the end of this spit a town is built on the principal place in the American settlement of Liberia. This settlement was formed in 1821, by the American Colonists-
M A S

tion Society, on nearly the same principles and for the
same object as the English settlement at Sierra Leone.
The Society acquired by purchase the country along the
cost lying between Cape Mount and Trades Town in the
kingdom of Sanguin, on the Grain-coast of Guinea, an
distance of about 140 miles. Many small rivers water this
cost; and though most of them are surrounded by shoals
and rapids, boats can usually penetrate them for about 60
miles, after which the navigation is usually impeded by
cataracts. The country is generally level, and well adapted
to the cultivation of Indian corn and rice. The rice raised
on the coast here is highly prized. Several fruit-trees are indigenous,
as the banana, bread-fruit, and other fruits of the same kind.
The gardens extend for many miles inland, and in the
interior. The mean annual temperature appears to be
between 76° and 78°, and in the dry months from June to
October the country is frequently visited by thunder or
hurricanes from the north-west.

The inhabitants are a race of negroes who have obtained
their liberty in the United States or are born of free negroes,
and such as have been taken from vessels engaged in the
slave-trade. According to the laws of the Society, whites
are not permitted to settle in this colony, with the exception
of the agents, some blacks employed in navigation, and
missionaries.

The blacks enjoy all the rights of free citizens, as
in the United States themselves, and choose their own
representatives, among whom are two censors, who look after
the morals of the inhabitants. In 1828 the number of the
settlers amounted to 1,250, of whom 700 were in Monrovia,
but it is said that the number has considerably increased
of late. The settlers are more occupied in trading with the
neighbouring nations than with agriculture.

(Mrs. Lea's Life of the American Colonists of Free Negroes
on the Coast of Africa; and West African Sketches.)

MARVEL OF ARTS. [Arts.]

MASTERWORT, the old name of an umbelliferous plant
with flabby tuberous roots, growing in moist meadows and
woods in the north of Europe and in Newfoundland. It has a
stem from one to two feet high, broad twine-ternate leaves,
flat large umbels of white or pink flowers, and thin orbicular
straw-coloured fruit. Botanists call this plant Imperatia Ostruthium;
it has acrid, bitter, somewhat aromatic roots, and was once a remedy for toothache, and as a cure for agues, whence no doubt its names have been derived. It retains a place in continental medical practice, but it is disused in England.

MASTIFF, a term which is extracted from the trunk and
branches of the Punja lentissus by incision. This
tree grows in the Levant, and particularly in the island of
Chios. The fluid which exudes soon concretes into yellowish-white grains or tears, which are semitransparent, bright and very bitter. It acts as a verticium for
boiling; it has a great reputation as a remedy for toothache, and as a cure for agues, whence no doubt its names have been derived. It retains a place in continental medical practice, but it is disused in England.

MASTIC, a resin which is extracted from the trunk
and branches of the Punja lentissus by incision. This
tree grows in the Levant, and particularly in the island of
Chios. The fluid which exudes soon concretes into yellowish-white grains or tears, which are semitransparent, bright and very bitter. It acts as a verticium for
boiling; it has a great reputation as a remedy for toothache, and as a cure for agues, whence no doubt its names have been derived. It retains a place in continental medical practice, but it is disused in England.

In foreign Pharmacopoeias mastic is employed in several
ointments, pastes, and other preparations; it is retained in
the Materia Medica of the London Pharmacopoeia, but does not enter into any preparation except as a verticium for
boiling; it has a great reputation as a remedy for toothache, and as a cure for agues, whence no doubt its names have been derived. It retains a place in continental medical practice, but it is disused in England.

MASTIFF, the name of a variety of dog of a very old
English breed, now seldom seen in its original state of
purity. Manwood states that the word is derived from
mass thefaze, because it is supposed to terrify thieves by its
voice, which, when the animal is excited, is fearfully loud. This is the Doque de forte race of Baffin and the French,
the Mastiff of Ray, the Canis Molosus of LINNAEUS, and
the Villaticus of CATENARIUS of Dr. Caius.

A true-bred mastiff is of considerable size, and very
stoutly built. The head is well developed and large, the
line deep and pendulous on each side of the mouth, and
the whole aspect noble.

It appears from Claudian and Gratius that the British
dogs, mastiffs probably, were highly prized at Rome; and

Camden notices the employment of a special officer, Pro-
curator Cynguoti, appointed in Britain for superintending
the breed of these dogs and their transmission to that city,
where they appeared in the combats of animals at the am-
philitheatre, and sometimes upon occasions even more cruel,
for there can be little doubt that they were set to worry
those unhappy Christians whom the tyrants of the time
ordered to be sewed up in the skins of beasts and then
exposed to the attacks of those powerful and savage dogs.
Pennant quotes Strabo for the fact that the Gauls trained
British mastiffs for war, and used them in their battles.
According to Dr. Caius, three were a match for a bear,
and four for a lion; but Stow mentions a lion-fight with three
of these dogs, in which, though two were disabled, and
afterward died, the lion was so much harass'd that he
retreated, and refused to resume the battle.

The mastiff is capable of great attachment, and when
kept as a guard is of unfailing vigilance, giving the alarm
by its powerful bark, and never ceasing till it has roused
the family or secured the intruder. It is now comparatively
little used as a watch-dog, especially in great towns, where
an active police has almost entirely superseded it.

MASTODON, the name of an extinct genus of gigantic
Pachydermatous Proboscidian Mammals (Mastotherium,
Pachyrhino), whose remains are found abundantly in the third
and fourth, or Pliocene, divisions of the tertiary fresh-water
deposits, and also, but less frequently, in the deposits of the
young or Miocene period.

In the greater portion of their organization the Mastodonts
must have closely resembled the elephants. The tusks, the
proboscis, the general conformation of the body and the
limbs, were very similar; and the principal distinction be-
tween the two genera was formed by the molar teeth.
These indeed were gradually pushed forward from behind
as they are in the elephant, and displayed the same relative
increase in proportion as the animal was advanced in life;
but, unlike those of the elephant, their crowns exhibited
on cutting the gum large conical points of a mannniform
structure, whence the animal derives its name. As these
coronal points were worn down by mastication, the tooth
presented disks more or less large according to the degree
of attrition which it had undergone. The following cuts,
which are very much reduced in size, as will be understood
from what we have already stated, will explain this differ-
ence in the tooth more clearly than words. Before the tooth
has suffered from desirrict it presents the following appear-
ance:--

Molar tooth of Mastodon, not worn.

And after exposure to a comparatively small degree of
dentition it has the aspect represented in the following cut,

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The remains of the Great Mastodon, *Mastodon giganteus*, appear to have been the first that attracted attention. These occurred in considerable abundance in North America. They gave rise to much speculation and much erroneous opinion, at first; for though the form and size of the molar teeth forbade the inference that they could have belonged to any of the large existing animals, the formidable appearance of the pointed conical tubercles of the crowns led to conclusions directly the reverse of truth, as we shall presently see. Daubenton, indeed, at first thought that some of these teeth belonged to the Hippopotamus; but he soon perceived that they must have formed part of an animal which had no recent analogue, and Buffon announced that the whole evidence afforded by the remains led to the belief that this antient species, which ought to be regarded as the first and the largest of terrestrial animals, existed only in the first ages of the world ('ça subsista que du roi les premiers temps'), and never had come down to our time. This opinion of Buffon did not extend beyond the larger molar teeth, and he still regarded the muddling sized and worn teeth as those of the Hippopotamus; be he also followed Daubenton in considering the femur found with the teeth as that of an elephant, though Dr. Hunter (William) had pointed out the differences between it and the same bone in the elephant, as well as the distinctions existing in the teeth and lower jaw. (Phil. Trans., vol. xiii.) But while William Hunter did this good service, he introduced no small confusion and error. He had heard of the Siberian Mammoth, and not having seen the bones of that animal, he immediately concluded that it was identical with the North American fossil, and gave the name to the latter, a nomenclature which was for some time adhered to both by the Anglo-Americans and the English. The skeleton of the Great Mastodon was exhibited at London and Bristol as the Mammoth, and accounts of it under the same name were published in London in 1802 and 1803. Nor was this the only error of which William Hunter was the parent, for notwithstanding the rejection of such an opinion by Camper, the former declared that, from the structure of the teeth, the Mammoth, as he termed it, was carnivorous; and men, ever prone to catch at the wild and wonderful, greedily adopted this marvellous view, and named the gigantic beast the Carnivorous Elephant. We well remember in our early youth hearing the speculations of some as to the sort of prey on which the monster lived, and as to the great services that its enormous tusks, which in the skeleton above noticed were placed in an inverted position, with the curvature downwards, must have rendered when the animal was on its predatory excursions. The confusion created by the application of the same name *Mammoth* to two different genera was great, and for a long time almost inextricable, notwithstanding the endeavours of Pallas, who clearly refuted the supposed identity of the Siberian and American animals, by showing that the Siberian *Mammoth* is a true elephant. Cuvier at once dissipated the clouds that had gathered over the subject, and while he clearly pointed out the osteological differences between the two genera, gave to the supposed *Mammoth* of America the appropriate name of *Mastodon* (from *Mastix*, a tooth; *eléphant*, a tooth).

The first notice of the teeth and bones of this extinct genus of pachyderms appears to be in 'Phil. Trans.' (vol. xxix., 1714), a century and a quarter ago; and it is not instructive to observe what rapid strides natural science has made since that time, when the Royal Society of London published in their Transactions Dr. Mather's letter to Dr. Woodward, in which the former gives an account of a large work in MS. in two vols. folio, but does not name the author. Dr. Mather recommends this
work, which appears to have been a commentary on the Bible, with large philosophical remarks. To the former effect, a passage announcing the discovery, in 1706, of enormous bones and teeth at Albany in New England, as the bones of a giant, appealing to them as a confirmation of the text in Genesis (vi. 4); another example, if any were wanting, of the folly and danger of mixing up religious questions with scientific inquiries. Portions of remains were sent to France and England at different intervals, and elicited the observations of European zoologists, whilst in America materials were collected for forming two complete skeletons by the zealous industry of Mr. Peale.

Of these two skeletons one was placed in the museum of Mr. Charles Wilson Peale in Philadelphia, and the other was exhibited in London and Bristol by his son Mr. Rembrandt Peale, who published two accounts of it under the name of the Mammoth above alluded to.

One of the principal deposits of Mastodon bones appears to have been the Big-bone Lick in the north part of Kentucky, near the Ohio, whence the Mastodon has been called 'the animal of the Ohio.' None of the remains have the appearance of having been rolled, but seem to have been unrolled since the death of the animal; and it is worthy of remark that those which were found at the river Great Miami, which runs into the Mississippi a little above its confluence with the Mississippi, were in a vertical position, as if the animals had been bogged or buried in the mud. [M. GATHERED.]

The traditions which were rife among the Red Men concerning this gigantic form and its destruction must not be passed over in silence. M. Fabri, a French officer, informed Buffon that the savages regarded these bones scattered in various parts of Canada and Louisiana as belonging to an animal which they named le Père aux bois. The Shawnee Indians believed that these enormous animals there existed men of proportionate development, and that the Great Being destroyed both with thunderbolts. Those of Virginia state that as a troop of these terrible quadrupeds were destroying the deer, the bisons, and the other animals created for the use of the Indians, the Great Man slew them all with his thunder, except the Big Bull, who, nothing daunted, presented his enormous forehead to the bolts, and shook them off as they fell, till, being at last wounded in the side, he fled towards the great lakes, where he is to this day.

Buffon seems to have been the first who noticed the occurrence of these teeth in the Old World, and figures one alleged to have been found in Little Tertary, and given to him by the Comte de Vergennes. This is very large, having from eight to ten points and weighing eleven pounds four ounces. He also figures another from the museum of the Abbé Chappe, said to have been brought from Siberia. Pallas announces another instance; and gives a figure of one from the Oumil Mountains. Cuvier states that he for a long time thought that his Mastodon giganteus inhabited the Old Continent as well as America, but he confesses his doubts as to this point. The Abbé Chappe, he remarks, had been in California, and there is no certain evidence that he brought back his Mastodon tooth from Siberia. The tooth figured by Pallas, he thinks, may perhaps have belonged to Mastodon angustidenti, and he asks, who shall assure us that the Comte de Vergennes was not in error as to the locality of the great molar presented by him to Buffon, and which, together with that formerly in the cabinet of the Abbé Chappe, is in the Paris Museum? Cuvier sums up by saying that he does not entirely pretend to invalidate these three proofs, but that he begins no longer to regard them as sufficient.

The following species have been named: Mastodon giganteus, M. angustidenti (Europe, America?), M. Andium (Andes), M. Humboldti (Concepcion—Chili), M. minutus, M. Tapropodes, M. Tungentis, M. Ameriensis (Eppelsheim, Puy de Dom), M. elephantoidea (Irawaddi, Sewallik Mountains), M. latidens (Irawaddi, Sewallik Mountains), and M. longirostris, Kaup. Professor Owen has referred the teeth from the Norfolk erag to the last-named species.

Example, Mastodon giganteus (Cuv.—Syn., Mastodon maximus (Cuv.), Mammut Ohioticus (Blum.), Harpogantherium Canadense (Fisch.), Elephas carnivorus (Gul. Hunter), Mammoth of William Hunter and of the Anglo-Americans.

Young.—Tetraconodon. (Gom.).

Localities.—The United States, Europe?

This species must have equalled the Elephant in height, but seems to have been longer and stouter in its proportions.

Remains of Mastodon were found by Capt. Cautley in the Sewallik Mountains; and in assigning an age to the formation, the Captain adopts the views of Dr. Falconer, who considers the deposit to be synchronous with that from which Mr. Crawford obtained the remains near Prome, on the banks of the Irawaddi. Captain Cautley having found jaws in which the front teeth are not to be distinguished from the teeth of M. latidens, and those in the rear from the teeth of M. elephantoidea, he conceives that the distinction which was established on detached teeth will be found to be erroneous.

The genus Tetraconodon of Godmann is, according to the best authorities, the young of the great Mastodon—Mastodon giganteus. One species only, Tetraconodon Mastodontoides (Godm.), is recorded. (Harlan, Bull. des Sc. Nat. et de Géol., 1836.)

MASTODONSAURUS, Dr. Jager's name for an extinct.

* Skeleton of Mastodon giganteus.
saursian found in the *alaunschleifer*, or alum slate (Würtemberg), founded upon teeth, the largest of which, with part of the stone adhering, is figured below, one-half of the size of the original. The other teeth were considerably smaller.

Dr. Jüger is of opinion that these teeth must be held to approach the nearest to those of the animals belonging to some of the species of *Monitor*. The *Mastodonaurus*, from the length of its teeth, may be said, in his opinion, to have equaled the *Mastodon* of Maastricht in size; but in the formation of the teeth the former differs from the latter. The small teeth, he observes, agree so much in every respect with the large one, that their difference in size is only to be ascribed to their having belonged to animals of a different age, but not of a different genus, and to their having occupied different places in the jaw.

(De Jüger’s memoir, *Über die fossile Reptilien welche in Württemberg aufgefunden worden sind*, Stuttgart, 1828.)

**MASULIPATAM**, a district of the province known as the Northern Circars in Hindustan. It is bounded on the north by Rajamundry, on the east by the Bay of Bengal, on the south by Guuntur, and on the west by the dominions of the Nizam. The district which now goes under the name of Masulipatam comprises three of the five original Northern Circars, viz. Condappi, Ellore, and Masulipatam, and forms a collectorate under the English government. The population amounted, in 1822, to 54,754, and the public revenue to about 150,000. This district contains a large proportion of uncultivated grass-lands, and towards the north there is a great deal of jungle. The principal produce is grain, and some cotton of good quality is raised.

(Masulipatam, the capital of the district, is a seaport of some consequence, in 16° 10’ N. lat. and 81° 14’ E. long. About a mile and a half south-east from the town is a fort in the form of a parallelogram, 800 yards long by 600 yards broad: there is a straight causeway between the fort and the town upwards of 2000 yards long. There is a considerable manufacture of chintzes in the town and neighbouring great quantities of which are exported: they are much esteemed in the greater part of Persia. This is almost the only part of that line of coast on which the surf does not beat; it affords good anchorage for ships of 300 tons burthen. The French established a factory at this place in 1758. It was taken by assault in 1759, by the English under Colonel Forbes, and has since continued in our possession. Masulipatam is 203 miles from Hyderabad, 292 miles from Madras, 764 from Calcutta, and 1084 from Delhi, all travelling distances.

**MATARUNGA. [Hindustan.]**

**MATAGORDA. [Mexico.]**

**MATÁPAN, CAPE. [Lacoina.]**

**MATARO**, a seaport of Catalonia in Spain, in 41° 33’ N. lat. and 2° 30’ E. long. It is said to have been founded by the Romans, and to be identical with the Iluro of Prolemay and Phiny, but the Roman city was farther inland than the existing town of Mataró, which was founded and named by the Arabs.

The more ancient or Moslem part of Mataró stands on a rising ground, some distance from the sea; it is small, well enclosed with walls; the streets are narrow and gloomy, with the exception of one called La Riera, which is broad, straight, and handsome, and intersects the town. The modern part of Mataró is of much greater extent, and stretches from north to south. The houses are, on the whole, broad, and regular; the houses are neat, and many have their façades painted in fresco as is common in Spain and Portugal. One parish church, five convents (now unoccupied), and an hospital, are the principal public buildings. The population is not great. In 1809 the number of the present convents was about 25,000, and was increasing rapidly, but must now be estimated much lower. The manufactures and commerce of Mataró at the same time, owing to the industrious and enterprising spirit of the inhabitants, were in a most flourishing condition, but the loss of the town to which this town used to export calicoes, laces, velvets and other manufactures in silk, gave the death-blow to its prosperity.

The scenery in the neighbourhood of Mataró is exceedingly picturesque. Inland from the town extends a small but most fertile and cultivated plain, the farms in which, says Townsend, are so many gardens, watered by artificial means, and producing on the same spot of ground corn, wine, oranges, and olives, &c. Bounding the plain are ranges of mountains, whose slopes are luxuriantly clothed with woods. The red wine grown in the plain of Mataró is esteemed the best in Catalonia.

(Laborde, *Itinéraire Descriptif de l’Espagne; Townsend’s History of Spain; Ingla’s Spain in 1830.**

**MATE** [Paraguay Tex.]**

**MATÉIRA MEDICA** is that branch of medical science which treats of the articles employed in the practice of medicine, and embraces an explanation of the nature and modes of action of those substances which are recommended in order to restore the healthy state of the human frame when its functions or structure are impaired by disease. Thus defined it comprehends both pharmacology and therapeutics. The former means an account of drugs, simple or compounded, in relation to their physical characters, medical history, commercial history, chemical composition, and modes of exhibition. The latter means an exposition of the principles which should regulate their employment. The pharmacological part of the subject is sufficient to treat of under each article, as it presents itself in alphabetical order, and it is only requisite to treat here of the general principles involved in their practical application. For the full and satisfactory comprehension of this department, it is necessary for the student to be conversant with the structure and, above all, of general anatomy, and of the respective duties and offices performed by its component organs while in a state of integrity, or physiology, and of the various degrees of departure from these, when from any cause they become diseased. It is necessary that he should note in their actions, and the signs by which the morbid states are indicated, or nosology, is required. These departments of science are studied only by those persons who intend to follow the medical profession, and at their hands only can a skilful employment of medicines be expected. Something however may be done for the advantage of the public by pointing out how medicines act, and in what way they prove remedial. The object of the administration of a medicine is to arrest the progress of the disease, to remove the cause, and to remove the symptoms of its existence, that is, to restore the individual to perfect health, such as he enjoyed before the organ or organs received the impression of the morbid cause; or where both or either of these objects cannot be accomplished, it is as much as can be expected of medicine. As men attain a comparatively late period of the life. To improve and perfect this most important branch of the healing art is the end and aim of all the other branches of medical science. The knowledge of this subject has varied with different stages of the human civilization, and according as different theories of the nature or cause of diseases have prevailed. Many of the medicines formerly in use were of a disgusting or repugnant nature, or of a kind devoid of any salutary property, and therefore introduced into practice by superstition, credulity, or a misapplication of the principles of natural and chemical philosophy, and have long been discarded by scientific pro-
MAT

7

ension, though frequently retained by the populace or by
quacks. The medicines used in the present day are still
drawn from all the three kingdoms of nature, which, the
annual kingdom yields few, the vegetable kingdom a con-
siderable number, and the mineral kingdom the greatest
number and the most active.

In general a few articles produce much effect on the human
system, either in a state of health or disease, through
physiological properties, impressing the senses of
smell or taste in a distinct manner. Hence bland
insipid articles are mostly better fitted to furnish nourish-
ment than medicines, being completely digested, and cre-
sing no disagreeable effect. In current currency, wound
discharge, or suppuration; medicinal substances on the con-
trary do not appear to be thoroughly digested, but a portion
remaining unassimilated acts in some measure as a foreign body,
and produces a stimulant or alterant effect on the vital power.
Many medicines are indeed absolutely to worms if given in
large doses, or where no diseased state of the system
requires their administration. For disease often gives to the system
a power of sustaining the action of a dose of medicine which
would produce serious disorder if given to a person in health;
the merited state of the system seeming to act as an antido-
tive to the medicine, while the medicine acts as an antidote
to the disease—health being the result of their neutralizing
power.

Machines produce two distinct effects: one termed the
primary, or in some cases, as when given to a healthy per-
son, the physiological effect; the other secondary, or cura-
tive, which can only take place when there exists a disease
to be removed. The former is generally uniform or con-
stant, but the latter may be rough or uncertain, depending
on the degree of uncertainty in the latter and most important
of the two kinds of action, many zealous medical men have
instituted experiments with different medicines on them-
selves or others; while chemists have carefully investigated
the chemical properties of animals, vegetables, and min-
erals, in order to understand their active principles, or to
exhibit their modes of action. Notwithstanding these valuable aids, therapies is
still the most imperfect of all the departments of medical science, mainly from the difficulty inherent in the subject,
not partly from the diversity of men in respect to the
medicine, but as far as the evidence respecting the effects of the medicines. The union
of several articles in one prescription, by which we attempt to
be stroke to remove several symptoms, tends still
further to obscure the results, and to vitiate the conclusions
which may be drawn. The polypharmacy of the antients
has been in a great measure abandoned, but still it must be
confessed that simplicity in prescribing is not sufficiently
studied. (Holland's Medical Notes and Reflections on Medicine, 1774, p. 57.)

On the other hand, the attempt to isolate the supposed active
principle of many vegetable remedies, and to administer it
separately, though in some instances advantageously, by diminishing the size of the dose, or concealing the
remedy in some form, or in a mixture, which may excite the
sequences expected; for example, in most cases cinchona
bark administered in some of the old preparations will be
found a more valuable tonic than quinine. The superiority
of many mineral waters, which contain a variety of ingre-
dients in a state of extreme dilution, is the advantage
of the saline materials in a less quantity of liquid, seems
to militate against the practice of excessive concentration.

The introduction of new substances enters into the Materia
Medica by the discovery of new therapeutic perceptions. Thus,
the discovery of chemistry, may supply deficiencies in the catalogue of rem-
dies. But less benefit to mankind will flow from a mul-
tiplication of remedies, than from the establishment of clear
and scientific rules for their administration. Every improve-
ment in the art of treating will promote the advancement
of therapeutics, by leading to greater precision in the
employment of medicines. For nothing is more certain
than that medicinal substances act upon special parts of
the body, in preference to others, and in many instances on
the same parts of the body with different degrees of
mildness. The careful investigation of the modes of action
of medicines is worthy of the best faculties and energies of
medical men, and every contribution to this department of
knowledge should be regarded as an inexcusable benefit con-
ferred on mankind.

(Peroni’s Elements of Materia Medica; and Vogt, Lehr-
buch der Pharmakodynamik.)

MATERIALISM is a name applied to any philosophical
system which denies the existence of a spiritual or imma-
terial principle in man, called the mind or soul, distinct
from matter, or which (changing the phrase) denies the
immateriality of the soul and the body. The name is applied to systems
which differ very widely from one another, in respect of the
consequences deduced from the denial of the soul's imma-
teriality: and thus it comes to pass that the popular mean-
ing of the word "materialism" is not very correct, compre-
hending what are no better than accidental or superficial additions of
the pure and proper idea. Such accidental consequences
are the denial of a future state and absolute atheism; and
it need not be said that atheism and materialism are treated
in a convertible sense.

The name materialism also is one of that sort for which
Mr. Bentham has constructed the epithet dystoxicotic. As
applied in current conversation, it always carries with it
the idea of a system by which, from the nature of the acci-
tential consequences which have been indicated, and which
mankind regard with horror: but insomuch as the name
still continues to be applied to systems from which unchris-
tian and atheistical consequences are expressly excluded,
even to some systems (such as that of Hartley) which
admit the existence of a separate soul, but in whose method
of explaining mental phenomena there is a dash of mate-
rialism, the censure that can be indissolubly asso-
ciated with the name often falls with grievous injustice.

For there is nothing so singular in the philosophic terminology better fitted to exemplify the evils
of looseness of application, or of allowing feelings to tinge
and discolor the notions conveyed by names.

The systems to which the name materialism is applied
may be divided under three heads:—systems that deny
it is applied (as has been already said) to a system like that
of Hartley, which admits the existence of a soul, but which,
by attempting to explain mental phenomena physically or by
movements arising out of the bodily organization, seems to
insinuate materialism, is it a system, as that of Hobbes and Priestley, and of the French school of
writers, of which De la Mettrie may be taken as a specimen, which
strictly deny the existence of a soul as a separate prin-
cipal in man, but which do not deny the existence of
immateriality. In the systems of those writers is evolved the
pure and proper idea of materialism, divested of all unnecessary
consequences. Thirdly and lastly, the name is applied to
systems like that of the ancient Epicureans, or of Spinoza,
which deny both a future state of rewards and punishments,
and a Divine Creator, systems for which atheism would be
the better name, insomuch as materialism fails to denote
their more important and distinctive indications.

The following is a brief summary of the views of Dr.
Priestley, who has been the most decided exponent of
materialism, and expounded the principles of materialism in the pure and pro-
per sense of the word. He denies the existence of a sepa-
rate immaterial principle in man, called the mind or soul,
because he thinks that an immaterial principle could not
exist in a material body, and consequently that all mental phenomena (as they are called) may be
explained by means of supposed movements arising out of
the bodily organization. The method by which he thus
explains mental phenomena is that of Hartley. (Hartley.)
Adopting this philosopher's hypothesis of medullary vibra-
tions, he defines mental phenomena as medullary vibrations
perceived; and he contends, principally from the analogy
of brutes, that bodily organization is adequate to produce
the same effects by means of vibrations, and he dispenses
with the hypothesis of a separate immaterial soul.

But denying the existence of a soul, separate from the
body, and capable of surviving when the body perishes,
he does not yet deny the immortality of man, and a future
state of rewards and punishments. On this head, he distinctly affirms these on the authority of Scripture. It is
needless to add that Dr. Priestley does not deny the exist-
ence of a God. [Priestley.]

One word more on the absurdity of coupling the denial of
the principle of an immortal soul, and of
making atheism synonymous with materialism. To deny
that a material soul is necessarily to deny an immortal soul, but
not therefore to deny an immortal man. And even to deny
the existence of everything else, material or immaterial, is
not necessarily to deny the existence of a principle, as is shown
by many of the ancient schools of philosophy (Ekleatic Philo-
osophy), nor even to deny a moral Governor, as is shown
by the philosophy of Hobbes, who, denying in one part of
his writings the existence of all spirit, and in this respect carrying his views further than Dr. Priestley, yet makes God the cornerstone of moral and political science. [Hobbes:]

Hobbes distinctly says that there being nothing, in his opinion, but matter in the universe, it follows that God is not.

But it is to be remarked in opposition to materialism, even as it is put forth by Dr. Priestley, that it is devoid of philosophical foundation, and rests on a disregard of the limitations which are imposed by its truth. It rests altogether on hypothesis and conjecture. When we go beyond what are called the qualities of the mind, or... no help but in supposing and conjecturing and imagining. Such speculations may doubtless be interesting, and they may have their use too as an exercise for the imagination, but we cannot calculate upon their results. Much mischief is done moreover by mixing up these results with the results of observation, by jumbling together conjecture and philosophy. The true philosopher, not desiring, but setting aside as irrelevant to his object, all speculations on the origin of the mind, or of the soul, will, if he either, will from these as first principles, and will apply himself to observing their qualities and capabilities and laws; and the results will be sound psychology and sound physics.

The converse of the word materialism is immaterialism. This is an abstract term, even in its purest form, and even thus very seldom; spiritualism being generally used in its place.

MATERIALS, STRENGTH OF. The strength of any material object, as a rod, a bar, beam, chain, or rope, is that power by which the substance resists an effort to destroy the integrity of the body. It evidently depends on the disposition of the particles relatively to each other, on the intensity of the force by which the particles cohere together, and on the manner in which the straining power is applied. The inquiry into the laws by which the materials employed in the construction of machines resist or maintain the forces to which they are subject is of considerable importance, because upon a just adaptation of the strength at any one point to the strain there experienced (and an excess or deficiency of the former is nearly equally injurious) depends the stability of the whole.

Whatever be the constitution of a rod or beam, the relation between its strength and the strain to which it may be exposed can be made the subject of mathematical investigation only by supposing the material to consist of an infinite number of particles arranged in lines (like fibres or threads) parallel to each other in the direction of their length. The particles in each line must be supposed to cohere together by powers exerted in that direction; and the several lines are supposed to resist the force which may, or may not, be equal to those exerted longitudinally. In homogeneous bodies, as glass and some of the metals, the particles may be supposed to be symmetrically disposed throughout the mass, so that the strain may be such as to cause the separation of the particles in every direction with equal powers; but the case is different in other bodies, particularly in timber; and here, in the lateral cohesions of the fibres are much less powerful than the longitudinal cohesions of the particles in each fibre. In ropes the fibres have no lateral cohesion, and the strength depends upon the twisting of the fibres together; in consequence of this, as the latter can scarcely be separated from each other in the direction of the length of the rope, the cohesion of nearly all the particles in any transverse section must be destroyed before a disruption can take place.

A rod of any material, consisting of parallel fibres as above supposed, being placed in a vertical position, and strained by a weight applied at the lower extremity, the particles in the upper part will be separated from each other by the action of the weight, and consequently its length will be increased. The cohesive power by which the particles are kept together will, in most cases, be diminished by the separation; and if the weight be sufficiently great, or if by allowing a sufficient length of time, the cohesive power will certainly overcome; that is, the rod will, in some parts of its length, be torn asunder. But before this occurs, since all bodies possess a certain degree of elasticity, on removing the weight the attraction of cohesion will cause the separated particles to return towards their original positions; and the rod will become nearly of the same length as at first. That it does not exactly become so, in general, arises from the imperfect elasticity of the material, on which account the particles come to a state of rest at augmented distances from each other. The elongation of the rod when strained by a weight, and the amount of the weight necessary to produce fracture, will depend on the nature of the material; and, in a want of uniformity in the constitution of materials even of the same kind, though the rods be of like dimensions, great irregularities are found to exist in their power of resisting direct strains. Numerous experiments performed at public exhibitions have shown that the different kinds of material can alone afford a mean value on which reliance may be placed when it is required to determine the capability of a bar or beam to resist the strain arising from the action of any given force.

If the rod were perfectly elastic, so that the length of the rod became the same, after the removal of the suspended weight, as before that weight was applied, the force of cohesion would evidently be proportional to the intensity of the straining power; and this is generally adopted as an hypothesis in investigations concerning the equilibrium between strengths and strains; it being understood that the latter have only that moderate degree of intensity, compared with the former, which is consistent with the permanent stability of the piece of material. As just mentioned appears to have been discovered by Dr. Hooke; and, as the separation of the particles in any fibre is proportional to the straining power, it follows that, within certain limits, the cohesive power between two particles of an elastic body is proportional to the distance to which one of them is removed by the straining force from the place where it was before at rest. The same law is considered to hold good when the particles of an elastic body are made to approach each other by the action of a compressing force like that of a weight.

The power by which the particles in any body resist the action of a force tending to separate those particles in the direction of the length of the body may be considered as constituting the direct or absolute strength; and it is evident that, if the body were of a homogeneous texture, that strength would be proportional to the number of particles in a transverse section; that is, to the area of such section, while the strain is proportional to the weight applied. Therefore, if A represent the area and W the weight applied, including that of the body itself, we should have F = W W when the strain and section are in equilibrium. This formula for the absolute strength of a material is considered as nearly correct with respect to most of the bodies in nature: and hence (F being determined by experiment) the strength by which a rod of any material resists this kind of strain may be found when the dimensions of the rod are given. For example, if we have determined the experimentally the values of F, the reader must be referred to the extensive tables which have been published by Barlow (Essay on the Strength of Timbers); Rennie (Phil. Trans. 1818); Tredgold (Principles of Civil Engineering); and Hodgkinson (Mechanics, etc., vol. iv.), our limits permitting us to introduce only the few determinations which follow.

The area of a transverse section of each rod is one square inch, and the values of F are expressed by the breaking weights in poundsavoirdupois.

<table>
<thead>
<tr>
<th>Material</th>
<th>F (in pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>English oak</td>
<td>8,000 to 12,000</td>
</tr>
<tr>
<td>Fir</td>
<td>11,000 to 13,480</td>
</tr>
<tr>
<td>Beech</td>
<td>11,500</td>
</tr>
<tr>
<td>Mahogany</td>
<td>8,000</td>
</tr>
<tr>
<td>Teak</td>
<td>12,000</td>
</tr>
<tr>
<td>Cast-steel</td>
<td>134,256</td>
</tr>
<tr>
<td>Iron wire</td>
<td>93,564</td>
</tr>
<tr>
<td>Swedish bar-iron</td>
<td>72,061</td>
</tr>
<tr>
<td>Carbon steel</td>
<td>18,566 to 19,409</td>
</tr>
<tr>
<td>Wrought copper</td>
<td>2,167</td>
</tr>
<tr>
<td>Platinum wire</td>
<td>52,567</td>
</tr>
<tr>
<td>Silver</td>
<td>38,257</td>
</tr>
<tr>
<td>Gold</td>
<td>30,968</td>
</tr>
<tr>
<td>Zinc</td>
<td>19,304</td>
</tr>
<tr>
<td>Tin</td>
<td>7,129</td>
</tr>
<tr>
<td>Lead</td>
<td>3,146</td>
</tr>
<tr>
<td>Rope (1 inch circumference)</td>
<td>1,000 lb, F = 12,566</td>
</tr>
<tr>
<td>Whale-fine spun by hand</td>
<td>2,240</td>
</tr>
<tr>
<td>Wild (1 inch circumference)</td>
<td>7,037</td>
</tr>
</tbody>
</table>
weights which those bars will sustain without bending are inversely proportional to the squares of the lengths.

It is also found, if $w$ be a weight applied as above, and producing a flexure $p$, measured at the middle of the bar perpendicularly to its length, that $\delta = \frac{4w^4}{E_I}$. This being substituted in the expression for $W$, the latter becomes

$$W = \frac{\pi w^4}{3P}.$$  (Ibid., No. 314.)

The most important inquiry concerning the strength of materials is that which relates to a beam or bar supported at its extremities on two props, and strained transversely by a weight acting perpendicularly to its length at a given point between the props.

In order to simplify the investigation, it is usual to imagine that the beam, its breadth and depth being supposed uniform, is made to rest on one prop at the place where the weight may have been applied in the former case, suppose in the middle of its length, and that from the points where the two props were situated weights of the same kind were exerted on the beam to the reactions of those props in consequence of the first weight; that is, to half the whole weight in the middle.

Then, supposing the deflection of the beam to be very small, if, conversely in the former case, the beam did not slide on its props and if the two weights to break the beam on its single prop will be the same as that of the one weight applied as at first supposed. Again, if a beam of equal dimensions with respect to breadth and depth were placed on at one end but having a wall, the part projecting from the face of the wall being equal in length to half that of the former beam; and if a weight were applied at the opposite end equal to each of the two weights applied to the beam on one prop, the effect of this weight to break the beam at the face of the wall will be equal to that of the two weights to break the beam on the one prop, or of the double weight to break the same beam on two props.

The investigation for the case at first supposed is therefore reduced to that of finding the strength of a beam attached at one end to a wall, and strained by a weight at the opposite extremity.

**Fig. 1.**

Let $A B$ (fig. 1) be the face of a wall, and let $M N$ represent a vertical section of the beam in the direction of its length. Let it be supposed that the beam consists of an infinite number of fibres parallel to $M P$; then, if these fibres were supposed to be rigid and incompressible, the effect of a weight at $P$ would be to bring the beam to an inclined position, as $M n$, producing a fracture on the line $M Q$ by drawing the particles on that line away from those which were at first nearly in contact. From the experiment it is found that, when a beam is so strained, while the upper fibres are in a state of tension, the lower ones are in a state of compression; and consequently there is a certain point $O$ in the depth of the beam at which neither of these effects takes place. A line passing through this point perpendicularly to the plane $M N$ is therefore called the neutral axis of the beam, and the termination of the fracture may be supposed to be at $O$ instead of $Q$; the fibres below the former point having no effect in altering the tendency of those above to break, just constituting part of the strength of the beam by the power with which they resist compression, and thus oppose the tendency of the beam to turn about the neutral axis. The position of the neutral axis is uncertain; but Mr. Barlow, from experiment, has found that in rectangular beams of wood (the faces being in vertical and horizontal positions) its distance from the upper surface at $M$ bears to the whole depth $M Q$ the ratio of $1$ to $1 + \frac{d}{4}$, or nearly that of $d$ to $11$. Therefore, $d$ representing the depth $M Q$, let $O M$ be represented by $\frac{4}{11}d$.

Now adopting the hypothesis of Leibnitz, which is founded Vol. XV.—C
on the elasticity of the fibres, that the force of cohesion in any one fibre is proportional to the tension to which it is subject, or to the distance of that fibre from the axis about which the beam turns in consequence of the strain; that is, from the neutral axis just mentioned; if \( x \) be the distance of any fibre above \( O \) from the latter plane and \( f \) represents the force of cohesion in the fibre at \( M \), we shall have
\[
\int_{x}^{11} f dx \quad \text{and the last term will express the force of cohesion between two particles at a distance above \( O \) equal to \( x \).}
\]
Consequently, \( dx \) expressing the indefinitely small depth of a fibre, we have \( f dx \) for the cohesive power of a fibre at the same place. But this power acting at a distance from \( O \) equal to \( x \), we have \( \frac{11}{4d} x dx \) for the momentum of that force, and its integral will express the strength of all the fibres in the vertical section represented by \( M \). The transverse section of the beam being supposed to be rectangular, the breadth will be constant; let it be represented by \( b \); then the integral of \( \frac{11}{4d} x dx \) (between \( x = 0, x = \frac{1}{2d} \), that is, nearly \( \frac{1}{23} \) of \( 11 \), or nearly \( \frac{1}{23} b^2 d f \) will express the strength by which all the fibres above the axis at \( O \) resist the strain.

A corresponding expression for the strength arising from the resistance of the fibres below the neutral axis to the force of compression would be the integral of \( \frac{11}{7d} x dx \) (between \( x = 0, x = \frac{7}{23} \), that is, nearly \( \frac{1}{23} b^2 d f \) ("being the force by which a fibre at \( Q \) would resist compression), and the sum of the two integrals will be the whole strength of the beam to resist a transverse strain. Now the ratio of \( f \) to \( f' \) is different in different materials; and if we take \( f' = \frac{1}{2} f \) (which is the case in some kinds of wood), the said sum will be \( \frac{1}{2} b^2 d f \) nearly.

But when the beam is strained by a weight \( W \) applied at \( P \), so that it takes the inclined position \( mN \), if we join \( O \) and \( p \), and let fall the perpendicular \( pR \) on \( AB \), we shall have \( W, pR \), or if \( f \) be the length of the beam \( W, l \cos \theta \), for the moment of the weight. Then \( W, l \cos \theta \) is \( \frac{1}{2} b^2 d f \) becomes the equation of equilibrium, \( W \) representing the weight which will just break the beam; and when \( pR \), or the deflection, is small, its cosine may be considered as unity. It follows that the strength by which beams of the like material resist this kind of strain \( b^2 d f \) will vary as \( \frac{1}{l} \).

If a perfectly elastic beam or bar were attached horizontally at one end to a wall, and were strained by a weight \( W \) at the other end, the mathematical theory would give for the deflection of the opposite end of the beam (that is, the distance to which this end would be drawn in a vertical direction from the original position of the beam) \( \Delta = \frac{Wl^3}{3AE} \) (Poisson, Mécanique, tom. i., No. 310), where \( A \) is the area of deflection; \( l \) is the length of the beam; \( E \) is the area of the transverse section; \( d \) is the depth; and \( E \) is the element of deflection. Therefore, if \( a \) be found experimentally on a beam or bar in which \( W, l, d, a, \) are given, we may from this equation obtain \( \Delta \); and subsequently the value of \( A \) for any beam, the materials being of the same kind. Again, the strength of power by which a beam fixed at one end to a wall is divided in the direction of its length is expressed by \( b^2 d l \) (ib. No. 308, where \( D \) is the element of distortion. Now, if \( W \) be the weight which would produce the deflection \( \Delta \) and distortion \( D \), we shall have
\[
\frac{w}{d} = \frac{1}{\omega d} = a^2 ;
\]
and the first member of this equation being substituted for its equivalent in the above expression for \( \Delta \), the latter becomes \( \Delta = \frac{Wl^3}{3AE} \); or since the elongation of the whole beam is proportional to the length, and may be represented by \( D \); if we put \( E \) for this elongation when \( w = W \), we shall have \( \Delta = \frac{Wl^3}{3AE} \).

Whence the elongation of an elastic rod by a weight or power acting in the direction of its length is to the deflection of the same rod by a weight or power acting perpendicularly to its length, as the square of the depth or thickness is to the square of the length.

The relations between the strength and strain when a beam or bar, as \( M \), in the preceding figure, is fixed at one end in a wall, and when a beam, as \( P \) in the annexed diagram (fig. 2, of equal dimensions with respect to breadth and depth, but twice as long, is supported on a prop at its middle point (the weight at each extremity of the latter being equal to that of the extremity of the former), are the same. Also the angle \( VOP \) of deflection (\( O \) being in the direction of \( PO \) produced), when a beam is supported on a wall, is at right angles to \( QO \) or \( pR \), or nearly \( \frac{1}{3} \) of the force figure (\( O \) being drawn perpendicular to the wall, or parallel to the horizon, and the beam \( MN \) being equal in every respect to one of the half-beams on the prop). For the angles \( MO \) are equal in both cases; since the weight \( W \) is put on the beam in the same way that \( PO \) is placed on the wall; and it hence follows that the angle \( HOP \) of deflection, with respect to the horizontal line \( HH' \), will be equal to only half the angle \( HOP \). The same relation subsists between the deflections when the beam \( PM \) is supported on the middle of the beam, nearly.

It will follow, from what was first stated, that a beam attached at one end to a wall in a horizontal position will bear suspended from the other extremity only half the weight which the same beam would bear, if its middle point were made to rest loosely on the two props. If the ends of the beam were prevented from rising on the props, the strength would, on account of the additional weight necessary to produce deflection or fracture at each end, be increased in the ratio of \( 3 \) to \( 2 \) nearly.

The following table contains a few of the results obtained from experiments made by Messrs. Banks, Barlow, and Tredgold, on wood and iron, when supported loosely on props and subject to a transverse strain in the middle point. In the second column \( B \) contains the length of the beam in feet; the third, the areas of the transverse sections in square inches; the fourth, the breaking weights in pounds; and the last, the deflections at the middle points in inches.

<table>
<thead>
<tr>
<th>Material</th>
<th>B</th>
<th>A</th>
<th>W</th>
<th>( \Delta )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Young oak</td>
<td>9</td>
<td>4</td>
<td>15</td>
<td>1.69</td>
</tr>
<tr>
<td>Ship timber</td>
<td>23</td>
<td>1</td>
<td>264</td>
<td>1.5</td>
</tr>
<tr>
<td>Oak (English)</td>
<td>7</td>
<td>4</td>
<td>637</td>
<td>8.1</td>
</tr>
<tr>
<td>New England fir</td>
<td>7</td>
<td>4</td>
<td>420</td>
<td>4.66</td>
</tr>
<tr>
<td>Rigs fir</td>
<td>7</td>
<td>1</td>
<td>212</td>
<td>1.3</td>
</tr>
<tr>
<td>Tone</td>
<td>7</td>
<td>1</td>
<td>203</td>
<td>4.6</td>
</tr>
<tr>
<td>Cast-iron bars</td>
<td>3</td>
<td>1</td>
<td>756</td>
<td></td>
</tr>
<tr>
<td>Ditto</td>
<td>3</td>
<td>1</td>
<td>869</td>
<td></td>
</tr>
</tbody>
</table>

Since the strengths of beams attached at one end or supported on props, the other dimensions being the same, vary as the square of the vertical depths, it follows that the most advantageous position, when the areas of the transverse sections are equal, is that in which the broadest surface is in a vertical position. In this manner girders and joists in either case, and invariably placed.

When a beam or bar is attached at one end to a wall, or when it turns upon its middle point like the great lever of a steam-engine, if it be required that the beam should be equally strong in its whole length, it should be made so. For when the beam is constant, the breadth at any point should be proportional to its distance from the extremity. When the breadth is to be constant, the vertical face of the beam should have the form of the common parabola; and when both breadth and depth vary, the longitudinal section of the beam should have the figure of that which is called a cubical parabola.

If a weight be applied at any point in the length of a beam, which is supported on two props, the strain produced by it will be the greatest when it is placed in the middle, and the strain varies as the product of the distances of the weight.
MAT

from the points of support. For let \( A B \) (fig. 3) represent

\[
\begin{align*}
P & \quad A \quad B \\
C & \quad P
\end{align*}
\]

a beam supported at \( A \) and \( B \), and let \( C \) be any point in it. Imagine a weight \( W \) to be applied at any point \( P \); then, by the nature of the lever, \( A'B \); \( P'B \); \( W' \); the pressure exerted by \( W \) on the point \( A \), viz. \( \frac{AB \times W}{W} \); and this term expresses the reaction of the prop at \( A \) in consequence of the weight \( W \) at \( P \). Then also \( \frac{AB \times W}{W} \) is equal to the strain at \( C \) produced by this reaction. Again, imagine a weight \( W' \) to be applied at \( P' \); then we shall have, as before,

\[
\begin{align*}
AB & \quad P'A \quad W' \\
\frac{W' \times P'A}{W} & \quad \frac{W' \times BC}{W} \\
& \quad BC
\end{align*}
\]

and this last term expresses the reaction of the prop at \( B \) in consequence of the weight \( W' \) at \( P' \): also \( \frac{AB \times W}{W} = \frac{AB \times W'}{W'} \). If \( P \) and \( P' \) coincide with \( C \), we have \( P'A = AC, P'B = BC \); and the sum of the two strains is equal to \( \frac{AC \times BC}{AB} \); or, putting \( W' \) for \( W + W' \), we have the strain at \( C \) in consequence of the weight \( W' \) placed there,

\[
\frac{AC \times BC}{AB}.
\]

If a weight be diffused over a beam which is fixed at one end to a wall, it may be considered as acting at its centre of gravity, which, if the beam be uniform, will be in the middle of the length of the beam. The momentum of the strain will consequently equal half of that which would result from an equal weight attached to the opposite end.

When a body is compressed in a direction perpendicular to the length of the fibres, the points of support being very near and on opposite sides of the place at which the force is applied, the strain to which the body is then subject has been called by Dr. Young the force of destruction. This species of strain sometimes occurs in the construction of machinery; but few experiments have yet been made to determine the strength by which materials resist it. From these however it appears that the strength is proportional to the area of the transverse section, and that it varies from four-thirds to twice the strength by which the same material would resist a force acting in the direction of the length.

Such machines as capstans and windlasses, also axles which revolve with their wheels, are, when in action, subject to be twisted, so that their fibres tend to become curved in oblique directions; and the strain thus produced is called that of torsion. The most natural way of investigating the strength of materials to resist this kind of strain is probably that which was adopted by Dr. Robison: this mechanic imagined the cylindrical body to be composed of an infinite number of concentric hollow cylinders inserted in each other; and, supposing the whole to be cut by a plane perpendicular to the axis, he conceived that two particles in the circumference of any one of the concentric circles would resist the effort to separate them, by a force proportional to the distance from the common axis. Hence, if the radius of the whole cylinder be \( r \), and that of any one of the internal cylinders be \( x \); also, if \( F' \) represent the force of cohesion between any two particles in the outer circumference, we have

\[
F' = F'' = \frac{\tau}{r} \times x
\]

The last term expresses the like force in the circumference of the cylinder, whose radius is \( x \), and the momentum of cohesion is \( \frac{\tau}{r} \). But as all the particles in that circumference exert the same power, and the number of particles is proportional to \( x \), it follows that

\[
\frac{F'}{r} = \tau \times x\,dx
\]

will represent the sum of all the forces in the latter circumference, and \( \frac{F'}{r} \times x\,dx \) will represent the sum
MATHEMATICAL REASONING IS USEFUL AND INTERESTING, AND, AS A SAFEGUARD, EVEN NECESSARY. IT IS NOT LONG SINCE A SCHOOL OF MATHEMATICAL REALISM EXISTED, WHO IMAGINED THAT BECAUSE ALL MATHEMATICAL DEFINITIONS ARE PRECISE, EVERYTHING ELSE IS UNIQUELY DETERMINED. IT WAS NOT TO THEM A NECESSARY RESULT OF THE CONSTITUTION OF OUR FACULTIES THAT THE THREE ANGLES OF EVERY TRIANGLE MAKE UP THE SAME AMOUNT, BUT A CONSEQUENCE OF DEFINITION, WHICH MIGHT HAVE BEEN OTHERWISE. IT IS TRUE THAT紋 can hardly undertake to explain what we do not understand, but we recommend every beginner in the subject to seek no knowledge about the character of fundamental propositions until he shall have become well acquainted with their meaning, and has not only memorized them, which is not, or cannot be made, most evidently true; and he will find that all axioms, as they are called, have the highest sort of certainty, namely, that they cannot be imagined otherwise. Whatever may be the metaphysical hypothesis to which it is referred, it is certain that there is a real distinction between a mathematical assertion and one of any other kind. If we say that an unsupported bit of lead will fall to the ground, we state a fact of experience; to methodize the two straight lines cannot enclose a space. But in the former proposition, an exception, or even a permanent alteration of the law, is conceivable by the imagination: in the latter that the straight line is capable of being regarded as a base and the semicircle as a figure, in which case the idea of enclosure is limited by only two straight lines. No distinctive phrases can be too strong to express the essential difference of these two assertions; but it is a misfortune that all terms which create a sufficient divination of the nature of things in a general observation of the mode of thinking. If the mathematical student can receive these terms as indicative of the difference of species, without boding before an hypothesis about the conformation of his own reason, he will do well to adopt them; if, on the other hand, we are compelled to agree with any one system of mental philosophy, he will neither impede nor advance his mathematical career.

The sciences of which we speak may be considered either as disciplines of the mind, or as instruments in the investigation of nature and the advancement of the arts. In the former point of view their object is to strengthen the power of logical deduction by frequent examples; to give a view of the difference between reasoning on probable premises and on certain ones, by the construction of a whole body of results which in no case involve any of the uncertainty arising from the previous introduction of that which may be false; to form the habit of applying the attention closely to difficulties which can only be conquered by thought, and over which the mind is certain; to be thus led to establish confidence in abstract reasoning by the exhibited processes of whose results may be verified in many different ways; to help in enabling the student to acquire correct notions and habits of generalization; to give caution in receiving that were so-called with phenomena; to instil a correct estimate of the powers of the mind, by pointing out the enormous extent of the consequences which may be developed out of a few of its most inherent notions, and its utter incapacity to imagine, much less to attain, the boundary of those of the meaning of expressing thought, and to make apparent the advantages of system and analogy in the formation of language and symbols; to sharpen the power of reasoning by frequently engaging not combinations of the resources of thought; to enable the historian to look at men of different races, opinions, and habits, in those parts of their mind where it might be supposed a priori that all would most nearly agree; and to give the student a command over any subject of interest cannot lay down premises or deduce conclusions.

As instruments in the investigation of nature and the advancement of the arts, it is the object of the mathematical sciences to give correct habits of judgment and ready means of expression in matters involving degree and magnitude of all kinds; to teach the method of combining phenomena and ascending from the complicated forms of manifestation to the simple law which regulates them; to trace the necessary consequences of any law, assumed on suspicion, in order to correct those consequences; to construct hypothetical representations of laws, or approximations to laws, which shall sufficiently represent phenomena; to convert processes of known accuracy, but complicated operations, into others which make up in simplicity for a certain amount of inaccuracy, and to devise means for judging of the amount of inaccuracy, and confining it within given limits; to ascertain in advance the probable result of observations or experiments which are discordant with each other either from errors of measurement or unknown causes of disturbance; to point out the species of experiments which must be made; to determine the rate of increase or decrease of information, or to decide between two laws which existing phenomena both indicate as of nearly equal credibility; to make all those investigations which are necessary for the calculation of results to be used in practice, as in naval economy; to determine the point of contact not necessarily, but to determine from money transactions; in a word, though that word by itself would have not presented a sufficiently precise idea, to find out truth in every matter in which nature is to be investigated, or her powers and those of the mind to be applied to the physical progress of the human race, or their advancement in the knowledge of the material creation.

The main branches of mathematical science were formerly stated to be arithmetic and geometry, springing out of the simple notions of time and space. This is too limited a description. Unquestionably number, magnitude, and space, strictly and demonstratively treated, and that of geometry, or the deduction of the elementary properties of figure from definitions which are entirely exclusive of numerical elements, and the true nature of foundations, but not as the ultimate divisions, of mathematics. To them we must add the science of operations, or algebra in its widest sense,—the method of deducing from symbols which imply operations on magnitude, and which are to be distinguished from mere collections of nouns and verbs by the aid of definitions. The leading idea of this science is operation or process, just as number is that of arithmetic, and space and figure of geometry: it is a more abstract and refined character than the latter two, only because it does not immediately appeal to our senses and habits which are formed in the common routine of life. It is the most exact of the exact sciences, according to the idea of their exactness which is frequently entertained, being more nearly based upon definitions than either geometry or arithmetic. It is true that the definitions must be such as are well adapted to the application to number, space, force, time, &c., or the science would be useless in mathematics, commonly so called; but it is not the less true that a system of methods of operation, based upon general definitions and conducted by strict logic, may be made to apply either to arithmetic or geometry according to the manner in which the generalities of the definition are afterwards made specific.

The common division however of the mathematical sciences which we have separated in the preceding description, the science of operation being more or less mixed up with arithmetic in common algebra, and in its application to geometry. We may describe this division as follows:—

1. Pure Arithmetic, subdivided into particular and universal. It is the former, the common science of numbers, which admits or does not admit of any character of symbols, and which restricts itself entirely to the science of operations, or algebra in its widest sense, as an extension which frequently requires a higher algebra.

2. Pure Geometry, which investigates the properties of the figures in the plane of a figure, in particular, which confine the student to the straight line and circle as the means of operation and the boundaries of figure. [Geometry, p. 153.] This science includes solid geometry, as far as figures bounded by planes, the properties of the sphere, cone, cylinder, and other figures, and it does not allow any conic section, except the straight line and circle, to be employed in the solution of problems.

3. Algebra, including the general calculus of operations (though this is not an elementary branch), and all methods which can be applied to the solution of conic sections exclusively belonging to the differential calculus. The distinction between it and universal arithmetic is an extended use of operations, preceded by an extended definition of their meaning.

We have used the word particular, as opposed to universal; algebra was sometimes called universal arithmetic, but the phrase never became general, owing to the being obvious to those who studied algebra, that arithmetic, however general its symbols may be, is only a particular algebra.
4. Application of Algebra to Geometry.—This includes trigonometry, and all those parts of geometry in which problems are numerically solved, and the method of Euclid is abandoned. Algebra includes sections as complex as analytical; and in its higher parts is an application of the differential calculus, as well as of algebra.

5. Differential and Integral Calculus.—Under this term we include the general theory of limits, that is, all digested methods of logic, which are used in the comparison of algebraical quantities under specific symbols. This distinction is necessary, since the notion of a limit, and even propositions which belong to the differential calculus in everything but form, are contained in the elements of Euclid. The differential calculus is the study of the change of quantity.

The calculus of differences and the calculus of variations are usually placed under this head: the former, in its elementary parts, might be referred to common algebra; the latter is an extension of the former.

The division of the mathematical sciences into pure and mixed is convenient in some respects, though liable to lead to mistakes. By the former term is understood arithmetic, geometry, and all the preceding list; by the latter, their application to the sciences of mechanics, optics, &c.

But considering that in all these subjects a few simple principles are the groundwork of the whole deduction, they might be explained as intended to answer two distinct questions: first, what are the consequences of the assumptions in the matter of matter? secondly, are these consequences found to be true of matter as it exists, and are the assumptions therefore to be also regarded as true? In the reply to the first question, the science is wholly mathematical; to the second, it is not mathematical, but inductive, and relative to specific domains and industries.

Thus, for example, there are the mixtures of which the joint answer to both questions derives its name, and not from any difference between its mathematics and those of the pure sciences. Again, a science does not take the same form of the same method of propositions as the laws of mechanics.

The words in question should be reserved to denote those branches of inquiry in which few and simple axioms are mathematically shown to be sufficient for the deduction, if not of all phenomena, at least of all which are most prominent. Taking the leading ideas of the mixed sciences instead of their technical names, we may describe them as relating to motion, pressure, resistance, light, heat, sound, electricity, and magnetism. As disciplines, it is their main object to teach the method of investigation first, and so far as can be known, the causes, of material phenomena; as instruments, it is necessary to say one word about them. Two only have not been mentioned: the first, astronomy, which belongs to more than one of the preceding disciplines; the second, the theory of probabilities, in which, though placed among the mixed sciences, it may be doubted whether its proper place is not in the first list.

The most important question connected with the mathematical sciences is the manner in which they should be taught as disciplines of the mind. This concerns all who consider any branch of knowledge in that light; and, as education spreads, this view of the subject will become more and more consequence. Vitaly essential as these sciences are to the pursuit of the arts of life, we feel in regard to this branch of their utility, the necessity of indicating to those who know that they must and will be attended to, because their cultivation is necessary to the supply of wants which all can feel, and the promotion of interests which all can understand. The ratio of number of students in any subject of their study, but rather the reverse; for the wants of life being as easily supplied by the results of an illogical as of a logical system (provided only that vicious reasoning be not allowed to produce absolute falsehood), the faculties which habit of reasoning affords in the mere attainment of results will always recommend it to those whose major object it is to apply the fruits of calculation to the uses of life. Such has been, and, we are afraid, will continue to be, the tendency of the great advance which the last century made in this.

All we should positively contend for is the necessity of making the entrance to the study as strict and rigorous as reason can make it, to all who are to receive liberal education. In the higher branches of mathematics many opinions prevail, and it would be impossible to make a formal standard of rigour. Add to this too with a certain degree of experience in the estimation of reasoning must in the outset on the admitted immaterial which of several different methods is adopted; either may be rigorous if properly understood, and if the habit of reducing looseness of phraseology, or dangerous abbreviation, or denial, and deduction, than can be obtained from previous education as now given: this to be done by the study of the elements of logic.

Secondly, there is no consideration of facility or practical convenience to prevent the first study of arithmetic and geometry from being strictly demonstrative, and formally rigorous: rigour being defined to consist in explicit statement of every assumption, and logical treatment of the latter.

On the first of the preceding recommendations we shall only observe, that in order to distinguish between accurate and inaccurate inference, an acquaintance with the exact extent of meaning of the several modes of communication is absolutely essential. In the common course of elementary use of language, which abounds in implications to be suggested by the circumstances of the speaker, the context of the words, or the tone in which they are delivered, before the phrases of demonstration can be made to convey meaning, and the meaning being necessarily different in different phrases, must be made a study; if this be neglected, the words of any book may pass between the teacher and the learner, but no precaution has been taken to secure their conveying the proper meaning, neither too much nor too little.

On the second, that it is impossible for us to doubt that we hold many points of controversy very cheap, as far as they concern the discipline given by the most elementary branches of mathematics. It matters nothing, in our view of the case, if the demonstration is really incapable of proof, or whether the substitution of another would or would not place the science on a more simple basis. The habit to be formed is that of tracing necessary consequences from given premises by elementary logical steps: the premises to be true or false, the consequences to be true if the premises be true, and dubious (not necessarily false) if the premises be false. The only error which, at the stage in question, is intended to avoid, is the deduction, as a necessary consequence, of that which is not so.

The mind of the learner should be taught to be satisfied with the absolute truth or falsehood of the conclusions, to the neglect of their connection with the premises: hence it arises that when a process occurs in which it is essential to examine that connection for its own sake, it is the universal complaint that beginners think the theory of probabilities, of which, though placed among the mixed sciences, it may be doubted whether its proper place is not in the first list.

Unfortunately for the mental progress of the student, he is often allowed to use premises of an easy form, in cases where a complete preparation for the subject would require more extended first principles and greater proximity of deduction. To this, as before observed, no objection can be taken in itself, provided that no consequences be admitted except those which are perfectly certain. But this supposition is never admitted: the pupil is presented, in considering of his attention to one set of premises, with the consequences of another, and is allowed to make believe that he has come fairly by the latter. Thus, by a theory which applies only to the ratio, he is induced to suppose that whatever the premises may be, the conclusions should really follow; and if that the latter be necessarily of a limited character, the limitation should be stated.

The work of Euclid is preferable, in our opinion, to any system which has been proposed to supply its place; simply because the dependence of conclusions upon premises is more distinct than in any other geometrical writing. The
defects with which it abounds are trifles which can be remedied as they are met with; and though there are seldom three propositions together, one or other of which will not call for some remark from the teacher, yet such is Euclid, that these very faults, properly noted, are of more value than the greater elegance and more artificial process of less formally rigorous writers. Of the part relating to proportion we shall treat in another place.

The necessity of a demonstrative system of arithmetic is practically denied, in this country at least, by the use of a set of dogmatical rules. Such training would be less prejudicial if the notions of the student on reasoning were sought to be provoked, and to be subdued with the better fitting idea of their purpose, and of the extent to which they are to be considered as knowledge. As it is, he has no other view of arithmetic presented to him, and his conceptions of number are allowed to be first fuddled, and afterwards led as a circle, by ideas derived sometimes from the reception of too conventional for the necessary, sometimes from modifications of truth which are convenient in practice though unsound in theory. Such an addition to his stock of mathematical power predisposes him to acquiesce in the shifts by which rigour is avoided; and an arithmetic from which both sequence and accuracy of thought have been excluded is the asylum of geometry against truth, when the latter becomes too difficult for an untrained, that is untrained, power of investigation. An article written on references to works on the history of mathematics, a subject so connected with that of the other sciences, that it would be impossible to say anything in it in few words. The great work of Montucla entitled to his Histoire des Mathématiques, 4 vols., Paris, 1799-1802, is the most accessible source of information for the reader who desires some detail. The bibliography of Murhard, 'Litteratur der Mathematischen Wissenschaften.' Leipzig, 1797, will be found a useful accompaniment in the verification of dates. The work of Kästner, 'Geschichte der Mathematik,' Göttingen, 1796, is more precise in its account of individual labours than that of Montucla, but does not embrace so large a field. The works of Bossut, namely, the 'Histoire des Mathématiques,' Paris, 1782, 'Méthodique' and the 'Histoire des Mathématiques,' 2 vols. 8vo., Paris, 1810, are written in an interesting manner; and the latter (which was translated by Baunoycastre) brings some parts of the history later than its predecessors. Cossali's 'Osservazioni Sull' Idea dei Progressi della Matematica' 2 vols. 4to., Parma, 1796, is an account of the early Italian algebra: its successor in the same subject, 'Histoire des Sciences Mathématiques en Italie,' Paris, 1838, by M. Libri (of which two volumes only have appeared, four more being intended as intended), bids fair to be the most complete work of its kind. For the history and improvements of logarithms, trigonometrical tables may be found in Dr. Hutton's Tracts (3 vols. 8vo., 1812), and in the preface of his Logarithmica, London, 1801. On the 'Découverte du Cercle,' reprinted with additions in 1831, is complete on the subject of which it treats. There is a work on a kindred subject which we have never seen, Reimer, 'Histoire des Progrès de l'Arithmétique depuis 1798,' Paris, 1816, is the least specific of his historical works, but, points of nationality apart, is accurate. Professor Pecock's article on arithmetic in the 'Encyclopædia Metropolitana,' and his report on Analysis, in the second volume of the 'Syllabus,' contain an almost full of historical information of the most precise character. Some notices of early English mathematicians, enough to guide the reader to sources of information, are contained in the 'Companion to the Almanac' for 1637, and in the 'Magasin des Sciences et des Arts' of 1766. The eleventh volume of the 'Memoirs de l'Académie de Paris' contains the 'Aperçu Historique,' &c. of M. Chales, a history of geometry and a complete account of its modern progress.

Among works of older date, which are often cited, we may notice Ward's 'Lives of the Gresham Professors,' London, 1760; Heiblronner's 'Histories Mathesosi Universi,' Leipz. 1742, does not deserve that title, but contains an extensive and, for the time, a very considerable amount of information; G. J. Vossius, 'De quatuor Arithmos publicis,' Amsterdam, 1650, contains a large number of dates and short biographical accounts; to Blancken, 'De Mathematicorum Natur Dissertatio,' Bologna, 1615, is appended a chronologically list of mathematicians up to the time of Galileo; the 'Sciolae Mathematicae' of Peter Ramos, Frankfort, 1627, contains many historical notices. The number of writings which might be referred to as incidentally affording information is of course numerous.

MATHEWS, CHARLES, an eminent comedian, was born on the 17th June, 1776, at the old grammar school in Richmond, Twickenham. His father, Mr. James Mathews, was a bookseller in the Strand, and intended Charles, who was his seventh son, to follow the business. A strong and early inclination for the stage however induced the son, after two attempts to enter a solicitor's office, to take up a footman's place in a private house, the residence of Mr. B. De Coverte in the parts of Richmond in 'Richard III,' and Bowkit in 'The Son-in-Law,' at the Richmond theatre, Saturday, Sept. 7, 1793; and on the 19th of June, 1794, he made his first appearance as a regular comedian at the Theatre Royal, Durlas, Durlas, to the great delight of the audience. The character of Jacob in 'The Chapter of Accidents,' and Lingo in 'The Agreeable Surprise.' In 1797 Mr. Mathews married his first wife, Miss Eliza Kirkham Strong, the daughter of a physician at Exeter. She died at York in 1802; and in 1803 Mr. Mathews was united to his second and surviving wife, Miss Anne Jackson, at that time a member with himself of the York company. On the 15th of May in the same year Mr. Mathews made his first bow to a London audience at the Haymarket theatre, on the 17th of September, 1804, his first appearance at Drury-Lane in the character of Don Manuel, in 'She would and she would not.' On Wednesday, April 12, 1806, at the Theat re co-royal, Hull, he made his first trial of those popular performances, 'The Mail Coach Adventure, or Rambles in Yorkshire.' On the 22nd of July, 1814, Mr. Mathews was severely injured by being thrown out of a tumbler in which he was driving Mr. Terry. The effects of this unfortunate accident made him the last of his line of comedians. On the 2nd of April, 1818, he commenced his extraordinary engagement with Mr. Arnold of the English Opera House, and gave his first At Home in London, an entertainment which he repeated thirty-nine nights to overflowing houses. In 1822 he paid his first visit to New York, and on his return, the following year, and in 1824 produced his entertainment entitled 'A Trip to America.' In January, 1829, he accepted a short engagement at Drury-Lane, and in the autumn of the same year joined proprietor with Mr. Yates of the Adelphi theatre, by his purchase of his deceased friend Mr. Terry's share. In 1834 he again visited America, but was compelled by ill health to return prematurely, having played only thirty nights. On Tuesday, 26th of June, 1835 (his birth-day), he expired at Plymouth, after considerable suffering. Mr. Mathews was a member of the Church of St. Andrew's church in that town. As a comedian Mr. Mathews ranked deservedly high; but his greatest popularity was certainly achieved by his wonderful talent for imitation and imitation, and the unceasing play on kind heart and good taste kept him guiltless of offence even to the most sensitive of those whose peculiarities of voice, manner, or person he so happily assumed. In private life Mr. Mathews was universally respected, and with him the stage lost a perfect gentleman as well as a distinguished professor. His memoirs, partly autobiographical, and edited by his widow, have been recently published in 8vo.
latter are called Lupericas by De Candolle, and are remarkable for their dingy flowers, which are exceedingly fragrant at night, and are well known. M. livida, tristis, and L. odorata are the best known of them, and are frequently cultivated in greenhouses.

MATILDA, or MAUD, Empress. [HENRY L. II.]

MATILDA, Countess of Tuscany. [GREGORY VII.]

MATRASS, a glass chemical vessel, employed for the purpose of digesting, boiling, and distillation, and sometimes while one is used as the body, another serves as the receiver in the last-mentioned operation. Fluorescent flasks are very conveniently described in J. Berzelius, c. 85, sect. 6.) After early marriage, the conviction for unlawful abortion be executed without an award of execution by the court. But when called upon to say whether execution should be awarded against her, the convict cannot plead that she is again with child; such further pregnancy being considered not to be a sufficient ground for suspending, for a second term, the execution of a sentence of death. In such circumstances, punishable for his negligence. But if the ground of the first postponement was the preservation of the infant, there seems to be no reason why the life of the second child should not be sacrificed.

The form of proceeding where a woman alleges herself to be with child by her late husband, which is described in the passage of Bracton already referred to, is evidently taken from the Roman form of proceeding in a similar case, as described in Justinian, tit. 4, De-Inscripto Vercio, custodiendoque Partu.

MATYS, QUINTIN, an eminent painter, born at Antwerp in 1460, is said to have followed the trade of a blacksmith or farrier till he was at least twenty years of age. His quitting his trade to take up painting has been ascribed to different causes. The story that he has gained most credit (perhaps because it is the most romantic) is that he fell in love with a young woman whose father was resolved she should marry none but an artist. At all events he appears to have been in love with the daughter of a grocer, and to have taken her to wife and entered into the church in order to have her introduced to the court of the Emperor. The exact date of their marriage is in doubt; but that he lived in Antwerp in 1509, and that he was there for some years, is certain. He seems to have been one of the most eminent painters of the Low Countries. Though he generally took his subjects from ordinary life, he sometimes ventured with great success on more ambitious works of art. One instance of this is (2) 'Deascent from the Cross,' made for the cathedral of Antwerp, and now in the museum of that city. His most remarkable and best known picture is that of "Two Misers," of which there are numerous copies. The story is told at Wolsey's at Wallingford, and drawings are extremely rare. He died at Antwerp in 1599.

MATTER is the name given to everything which is not dead. Such seems to be the only way of defining the word; and though the definition may appear to assume that the contrary is an impossible thing, it is well known that the class of writers called materialists [MATERIALISM] yet it does not really do so. For whatever theory may be adopted as to the nature of mind, whether it is considered as a separate principle from matter, or merely as a different manifestation of the same, the word mind is indifferently retained; and our definition may consequently be at once reconciled with the materialist theory by paraphrasing it thus:—manner is the name given to the substance of the universe, under all its different modifications, excepting only that one which is known by the name of mind.

Matter then is the name for that out of which all objects external to the mind are thought to be composed, the question being reserved, whether the mind is or is not composed of the same substance. What this substance is, to which the name of matter is given, we do not know, and have no means of knowing. Various speculations have been made as to its nature, and theories formed concerning the manner in which it is thought to act upon the sense organs and the brain. Other speculations have been made as to whether there is such a thing as matter or not; and some philosophers have seen in the solid world around us nothing but a creation of the mind. [BERKELEY: IDEALISM.] There is no question whether any of these speculations. It is sufficient to know and say that man, subject to certain affections of his senses, is led to assign those affections to an external cause. This external cause is that which he calls matter. What that matter is in itself he knows not. He knows only its capability of producing in him certain affections. The ordinary affections of the five senses (sensations, as they are called), and those which give the ideas of extension and resistance. Thus, having already supposed something without, he pronounces these to be qualities of that something; ignorant all the while what that something is, and knowing it only as the substratum of the qualities.
MATTHEW, the Apostle and Evangelist, was a native of Galilee, and a publican or collector of customs and tribute under the Romans. While employed in his office at the city of Capernaum, he was called by Christ to follow him (Matt. x. 9), and was afterwards chosen to be one of the apostles (Matt. x. 3). An account which corresponds in all respects to the conversion of Matthew as related by himself is given by Mark (ii. 14), and Luke (v. 27), though the exact form of the narrative differs in the two gospels. Grosius and others have supposed that Matthew and Levi were different persons, whose conversion took place at the same time; but if so, why should Matthew relate his own conversion and omit all mention of that of Levi? At the three narratives of his conversion to the same time and place, and as Levi is not mentioned among the apostles, nor in any other passage of the New Testament, we may safely conclude that Matthew and Levi are names of the same person. Perhaps Levi was his proper name and Matthew a surname given him after his conversion, as that of Peter was to Simon. The Hebrew word Matthew (מַטתָּו) signifies a gift of Jehovah, from יָדְנוּ, a gift, from יָדְנָה, to give.

In the Acts of the Apostles (i. 13), Matthew is mentioned with the other apostles as remaining in Jerusalem after the ascension of Christ. His subsequent history is quite uncertain. According to Eusebius, an ecclesiastical historian of the fourth century, front. Hist. Eccl. lib. i. c. 19); but according to another tradition, to Ptochis. It has been a commonly received opinion that he was put to death at Nadabara, a city in Ethiopia (Cave's Lives of the Apostles, p. 176), but Heraclius, a Valentinian of the second century, relates that he was burned alive in the copies used by the Nazarenes and Ebonistes, which however were undoubtedly corrupt. The chief arguments on the other side are, that these chapters are contained in all the ancient MSS. and versions, that they are referred to Judea, and quoted so early in the apostolic age, that the particle ἐν, at the beginning of the third chapter shows that something had gone before, and that the style of these two chapters agrees with that of the rest of the Gospel, especially in the manner of quoting the prophecies of the Old Testament.

The general scope of St. Matthew's Gospel appears to be to show that Jesus Christ answered to the character of the predicted Messiah. It has been divided into four parts, as follows:

Part I.—The genealogy, birth, and infancy of Christ. (Chaps. i. and ii.)

Part II.—The preaching of John the Baptist, Christ's baptism by him, and the temptation in the wilderness. (iii. iv. 1—11.)

Part III.—The public ministry of Christ. (iv. 12—xx. 16.)

Part IV.—His journey to Jerusalem, transactions there, his death and resurrection. (xx. 17—xxviii.)

The coincidences and discrepancies between this Gospel and those of Sts. Mark and Luke have been spoken of under Luke's fifth Gospel.

St. Matthew was an Apostle and an eye-witness of the acts of Jesus, at least of those which were done after his call. His narrative has therefore the highest degree of credibility. On this account he was the particular object of attention of the first generation of Christians, and he relates the discourses of Christ with clearness, and often with great energy.


MATTHEW OF WESTMINSTER, one of those valued old writers, the Latin chronicles of England, we have hitherto been so little acquainted with the deeds of the sovereigns and the persons who guided national affairs at a remote period. Matthew spent his life near the antient palace of the kings of England, where the parliaments were usually held and the most important transactions took place; for he was a monk of the abbey of Westminster, the church of the abbey being the usual place of interment of the kings and their families, and still remains to show what a splendid establishment it formed a part. Matthew's date is unknown, but we are certain that he was dead at the death of Edward I. little or nothing is known of his personal history.

He entitles his work 'Flores Historiarum.' He begins with the creation of the world, and the first and least valuable half of it is but half-learned. We find that there were omitted the death of Edward I; little or nothing is known of his personal history.

He begins with the creation of the world, and the first and least valuable half of it is but half-learned. We find that there were omitted the death of Edward I; little or nothing is known of his personal history.
The reign of female sovereigns have usually been favourable to our national history. In the reign of Elizabeth many of our best historians were printed, and of some of them this was the beginning of the reign. Anne, Rymer's great collection of treaties and other important historical documents appeared. Matthew of Westminster was published in London in 1567, and again at Frankfurt in 1601 in the same volume with Florence of Worcesterc. Algar, in the same year, undertook the translation of Matthew to the year 1377, the year of the death of Edward III.

MATTHIAS, Emperor. [HAUSBURG, HOUSE OF; GROSSO, MATTO.] The reign of Frederick, born at Holendede- leben, near Magdeburg, in 1761, was a posthumous child, and brought up by his grandfather, a village pastor, until the age of fourteen, when he was sent to the school at Kloster- bergen, and afterwards to the university of Halle, to study theology. His natural taste however led him to apply himself more to philosophy and general literature. Instead therefore of entering the church, he supported himself for some time as a private tutor at Altona, Heidelberg, and Mannheim, after which he remained for two years with his friend Bonstetten near the lake of Geneva. In 1794 he obtained the appointment of reader and travelling companion to the residing princess of Anhalt-Dessau, and during the next seven or eight years visited Italy, the Tyrol, and parts of southern Germany. In 1806, with the French, and his 'Erinnerungen' furnish many interesting details, besides numerous sketches and anecdotes of distinguished literary persons and others with whom he became acquainted in the course of his tours. Although somewhat deficient in regularity, his method was sufficient to give the writer a lasting reputation. Matthiessen also performed a good office for the poetical literature of his country by his 'Lyrische Anthologie,' a collection in twenty volumes, published at Zürich, 1805-7, and containing select pieces and specimens from 292 poets, commencing with Wackenroder, Zengler, Opitz, and other earlier poets, and terminating with Tiedge. These volumes may be considered as a gallery where the specimens of the different masters are arranged chronologically, and each poet is characterized by a quotation. Matthiessen died at Wetzlar, near Dessau, March 12, 1831.

MATTHIAS (from the Italian mattina, or the French matin, morning), strictly the first part in the daily service of the Roman church. Masses or matins however were divided into four characteristic quartals, which were sung by the choir at Matins. The first or spring quartal lasted from January 1 to March 31, and hours; namely, the nocturn and mattin lauda. The nocturn or vigil were derived from the earliest period of Christianity. We learn from Pliny the younger, as well as from Justin Martyr, Tertullian, and various writers of the first three centuries, that the Christians in those times of persecution held their assemblies in the night, in order to avoid detection. On these occasions they celebrated the memory of Christ's death in the holy mysteries. When persecution had been removed, it would that day have been impossible for them to be able to celebrate their rites, and did administer the sacrament in the day-time, yet a custom which had commenced from necessity was retained from devotion and choice; and nocturnal assemblies for the worship of God in psalmody and reading still continued. The monastic orders, which, in the fourth century, arose under Pachomius, Anthony, Basil, and others, in Egypt, Pontus, and Syria, tended to preserve this custom of nocturnal vigils; and in the following centuries we find, from the testimony of Cassian, how twelve red horehs were sung in each night. The same thing was maintained in most parts of the East and West. In the sixth century, Benedict, the great founder of monastic societies in the West, prescribed the same in his Rule; and nocturnal assemblies were common about that time, especially in monastic churches and monastic lauda, followed next after the nocturns, and were supposed to begin with day-break. We find allusions in the writings of Cyril, and all the subsequent fathers, to the morning as an hour of prayer; but whether there was in the third century any assembly of the church for the purpose of public morning worship is uncertain. However, at the end of the third or beginning of the fourth century there was an asceticism and discipline, turning from the 'Apostolical Constitutions,' where we have the order of the service. (Bingham's Antiquities of the Christian Church, b. xiii.; Palmer's Origines Liturgice, s. v., Oxford, 1832, vol. i.; Apostol. Constit., l. viii, c. 38.) MATTO GROSSO. [BRAZIL.] MATUTA, the name of a genus of brachyrhyncha cras- taceans. [OXYSTOMES.] MATY, MATTHEW, M.D., the son of Paul Henry May, a Protestant minister, was born in Holland in 1745, at Montfort near Utrecht, and was originally intended for the church; but in consequence of some mortifications which his father received from the synod on account of particular theological sentiments, his thoughts, when he grew up, were turned to physic. He took a degree at Leyden: and in 1740 came to settle in England, his father being determined to quit Holland for ever. His earliest patron in England appears to have been Lord Chesterfield. In 1766 he began to publish an account of the productions of the English press, which he printed at Hague, under the name of 'Journal Britannique;' a publication which Gibbon praised, as exhibiting a candid and pleasing view of the state of literature in England for the space of six years. The second volume appeared in 1770. It answered its intention, and introduced Dr. Maty to the most eminent literary persons of the country. In 1756, as soon as the establishment of the British Museum was completed, he was appointed one of the first under-librarians in that institution, which he continued in till 1768. He died of a lingering disorder, on August 2, 1780, and opened, the appearances which presented themselves were considered so singular that they were described before the Royal Society by Dr. Hunter, whose account of them was inserted in vol. xlv. of the 'Philosophical Transactions.' Dr. Maty was an early and active advocate for inoculation; and when a doubt was entertained that a person might have the smallpox, after inoculation, a second time, he tried it upon himself, unknown to his family. Besides various smaller pieces, he published, in 1745, 'Memoires sur la Vie et sur les Ecrits de M. Ab. de Moivre,' 12mo., Hays; 2, 'Authentic Memoirs of the Life of Richard Mead, M.D.,' s. v., London, 1755. At the time of his death he had nearly finished the 'Life of Dr. Gay,' which was completed by his son-in-law Mr. Justamond, and was fixed to that nobleman's 'Miscellaneous Works,' 2 vols. 4to., 1777. Dr. Maty was Lord Chesterfield's executor. (Nicholls's Ann. of Burying; Gibbon's Memoirs, vol. i. p. 87; Biographical Dictionary, vol. xi., p. 485-487.) MAUBEUGE. [NORD.] MAULEON. [PYRENEES, BASSES.] MAUNDY THURSDAY, the Thursday preceding Easter, on which the king or queen distributes alms to a certain number of poor persons at Whitehall; so named from the maunds, or baskets, in which the gifts were formerly contained. It was also called Shere Thursday, as we read in the 'Festival' of 1511; because antiently 'people were wont to wash their bedes and other things on that day, and so make them honest against Easter-day.' The following was the ceremonial of the maundy as practised in 1731. 'Thursday, April 15th, being Maundy Thursday, there was distributed at the Banqueting House, Whitehall, to forty-eight poor men and women (the king's age, forty-eight), boiled beef and shoulders of mutton, and small bowls of ale, which is called dinner; after that, large wooden platters of fish and loaves, viz., undressed, one large old ling, and a large old haddock; and with white herrings; and four half-quarter loaves. Each person had one platter of this provision; after which was distributed to them shoes, stockings, linen and woolen cloth, and leathern bags, with ten pence, twenty pence, halfcrown, and crown, silver, and shillings; to each about four pounds in value. His grace the lord archbishop of York, lord high almoner performed the annual ceremony of washing the feet of a certain number of poor in the royal chapel, Whitehall, which...
was formerly done by the kings themselves, in imitation of Our Saviour's pattern of humility.'

James II. was the last of our kings who performed this ceremony of washing the feet in person. In 'Le Guide de Londres,' the Estrangers, recuili, and composed by F. Colomni, 8vo, Lond., 1693, p. 33, we read, 'Le Jeudy Saint, le Roy, selon un fort ancienne coutume, lava les pieds à tout autant de viellards qu'il a d'âmes; et la Reine de meme à autant de vieilles femmes qu'elle en diana.'

The ceremony was performed at the bapistry, 1642, 1648, and 1659, respectively. After that it was omitted for a time.

The custom of washing the feet had its origin in the East, and was adopted by the Church as a symbol of humility. In the East, it was practised as early as the fourth century. In the West, it was introduced by St. Ambrose, who performed it on Easter Day, and it was later adopted by St. John Chrysostom, who performed it on the Thursday before Easter.

The custom of the maundy is of considerable antiquity. It was called the 'Maundy Thursday' because of the alms which were distributed on that day. The custom was practiced by the early Christian church as a symbol of charity and humility. It was later abandoned in the Western church, but continued in the Eastern church.

Rabbi's 'Glossary,' v. 'Maudn,' Brand's 'Popular Antiquities,' 4to, Lond., 1869, vol. i., p. 124-125; 'Gent. Mag.,' vol. x., p. 172; 'Fox's 'Encyclopedia of Antiquities,' p. 702.)

MAUPERTUIS, PIERRE-LOUIS MAREAU DE, was born at St. Malo, 17 July, 1698. Upon quitting the army, in which he held the rank of captain of dragoons, he applied himself to the study of mathematics and astronomy, partly under the instruction of M. Nicole. In 1723 he was admitted a member of the Royal Academy of Paris, and in 1727 a member of the Royal Society of London. At this time the whole attention of astronomers was directed to the determination of the meridian and to the measurement of the variations of the meridian line. Newton's system of trigonometrical stations upon the islands of the gulf; but upon examination, they found that the valley of the river Torneas

more eligible for the purpose, and, in December following, commenced measuring a base of 7407 toises upon the frozen surface of that river. An account of this survey was published by Maupertuis in 1738: 'La Figure de la Terre,' 8vo, Paris, 1738. The result was that the difference of latitude of the extreme stations, namely, the town of Torneas and the mountain Kittis, was 57° 29' and 6, and that the length of the corresponding arc was 55,623 toises, from which it followed that a degree of the meridian in 66° N. lat. exceeded a toise in 7407 toises, and consequently tended to prove that the earth's figure was that of an oblate spheroid. The survey was repeated in the years 1801-2, 3, by Svanberg, whose results differed from those of Maupertuis.

Maupertuis was one of the first among his countrymen who defended the Newtonian theory against the attacks of Descartes, and when his opinion was confirmed by the result of his survey, he became an open and strenuous opponent of the Cartesian philosophy. When Frederic II. those em- to re-organise the academy of Berlin, he offered the presid-ency to Maupertuis, who, tired of his stay in Paris, where, says M. Delambre, the reputation of many had a tendency to eclipse his own, eagerly assented to so honourable a pro-posal, and fixed his residence in Berlin.

The custom of the maundy is of considerable antiquity. Augustus, according to Du Cange, is first quoted for it. In England at least it was not entirely confined to royalty. In the east of Northumberland's 'Household Book,' we find copies of it. According to an old custom of the clergy, 'Al maner of thinges yerly yeven by my lorde of his maundy, ande my ladyis, and his lordshipis children.'

Dr. E. D. Clarke, in his 'Travels in Russia,' 4to, Camb. 1810, vol. i., p. 55, gives an account of the ceremony of washing the feet in the Catherdral of Smolensk, and says that it was performed in the cathedral, which is crowded with spec- tators. The archbishop performing all, and much more than is related of our Saviour in the 13th chapter of St. John, takes off his robes, girds up his toga with a towel, and prostrates himself before the doors of the cathedral. The representative of St. Peter, who rises, and the same inter-locution takes place as between our Saviour and that apostle.

('Nebel's 'Glossary,' v. 'Maudn.' Brand's 'Popular Antiquities,' 4to, Lond., 1869, vol. i., p. 124-125; 'Gent. Mag.,' vol. x., p. 172; 'Fox's 'Encyclopedia of Antiquities,' p. 702.)
aguliers on the Figure of the Earth,' Oldenburg, 1738 (this book, by some attributed to Maupertuis, is supposed to have been written by the Count de Bâvre). 'The Figure of the Earth,' as determined by the Observations of MM. Maupertuis, Clairaut, Camus, Le Monnier, Outibier, Celsius, &c., near the Polar Circle,' Paris, 8vo, 1738. 'Letter to Madame de Vertille,' Paris, —. Letter to Euler,' —. 'Letter of an English Clockmaker to an Astronomer of Paris, concerning the meridian,' Paris, 8vo, 1738. 'Observations on the Meridian of MM. Clairaut, Camus, and Le Monnier,' 8vo, 1740. 'Miscellaneous Works,' 12mo, Amsterd., 1744. 'Philosophical Reflections on the Origin of Language and the Signification of Words,' Paris, 1753. 'Veux physique,' 1745 and 1777. The works of Maupertuis were collected and published at Dresden, in 1752, 4to.; and at Lyon, in 1754 and 1768, in 4 vols. 8vo. Among his memoirs in the Transactions of the French Academy are a number of Memoirs on the action of the Wind,' 1753. 'Veux physique,' 1745 and 1777. The works of Maupertuis were collected and published at Dresden, in 1752, 4to.; and at Lyon, in 1754 and 1768, in 4 vols. 8vo. Among his memoirs in the Transactions of the French Academy are a number of Memoirs on the action of the Wind,' 1753. 'Veux physique,' 1745 and 1777. The works of Maupertuis were collected and published at Dresden, in 1752, 4to.; and at Lyon, in 1754 and 1768, in 4 vols. 8vo. Among his memoirs in the Transactions of the French Academy are a number of Memoirs on the action of the Wind,' 1753. 'Veux physique,' 1745 and 1777. The works of Maupertuis were collected and published at Dresden, in 1752, 4to.; and at Lyon, in 1754 and 1768, in 4 vols. 8vo. Among his memoirs in the Transactions of the French Academy are a number of Memoirs on the action of the Wind,' 1753. 'Veux physique,' 1745 and 1777.

MAUR. ST. There appear to have been two persons of this name: one a disciple of St. Benedict, who is mentioned in St. Gregory's 'Dialogues,' and who is said to have died in 584; the other, abbot of Glenluce, who lived till 640, and who is considered as the founder of the Cistercian order by St. Benedict. Of the former of these a Life is extant in the great work of the Bollandists. His day was the 15th of January.

(Life of Maupertuis, by Delambre, in the Biographies Universelles, 1847, vol. 5, 1851.)

MAUR. ST., CONGREGATION OF, a celebrated society of Benedictines in France, who profess to follow the rules of St. Benedict, as prescribed by St. Benedict. It was founded by Pope Gregory XV., at the instance of Louis XIII., gave it his approval by his brief dated 17th May, 1621; and Urban VIII. granted it new privileges by a bull dated 21st January, 1627. The report of the sanction of this congregation induced several bishops, abbots, and monks to admit their monasteries to the direction of its superior, so that the congregation at last became divided into six provinces, of which each contained about twenty religious houses. The most considerable were, St. Denys, St. Germain-des-Prés, St. Remi at Rheims, St. Denis at Paris, St. Germain at Paris, St. Didier at Paris, St. Benoit sur Loire, Fescamps, and the Trinité de Vendôme. The monks, beside the rule of St. Benedict, had other particular statutes and constitutions, and were governed by a general superior, assistants, and visitors, who held a general chapter every six years. The houses are situated in the provinces of Mauresco and Molassy. The members of the order are not allowed to possess movable property, and are not permitted to engage in any business. The convents are situated at Maursco, Molassy, and other places in the Departments of the Vienne, the Charente, and the Charente-Maritime. The members of the order are not allowed to possess movable property, and are not permitted to engage in any business. The convents are situated at Maursco, Molassy, and other places in the Departments of the Vienne, the Charente, and the Charente-Maritime.

(Moreri, Diction. Historique, tom. viii, pp. 357, 358; Histoire Littéraire de la Congrégation de Saint Maur, 4to., Brussels, 1770, by Dom Tassin.)

Mauray, Santa. [SANTA MAURICE.]

Peta. [PIETÀ, ST.]

Maurice of Nassau. [NASSAU, HOUSE OF.]

Mauritania or Maurétania, which derived its name from its inhabitants Mauri or Maurusii (Mauretania), was bounded on the west by the Atlantic, on the north by the Mediterranean, on the south by the Guelta, and on the east by Numidia, thus corresponding to the northern part of Morocco and the western part of Algeria. The country of the Mauri was originally separated from that of the Massyph by the Moholath (Strabo, p. 827, Cassius) or Mogulath; the modern Massyph or Massa is the same as the Roman province of Mauritania; but the Roman province of Mauritania included the country inhabited by both these people.

Before the war with Jugurtha, the Romans had but little or no knowledge of Mauritania; of which Bocchus was at that time the ruler. (Salust, Bell. Jugurth., c. 19.) Mauritania was afterwards conquered by the Romans under Cnaeus Domitius Ahenobarbus, and subsequently divided into two provinces, the Mauritanian (Strabo, p. 827, Cassius), which extended from the mouths of the river Senegal to the borders of Numidia; the other province, which extended from the mountains of Betica in Spain to the borders of Numidia, was given by Augustus to Juba II., his paternal kingdom of Numidia having been erected into a Roman province. (Juba.) Juba died about A.D. 17, and was succeeded by his son Ptolemaeus, who was put to death by Caligula. Mauritania was shortly afterwards divided into three provinces, the Mauritanian, the ppen, in the province of Numidia, and the Mauritanian, which was divided from the other province of Mauritania, into the Roman province of Mauritania, by the amphitheatres of the atlas (Wadi al-Kebir). Mauritania Cesariensis was subsequently subdivided into two provinces: the western part retained the name of Cesariensis, but the eastern was called Cesariensis, from Stilii (Sefif), a town on the borders of Numidia.

Mauritania contained many towns of considerable importance under the Roman empire. Of these, the principal in Mauritania Tingitana were, Rusadir (Melitale), a seaport and a Roman colony, and Molendrum, which by the entrance of the Straits of Gibraltar, which received especial marks of favour from Augustus Cæsar (Dion, xi. 39), and became a Roman colony under Claudius (Pliny, v. 1); Zilis or Zelia (Azilla), a Roman colony, under Augustus Cæsar, and given to the emperor Claudius by Augustus Cæsar; and Stilius (Stilii), a town on the borders of Numidia, from the mouth of the river, which must not be confounded with the great river Lusus mentioned in Hanno's Périplo, which is probably the same as the modern St. Cyprian (Hanno's Périplo); Banna, a Roman colony, on the borders of Numidia; and a town on the Subur (Sébou); and, 50 miles south of the Subur, Salat (Sara el Sla), of which there are extensive ruins.

The chief towns in Mauritania Cesariensi were: Saldae, a Roman colony, under Augustus Cæsar, which divided the kingdom of Juba from the province of Numidia (Strabo, p. 831); Julia Cæsarea (Zeralsh, see Shaw, p. 40, 41, ed. of 1738), situated on the coast west of Salada, a Roman colony, which was originally called Iol (Strabo, p. 821; Pliny, v. 1); Signa (Stilium), which Pliny (v. 1) erroneously places opposite Malaga in Spain; and in the interior, south-west of Cirta, the important town of Sefif (Sefif), a Roman colony.

The physical features, &c. of Mauritania are described in the earlier articles of this work. The best account of the eastern part of Mauritania is in Shaw's Travels.

MAURITIUS, the Island of, called also ISLE DE FRANCE, is situated in the Indian Ocean, between 19° 35' and 28° 39' S. lat., and between 55° and 57° E. long. From another chain runs from the mountain of Bay of Moon, across the isthmus between the Sables (Ile de Sables) is nearly 37 miles, though in general it is only about 18 miles. The circuit is about 154 miles. The area is about 76 square miles, or nearly the extent of the county of Worcestershire.

The island is surrounded by a coral reef, generally running parallel to the shores, at the distance of one or two miles from them, and broken at irregular intervals by eleven breaks, by the greater number of which vessels of considerable burth may approach the island. The water between the reef and the shores, being less agitated than the open sea, affords facilities of communication between the places at the breaks, which, being more exposed, the shore in several places rises with a steep ascent and to a considerable elevation close to the water-edge. This is especially the case along the western coast. Along the eastern coast the surface is pretty level from Port Souillac to Grand Port, and from the latter to Port Louis, with the immediate neighbourhood of both places. The interior of the island consists of a great number of lofty hills, which however are mostly isolated, except between Cape Brabant and Fort Souillac, where they constitute a small chain called the walls of the mountain of Peter Boite to Caponnère Point. Some of the hills attain a considerable elevation, especially the Brabant mountains, near Cape
Brabant, and the Bamboo ridge, near Grand Port, which probably rise to 3600 feet above the sea-level. The origin of the island is without doubt volcanic, as shown by the irregularities of the surface, the presence of lava, pumice, and other volcanic productions. In the mountains at the back of Port Souillac and Grand Port is a small lake, which is considered to be extinct. The ground is generally covered with loose rocks, from the size of a man’s fist to pieces weighing a ton or more, and they are full of holes. The soil is shallow, and by no means distinguished by fertility, which is mainly to be attributed to its dryness. The dry season is about 8 months in duration. It is accompanied by a lumpy reddish mould, evidently impregnated with oxide of iron, and crumbling to dust in the hand.

The rainy season lasts from November to March or April. It is a continual one, with four or five intervals, and there is a wind generally blowing the entire time. During this season the wind changes frequently, and makes the tour of the horizon. In the dry season the wind generally blows from the south-east. It is strong during the day, but calm at night. During the months of July, August, and September there are frequent storms, but they last only a short time.

The island is traversed by numerous watercourses, which run off from the centre towards all points of the compass; but they are only filled with rain during the rainy season, when they form numerous cataracts. The only regular river on the island is the Savanne, which is about 100 miles long, and rises in the interior. It occasionally carries a load of mud and sand sufficient to clog the mouths of the rivers and canals, and to influence the navigation of vessels. The island is supplied with water by numerous springs and wells.

The soil of Martinique is very productive, and the crops are of great value. The island is divided into three districts: the north, the centre, and the south. The north is the most fertile, and produces the best crops. The centre is the most barren, and is used for grazing cattle. The south is the most mountainous, and is used for grazing sheep.

The climate of Martinique is mild, and the temperature is moderate. The average temperature is about 22 degrees Celsius. The rainfall is about 2,000 millimeters per year. The island is subject to occasional hurricanes, which cause damage to the crops and infrastructure. The soil is generally sandy and light, and the crops are well adapted to it. The main crops are sugar cane, coffee, and cotton. The island is also famous for its tobacco and cotton crops. The production of sugar is the main economic activity, and it is exported to various countries around the world. The island is also famous for its beautiful beaches and natural landscapes, and it is a popular tourist destination. The French settlement of Martinique dates back to the 17th century, and it was a center of the sugar industry.
The printed works of Maurolico are numerous, and those which he wrote still more so; a list of all (but without titles or dates for the printed works) is given by the Abbé Scenna. Among the former must be mentioned an edition of Auto-
lyus with commentaries, Messina, 1598, folio; of Archi-
méros, 1670 (misprinted 1570 in the article cited) and 1681
(or 1682?)—the Phenomena of Euclid, 1588, and an edition
of Theodosius and Menelaus in the same year, which con-
tains a table of scorants, being the first introduction of these
lines to Italy. The Maurolico wrote at Venice, 1572, containing
treatises on the sphere, the calendar, astronomical instru-
ments, gnomonics, music, and arithmetic; treatise on Cos-
mography, 1543. Other works have been stated as printed,
but which are not included in this list. Maurolico is
always one of those names which appear with Eleusidian,
and his name is found in connection with the Pythagorean
and hermetic schools.

Maurolico will be remembered by his geometrical writings,
particularly his manner of treating the conic sections, by
his optical theorems, and by his arithmetical works; but the
interest which attaches to his writings connects them rather
with the general history of the science than with his own
biography, as there are no very prominent discoveries to re-
cord. In his arithmetic he proceeds upon geometrical
principles, as his eulogist states (and with confirmatory
descriptions and citations), but at the same time with an
attention to numerical relations, when he introduces them in a form closely approaching to the modern algebra,
the science of which they approach, without the language.
It is to be remembered that before the time of Vieta the
method of expressing general formulae, which now consti-
tutes the foundation of the algebraic science, had not yet
been established. It is true, however, that it is the same
source from which we see one of the works themselves are
very scarce, that the transition from the arithmetical to the
geometrical is the approach to the world of the kind of
which Descartes has been so greatly occupied in the Art
of Vieta; and that it seems to us, from such parts of Maurolico's writings
as we have seen cited (the works themselves are very scarce),
and the circumstances which must be explained, that the latter not being in
the list of the magistrates of Castile, Portugal, and those
who die in the direct track between the Hindu algebra
and the doctrine of Vieta. Nevertheless the propositions of
Maurolico upon the summation of series, and the methods by which they
were deduced, form a very curious step in the progress of
arithmetical inquiry.

M. Clasles, in his lately published work on the history of
geometry [Geomtric, page 156] carries his opinion of
Maurolico as an algebraist, to a startling degree of novelty.
'Analysis is infinitely indebted to this geometer, who never-
theless translated it into algebra in a spirit of research
that introduced the use of letters instead of numbers, and
who gave the first rules of the algebra of numbers.' Not having
examined Maurolico ourselves, we can only say that neither
Warington nor Cramer, nor the fragment of the last
expressly speaks of Maurolico as having 'the spirit
of algebra without the language.' Perhaps however the
assumption of Maurolico may provoke some attention to the
subject, and excite an inquiry into the extent of the claim
made, for it now remains to be seen, but from Pius's description
we may, has been yet hardly begun.

MAURUS TERENTIANUS, a Latin grammarian,
who is said to have been born at Carthage. The time in
which he lived is uncertain, but Cursus supposes him to have
been the same Terentianus who is addressed by Martial as the
prefect of Syrene in Egypt (Epigrum, i. 87); and he at
all events lived during or before the time of St. Augustine,
since he is mentioned by the latter in terms of the highest
reverence. (De Civiitae Det, vii. 2; De Unitate Credente,
c. 17.)

The only work of Maura which has come down to us is
entitled ' De Litteris, Syllabis, Pedibus, et Metris Carcmen.'
It is included in the ' Granarum et ex Vectarum, edelis et
decis, Canes, 1600, and has been republished by D. J. V.
Lennep, Leyden, 1825, and by Lachmann, Leipzig,
1836.

MAUSOLEO is now used as a general term applied
to a monumental chamber, or a building for the reception of a
monument; but it originally designated the magnificent
structure raised by Artemisia as the tomb of her husband
Mausolus, king of Caria, at Halicarnassus, n. 392. Of
this monument, once reckoned among the wonders of the
world, it now remains nothing but a circular mass of marble
to 113 feet on its sides, and 93 on each of its ends
or fronts, and to have been decorated with a pedestal of
thirty-six columns (supposed by Hardouin to have been 60
feet high, or upwards), above which the structure was carried
up in a pyramidal form, and surmounted at its apex by
a marble quadraed column supported by four fantastic
figures, according to Vitruvius, who, according to
Vitruvius, was joint architect with Satyrus in the building.
It was further decorated with sculptures and reliefs by
Scopas, Bryaxis, Timotheus, and Leochares. The entire
height was 140 feet.

The mausoleum erected at Babylon by Alexander the
Great, in honour of Hephaestion, appears to have been still
more magnificent, and somewhat extravagant in its decora-
tions, as far as can be gathered from the account given of it
by Strabo. It was adorned with many gilded
rostra, or beaks, of two hundred and forty ships, and
the terraces successively more elevated and pointed, the
uppermost of which was crowned by a colossal statue of the
emperor. These steps were planted with trees. From traces of
something yet remain, it is conjectured that there was originally
an ascending portico attached to the building in the same manner as that of the
Pantheon, though considerably smaller in proportion to the rest of the
plan, as it could not have been carried up higher than the
ground. The temple, according to Apollodorus's representa-
tion of it, in his 'Baukunst bei den Alten,' it was a Co-
richian hexastyle, advanced one intercolumnium before the
side-walls connecting it with the circular edifice
beind it.

Hadrian's mausoleum, now converted into the Castello
of St. Angelo, in which shape it is said to be almost in
every one, is a work of most massive construction, and originally
possessed an unbroken circular mass of building, erected
upon a larger square basement, lofty in itself, yet of moderate
height in proportion. The mass was supported by the sapera
about twice as high as the former. This nearly solid rotunda,
which was originally coated with white marble, had on its
summit numerous fine statues, which were broken to pieces
by the Goths, who attempted to take the building by
storm. Neither are any remains now left of the uppermost
stage of the edifice, which assumed the form of a circular
perpendicular temple, whose diameter was about one-third
of the larger circular structure. This was inscribed of the
twenty-four beautiful marble Corinthian columns
which afterwards decorated the basilea of San
Paolo fuori delle Mura (partially destroyed some few years
ago by fire, but now nearly restored); and its tholos or
temple was surmounted by a colossal pine-apple in bronze
now placed in the gardens of the Vatican.

Such places as Henry VII.'s Chapel and the Pantheon
of the Escorial may also be considered as mausoleums,
but the term is generally restricted to a detached edifice
erected as a repository for the remains of illustrious
persons. There are several structures of the kind in the parks of our
nobility; among the most remarkable is that at Castle
Howard, the seat of the earl of Carlisle, and one of Hams-
worth Moore's best works, and of which the frieze in the
Germaine Stye, elevated upon a basement, and crowned by a
dome: plans, sections, &c., of this structure have been beau-
tifully engraved by Moses. The mausoleum of Rockingham's
mausoleum by Carr is another ornamental structure of the
kind, composed of three stories, Doric, Ionic, and Corinthian.
We may also mention those at Cobham in Kent, and Brock-
ley in Lincolnshire, by the late James Wyatt. The
mausoleum of Louis, queen of Prussia, at Charlottenburg near
Berlin, has a Grecian-Doric portico, but is not so remarkable
as that of the tomb, which is the recumbent figure of that princess, the chief d'oeuvre
of Rauch's chisel.
MAWES, ST. [CORNWALL.]

MALMOISINE, or MALMOISIE, WILLIAM DE, was made in France, and has been thought by some to have been a native Frenchman. He afterwards came to Scotland, where he was made one of the clerici regis, and archdeacon of St. Andrew’s, in which latter capacity he was present at the baptism of Prince Alexander, afterwards King Alexander II. He was made chancellor of Scotland 6th September, 1199, about which time also he was elected bishop of Glasgow, and consecrated the following year by special precept from the pope. (Fordin. vi. 61.) In the year 1203 he was translated to the see of St. Andrew’s, where he was served at the table of the high chancellor of Scotland. In September, 1208, he dedicated a new cemetery at Dryburgh Abbey. (2 Chalm. Caled., 339.) He afterwards made a visit to the Continent; and having returned, we find him and the bishop of Glasgow, in 1211, possessed of legislative powers from Rome. He was at Perth a great council of the clergy and people, to press upon the nation the pope’s will and command that an expedition be undertaken to the Holy Land. (Fordin.) In 1214 he accompanied the king to King Alfred’s tomb (1 Kii. ix. 1), and is said to have set the crown upon the king’s head. The next year he went with the bishops of Glasgow and Moray and the mitred abbot of Kelso to the Fourth Lateran Council, where the doctrines of Wycliffe were condemned, and to him is said to have been addressed. From the Continent he brought with him into this country various orders of monks and mendicants, till then unknown here, and had convents of Black Friars erected at Aberdeen, Ayr, Berwick, Edinburgh, Elgin, Inverness, Montrose, Perth, and Stirling, and monasteries of Vallisculum at Pluscardine, Beaulieu, and Archdall. He wrote lives of the popish saints Ninian and Kentigern. It was to him and in his time that Pope Innocent III. sent the decretal letters which we find in the 'Corpus Juris Canonici' (Decret. Gregor. iii. 8; Brev. of Gregor. iv. 6; of Hildebrand, c. 49, c. 6; of Alexander II., ib. c. 45, c. 6; of Alexander III., ib. c. 45, c. 6; and B. v., tit. 39, c. 28), to the bishop, archdeacon, and abbot of St. Andrew’s, respectively.

But zeal for the church was by no means this prelate’s only passion; for we find that on one occasion, noticed by Fordin. (viii. 62.), he was deprived Dunfermline Abbey of the presentation to two churches, because the monks had failed to provide him wine for supper. Fordin adds that the monks had indeed supplied wine; but the bishop’s own attendants had drunk it all up. It may be that the name of Malmoisine was originally but a mere sobriquet, from his mislabey drinking propensity, as if it were ‘William of the Malmseyl-butt.’

He was consecrated bishop of St. Andrew’s till his death (Keith’s Bishops), which happened on the 9th July, 1328 (3 Chalm. Caled., 616); and he is remembered in a composition respecting tithes, anno 1297 (2 Connell, On Tithes, 413).

MAXENTIUS, MARCUS AURELIUS VALERIUS, son of Maximinus, the colleague of Diocletian in the empire, was living in obscurity when, after his father’s abdication, and the elevation of Constantine to the rank of Caesar, he became envious of the latter, and dissatisfied with the neglect of Galerius. Accordingly he stirred up a revolt among the praetorian soldiers at Rome, and was proclaimed emperor, A.D. 305. Galerius, who was then in the East, sent orders to Severus Cæsar, who had the command of Italy, to march from Milan to Rome with all his forces, and prepare for battle. In the meantime Maximinus, who lived in retirement in Campania, came to Rome, and was proclaimed emperor as colleague with his son, A.D. 307. Severus, on arriving with his troops near Rome, was defeated by most of his officers and soldiers, who had formerly served under Maximinus, and were still attached to their old general. Upon this he retired to Ravenna, which he soon after surrendered to Maximinus, on being promised his life and liberty; but Maximinus put him to death. Maximinus then proceeded to Gaul, in order to form an alliance with Constantinus, leaving Maximinus at Rome. Galerius, soon after arrived in Italy with an army; but not finding himself strong enough to attack Maximinus in Rome, and fearing the same fate as that of Severus, he made a precipitate retreat. Maximinus, returning to Rome, was refused for some months together with his son, but afterwards guarded with him, and took refuge with Galerius, who acknowledged him as emperor. There were then no less than six emperors, Galerius, Maximianus, Constantinus, Maxentius, Licinius, and Maximinus Daia. In the following year, 309, Maxentius was proclaimed consul at Rome, together with his son, M. Aurelius Romulus, who in the next year was accidentally drowned in the Tiber. Maxentius possessed Italy and Africa; but Africa revolted, and the soldiers proclaimed as emperor an adventurer of the name of Alexander, who reigned at Carthage for three years. In the year 311 Maxentius sent an expedition to Africa, defeated and killed Alexander, and burnt Carthage. Proud of this success, for which he had the honour of a triumph, Maxentius made great preparations to attack Constantine, with whom he had till then preserved the appearance of friendship. Constantine moved from Gaul into Italy, advanced to Rome, and defeated Maxentius, who was drowned in attempting to swim his horse across the Tiber, A.D. 312. [Constantinus, Flavius Valerius.]

MAXIMA AND MINIMA. These Latin words, which simply mean 'greatest' and 'least,' are used to imply, not the absolute greatest and least values of a varying quantity, but the values which it has at the moment when it ceases to increase and begins to decrease; or vice versa. Thus if it be said that the height of the barometer was a maximum at ten o’clock, it means that up to that hour the barometer rose, and then began to fall; in which case it would still be said to have been a maximum, even though it should afterwards rise, and stand at a greater height than at ten o’clock. Thus it is possible that there should be several maxima and minima in one day, and even that one of the minima should be greater than one of the maxima: that is, at one moment when the fall ceases and a rise begins, the barometer may then be higher than it was at another time when a rise had ceased and a fall begun.

The theory of maxima and minima is, mathematically speaking, very simple. It is obvious, from the definition of a differential coefficient, that if y be a function of x, and if \( \frac{dy}{dx} \) is positive; and if y diminishes, \( \frac{dy}{dx} \) is negative. If the words increase and diminution have their full algebraical sense, this proposition is true whatever the sign of y may be. It follows that when increase ceases and diminution begins, \( \frac{dy}{dx} \) changes from positive to negative, and when diminution ceases and increase begins, it changes from negative to positive. But as a quantity cannot change its sign without becoming either nothing or infinite; it follows, first, that y can only be a maximum when x has such a value that \( \frac{dy}{dx} \) is nothing or infinite; secondly, that there is not then a maximum unless the latter changes from positive to negative, when x increases through that value; nor a minimum
unless the same differential coefficient changes from negative to positive, in the same case.

Thus when \( y = a + x - x^2 \), the differential coefficient of which is 1 - 2x, we see that the latter changes sign when \( x \) changes from less than 1/2 to greater than 1/2; and the change of sign is from positive to negative. There is therefore a maximum when \( x = 1/2 \), and this maximum is \( a + 1/2 - 1/4 \), or \( a + 1/4 \).

When \( \frac{dy}{dx} = 0 \) (which is by far the most common case), and there is a maximum, it changes sign from + to −, or diminishes, algebraically speaking: therefore \( \frac{d^2y}{dx^2} \) is negative. Similarly, when \( \frac{dy}{dx} = 0 \), and there is a minimum, \( \frac{d^2y}{dx^2} \) is positive. But when \( \frac{dy}{dx} \) is infinite, and there is a maximum or minimum, this additional rule does not apply.

Works on the differential calculus give the development of this theory and examples. We shall only here add one of the rules for determining the maximum or minimum when there are two distinct variables.

When \( z \) is a function both of \( x \) and \( y \), two variables independent of one another, there may be a maximum or minimum when \( \frac{dz}{dx} \) and \( \frac{dz}{dy} \) are both nothing, both infinite, or one nothing and the other infinite. When they are both nothing, which is the only case in which this theory is of any practical application, it must be determined as follows, whether there is any maximum or minimum, and which it is.

Find the values of \( x \) and \( y \) which make \( \frac{dx}{dy} = 0 \),

\[
\frac{dx}{dy} = 0,
\]

and with any pair of these values find the value of the expression

\[
\left( \frac{d^2y}{dx^2} \right) \left( \frac{d^2x}{dx \, dy} \right) - \left( \frac{d^2x}{dy \, dx} \right) \left( \frac{d^2y}{dy^2} \right).
\]

If this be negative, or nothing, there is a maximum or minimum; if it be positive, there is a mixture of the two which can only be satisfactorily explained by illustrations drawn from the theory of curved surfaces. When the expression is negative or nothing, there is a maximum if \( \frac{d^2y}{dy dx} \) and \( \frac{d^2x}{dx \, dy} \) be both negative, and a minimum if they be both positive.

The usual method of establishing all the preceding formulae, namely, by the application of Taylor’s theorem, applies only to the cases in which the differential coefficients become nothing, and not to that in which they become infinite. It is also frequently stated that there is always a maximum or minimum where a differential coefficient vanishes, which is not true.

**MAXIMIANUS, Marcus Valerius**, a native of Pannonia, born of obscure parents, served in the Roman armies with distinction, and was named by Diocletian his colleague in the empire, A.D. 286. The remainder of his life is given under **Diocletian, Constantine, and Maximinus**. He was put to death at Marseilles, by order of Constantine, for having conspired against his life, A.D. 318.

**MAXIMIANUS, GALERIUS VALERIUS**, was surnamed Armentarius, on account of having been a herdsman in his youth. The events of his life are narrated under **Diocletian, Constantius I., and Constantinus**. According to the historians, he died (A.D. 311) of a loathsome disease, which was considered by his contemporaries and himself as a punishment from heaven for his persecution of the Christians.

**Maximilian. [Habsburg, House of.]**

**Maximianus, Caius Julius Verus,** was originally a Thracian shepherd. He was of gigantic size and great bodily strength. He entered the Roman army under Septimius Severus, and was rapidly advanced for his bravery. Alexander Severus gave him the command of a new legion raised in Pannonia, at the head of which he followed Alexander in his campaign against the Germans, when the army being encamped on the banks of the Rhine, he conspired against his sovereign, and induced some of his companions to murder him in his tent, as well as his mother **Maternus,** A.D. 235.

Maximianus, being proclaimed emperor, named his son, also called Maximinus, Cæsar and his colleague in the empire. He continued the war against the Germans, and devastated a large tract of country beyond the Rhine, after which he repaired to Illyricum to fight the Dacians and Sarmatians. But his cruelty and rapacity roused enemies against him in various parts of the empire. The province of Africa revolted, and proclaimed Gordianus, who was soon after acknowledged by the senate and the people of Rome, A.D. 237.

But Capellianus, governor of Mauritania for Maximinus, defeated Gordianus and his son, who fell in the struggle, after a nominal reign of little more than a month. **Gordianus, Marcus Antonius Africanus.** Rome was in consternation at the news, expecting the vengeance of Maximinus. The senate proclaimed emperors Claudius Pupienus Maximus and Decimus Celius Balbinus, but the people insisted upon a nephew of the younger Gordianus, a boy twelve years of age, being associated with them. Maximinus marched out of Rome with troops to oppose Maximinus, who had crossed the Isenio and laid siege to Aquileia. Maximinus experienced a brave resistance from the garrison and people of that city, which excited still more his natural cruelty, and the soldiers, being weary of him, mutinied, and killed both him and his son, A.D. 238. Maximinus the father, then sixty-five years old, was a ferocious soldier and nothing else, and wonderful tales are related of his voracity, and the quantity of food and drink that he swallowed daily. His son is said to have been a handsome but arrogant youth. (Capitolinus, in *Historia Augusta*.)
share the government of Syria and Egypt. After the death of Galerius, A.D. 311, Maximinus and Licinius divided his dominions between them, and Maximinus obtained the
whole of the Asiatic provinces. Both he and Licinius behaved ungratefully towards the family of Galerius, their common benefactor. Valeria, the daughter of Diocletian and widow of Galerius, having escaped from Licinius into the dominions of Maximinus, the latter offered to marry her, and on her refusal banished her with her mother into the deserts of Syria. He persecuted the Christians and made war against the Armenians. A new war having broken out between Licinius and Maximinus, the latter advanced as far as Adrianople, but was defeated, died in Asia, and died of poison at Tarsus, A.D. 313.

MAY

Accordingly set out for Moscovy, and was astonished to meet with such a prodigious store of Greek literature. He was directed by Vassili to examine and copy it, as were most deserving of translation; but as he was then wholly ignorant of the Slavonic tongue, he had first to prepare a Latin version, which was afterwards rendered by others into Slavonian. It was then that the translations of a number of a Platonic writer with a commentary, and the apologues of St. John, were produced. Desirous of returning to his convent, it was only at the instances of the Tsar, who wished him to revise the earlier translated books of the Greek Church, that he took up the work; and he said of himself, which he was then qualified by having obtained in the interim a competent knowledge of Slavonian. The diligence with which he executed it tended however only to raise up numerous enemies against him, among the rest Daniel, the metropolitan, who by his corrections he deemed it requisite to make so numerous as to give great offence to the more zealous. What more immediately tended to his disgrace was the firmness with which he opposed Vassili's divorce from his first wife Salome (on account of barrenness), and his marriage; and in the 27th year of his reign he was banished. He was condemned by a synod, excommunicated as a heretic, and imprisoned in the Orotch monastery at Yver, in 1525; in this confinement he was treated with such rigour till the death of the metropolitan Daniel; after which the bishop of Yver interceded for him and obtained his liberation. His severity was used towards him. At length the 27th year, Ivan Vassilievitch, consented to his being removed to the monastery of St. Sergius, where he continued until his death in 1566. A number of works of his (chiefly in manuscript) on a variety of subjects, dogmatical, metaphysical, &c., from which considerable information has been derived with regard to the opinions and prejudices of the clergy and people in that age; nor was he at all timid in exposing the abuses and vices of the clergy, which alone would account for the persecution which he drew down upon himself; but after his death even those who had been among the more violent against him, admitted his innocence, nor was it long before his memory came to be regarded with the greatest respect.

MAXWELL, ROBERT, LORD, son of John, third Lord Maxwell, who was killed at Flodden, in September, 1514. He had been knighted, and appointed steward of Annandale, on the resignation of his father, on the 19th of June in that year. In 1515 he was appointed the usual attendants of the West Marches. In 1524 he was provost of Edinburgh, and in that capacity chosen one of the lords of articles for the confessions of the consistory of the Kirk of Scotland. He was appointed, of the privy-council; and on the 17th of November, 1533, appears in the sederunt of the Court of Session as the highest court of justice in Scotland.
and the fifth in the calendar of Numa Pompilius. In the Alban calendar it consisted of twenty-two days; of thirty-one in the calendar of Romulus; and of thirty in that of Numa. Julius Caesar restored it to the old day of which Numa had deprived it, and of which it still keeps possession. Its etymology is doubtful. Ovid, in the fifth book of his 'Fasti,' proposes three derivations: one from 'majestas'; another from 'majores,' a term which signified the pateres, or governors, of the people; the third from 'Mata.' The Roman month was under the protection of Apollo; and on account of the celebration of the Lemuria, marriages undertaken during its course were considered illomened. (Ovid, Fasti, v. 483-490.)

May flowers are called it 'May-morn;' and, in their native language, 'Tri-milich,' three-milk month, when cows were milked three times a day.

MAY-DAY AND MAYING. It was antiently the custom, observes Brand, for all ranks of people to go out a-maying early on the first day of May. Bourne (Antiq. Vulg., ch. xxv.) tells us that, in his time, in the villages in the north of England, the juvenile part of both sexes were wont to rise a little after midnight on the morning of that day, and walk to some neighbouring wood, accompanied with music and the bonfires used of old, where they broke down branches from the trees, and adorned them with nosebags and crowns of flowers. This done, they returned homeward with their boats about the time of sunrise, and made their doors and windows triumph in the form of a show. The flowers in this sport were observed by noble and royal personages as well as the vulgar. Chaucer, in his 'Court of Love,' says that early on May-day, 'Fourth goth at the court, both most and lest, to fetche the flowers from London and from Rome.'

It is on record that King Henry VIII. and Queen Katharine partook of this diversion; and historians also mention that he, with his courtiers, in the beginning of his reign, rose on May-day very early to fetch May or green bouquets; and that in their return, they exchanged the two or three bouquets, showing to the wood. Shakspere ('Henry VIII.,' act v., scene 3) says, it was impossible to make the people sleep on May morning; and ('Midsummer Night's Dream,' act iv., scene 1) that they rose early to observe the rite of May. The court of King James I. presided over, on May morning, the opening of the blossom, under the auspices of the Pope, as Spelman's 'Glossary' remarks, under the word 'Maiuma.'

Two or three minor observances still remain to be slightly noticed. The may-pole, decked with garlands, round which the dancing was performed, was one of the chief points in the continued festivity; and, as Spelman remarks, the garlands were adorned with flowers, danced before the doors of their customers.

Most of the rites here enumerated had, doubtless, their origin in the heathen observances practised at this season of the year in honour of Flora, the deity who presided over fruits and flowers. (Hospinian, De Factis Judaeorum et Ebraorum, fol. 106.) Polidore Virgili notices the prevalence of May customs in Italy. An account of some of those observed in France will be found in the 'Select Cottolinum, tom. iii., p. 446; and Dr. E. D. Clarke, in his 'Travels,' vol. i., 4to., Cambr., 1810, p. 110, notices the promenades and other observances on the first of May at Moscow, among the Cossacks, as the most interesting of a stranger. See also Brand's 'Popular Traditions,' 4to. ed. ii. p. 179-204.

MAY-WEED (Anthemis arvensis, or Wild Chamomile), a troublesome weed in corn, which is difficult to eradicate, as it is propagated both by seed and by the long and wiry rhizomes, into which it will readily take root. It flowers in May, as its name denotes, and sheds its seed long before the corn is reaped. The only certain mode of exterminating it is by great care in clearing the land when it is fallow or prepared for turnips, ploughing the land in October, and allowing it to go to seed. In the alternate system it is soon got rid of by the hoeing of the green crops; clever also kills it.

when the land is in good heart, and in the convertible husbandry it is destroyed while the land is in grass, and mown. It is a sure sign of a slovenly husbandry when the land is covered with May-weed. It often infests farms which have been neglected by their owners, and it is indispensable to get rid of it before any attempt at improvement is made. A good clean fallow is the surest means of destroying this weed as well as all other annuals: by repeated harrowings the seeds are broken up and brought to the surface, where they vegetate, and are afterwards destroyed. The best season to harrow is in dry weather, interspersed with occasional showers, as in the months of April, May, and June.

MAY, THOMAS, an early English dramatist and historian, was born in 1517. He was a pupil of Sir Thomas May, who was descended from an ancient family of the county of Sussex. Having finished his education at Sidney College, Cambridge, he came to London, and made the acquaintance of several persons of distinction.

In 1547 May was opposed to Sir William Davenant as candidate for the office of laureate, which the death of Ben Jonson had left vacant. Sir William was successful, and his success so exasperated May, that although hitherto a courtier, he became hostile to the king's party, and wrote a history in which he attacked the court, which was found dead in his bed. It is supposed that he was strangled by the tightness of his night-cap-strings. He was buried in Westminster Abbey, near John Cambden the historian; but his body was taken up after the Restoration, and removed to a vault in the church of St. Stephen's, Westminster, and his monument in the abbey pulled down.

Besides a history of parliament, he wrote a history of Henry II., and made a translation of Lucan's 'Pharsalia,' with a continuation to the year 1516. These works are supposed by some to be five in number, and these titles are named 'Agrippina,' 'Antigone,' 'Cleopatra,' 'The Heir,' and 'The Old Couple.' The last two are comedies, and are printed in Dobson's Collection. Phillips and Windeatt have printed, in the 'Old Wife's Tale,' and 'Orlando Furioso,' but the dates assigned to the first publication of these pieces, if correct, render the supposition impossible.

MAYBOLE, a parish and market-town in the district of Carrick and county of Ayr. The town is pleasantly situated upon a small eminence surrounded by hills, and its direct distance is about 5 miles from the sea-coast and 70 south-west by west from Edinburgh. It was erected into a burgh of barony by a charter of James V., dated 24 Nov., 1516, but the town is not till for the parliament of the 17th century that the burghs appear to have availed themselves of the privilege thus conferred upon them of electing their own magistrates. The management of the affairs of the burgh is vested in a council of nineteen members, who hold their office during life. The revenue, derived from landed property and an annual tax called 'stunt,' averages 65l. per annum, which is about equal to the expenditure. The streets are cleaned and kept in repair at the expense of the burgh. There are no manufactures, although the chief part of the inhabitants are employed in handloom weaving for the Glasgow houses. The principal building is the church; it is large, and surmounted by a steeple in very bad taste. The population of the parish in 1811 was 3521, of which more than one-half were resident within the boundary of the burgh. There are in all thirteen schools, and one of these, called the 'subscription school,' is chiefly supported by the Irish inhabitants. There are also a savings bank and several publicans.

In the trench of the 'Red Lion' is shown the room where Knox, and Kennedy, the abbot of Crossraguel, accompanied by eighty of the nobility and gentry of the country, assembled, the former to impugn the mass, the latter to defend it; and the name of the house was changed, and a "Red Club," which holds triennial festivals, at which men of all parties meet to testify their gratitude for their deliverance from the domination of Rome, and their sure enjoyment of Protestant principles, achieved for them by Knox and his coadjutors.

(_New Statistical Account of Scotland; Parliamentary Report on Scotch Burghs, &c._)
MAYENCE. [Maine.] MAYENNE. (River and Town.) [Mayenne.]

Mayenne, a department in the western part of France, bounded on the north by the departments of Manche and Orne, on the south by that of Maine et Loire, and on the west by that of Ille et Vilaine. Its form approximates to that of a parallelogram, having an average length of 50 or 52 miles from north to south by west, and an average breadth of 30 miles from west to east. This breadth varies somewhat, being below the average area of the French departments, and almost equal to that of the English county of Norfolk. The population in 1831 was 332,386; in 1856 it was 361,785, showing an increase in five years of 30,000, or between 8 and 9,000 inhabitants more than 181 inhabitants to a square mile. In density of population it is above the average of France, but rather below the English county with which in area we have compared it. Laval, the capital, is in the Mayenne, 149 miles in a direct line west-southwest of Paris, or 169 miles by the road through Dreux, Alençon, and Mayenne, in 48° 4′ N. lat., and 0° 44′ W. long.

The northern part of the department is the most elevated. The principal range of the Armorican chain of mountains, and through the valley which separates the basin of Loire from that of the Vilaine, skirt the western border, the hills gradually subsiding as they proceed southward. Another branch of the Armorican chain skirts the eastern border, subsiding into the plain sooner than the western range, and presenting the valley watered by the Mayenne and its tributaries. The department is almost entirely occupied by the rocks of earlier formation, being included in the great primitive district of Bretagne. There was in 1834, 175 coal-mines, employing 4,000 men, and yielding about 5,000 tons annually. There were five mines of anthracite (besides two others not worked), giving employment to more than 300 men, and yielding annually about 15,000 tons. Some iron-works in 1834 were five, having eight furnaces for smelting pig-iron and fifteen forges for making bar-iron. Charcoal was the fuel almost exclusively employed. Freestone, slates, and marble are quarried.

The department, the Mayenne, which rises just beyond the boundary of the department, near the northeast corner, and flows westward (sometimes in this department, sometimes in that of Orne), 22 miles, to the neighbourhood of Lassay; from thence it flows southward 52 miles, and after this forms the valley which separates the basin of the Loire from that of the Vilaine.

The number of Routes, or government roads, in 1837, was five, having an aggregate length of 157 miles, viz. 107 in repair, 44 out of repair, and 6 unfinished. The principal road from Paris to Laval passes through the department, joining the road from Paris to Rouen at Pre-en-Pail to Mayenne, and from thence south by the valley of the Mayenne to Laval, where it turns off to the west and quits the department. Roads from Laval run southward by the valley of the Mayenne through Château-Gontier to Angers (Maine et Loire), south-east by Meslay to La Flèche (Sarthe), and eastward to Le Mans (Sarthe). Roads from Mayenne lead northward to Domfront, then north to the valley of the Seine, and south to St. Malo (Ille et Vilaine). There are several departmental roads, having an aggregate length of 178 miles, viz. 109 miles in repair, 17 out of repair, and 52 unfinished. The by-roads and pathways have an aggregate length of many miles.

In 1834, 15,826 town, 16,401 whole commune; in 1856, 17,519 communes, on the Mayenne [Laval]; Montrou, on the Seine; Erren on the Loire; and the small town of Mayenne (commune) on the Loire. The department has a small area and few inhabitants, and the towns are cultivated to advantage. Among the vegetables cultivated is the gigantic celery, which grows above the height of a man. The pools produce a plant, the 'water chestnut,' the fruit of which, enveloped in a husk, founds on the surface of the water. The most conspicuous crop is buckwheat. Meadows and grass lands, including the heaths and other open pastures, are extensive, occupying from one-fifth to one-sixth of the soil; the number of cattle reared is considerable, especially cows, from whose milk excellent butter is made; there is large flax for the wool of which is in good repute; the horses are of small size; swine and poultry are numerous, and a vast number of bees are kept all over the department. The woodlands of the department are not extensive.

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other, and are separated by the river Mayenne. The town, properly so called, is on the right bank, where the hill is highest; the part on the left bank is a suburb which contains about one-third of the whole population of the place; the two are connected by a bridge. The principal line of street is that which descends one hill, crosses the bridge, and ascends the other; this constitutes the road from Paris to Rennes by Fougeres; the more frequented road by Laval from the mountain is the Colline de la Marche. This principal street is neither wide nor straight, and the slope on the side of the town is so steep that in summer it requires a team of twelve, and in winter sometimes of thirty horses and oxen to draw up heavily laden carriages. Near the church in this street, and a few yards without, there is, or opening divided by a modern town-hall into two parts, one of which is adorned by a fountain. At the summit of the hill on a slate rock is the ancient castle of the dukes of Laval, partly occupied as the town prison. The town-hall or market is separated from the church by a terrace planted with trees and used as a promenade. The town and suburb have each a parish church. The houses are mostly ancient, but the streets are very clean. The population of Mayenne in 1831 was 9796 for the town and suburb, or 9797 for the whole commune; in 1836 it was 9795 for the commune. The principal manufactures are of linens, calicoes, and handkerchiefs. There are three weekly markets: one for linen, cattle, and general commodities; another for grain, which is probably held weekly, and a small yearly fair. The linen manufacture, which is the staple, is carried on not only in the town but in the surrounding districts, and employs 8000 persons; the raw material is chiefly foreign flax. There are, or two or three miles west of the town, a great number of windmills. In the commune there are, according to the recent census, 500 persons; and about the same distance south, the wrought-iron forges of Aron. The town has a subordinate court of justice, an hospital, and a high school. Lassay has handsome market-houses and an ancient chateau. Much building in the archbishop's new town has been going on of late years. There is a considerable trade in wine, which is an ancient manufacture. The town has no manufacture, and the district round it is purely agricultural.

In the arrondissement of Château Gaillard are, Château-Gaillard (pop. of the commune in 1831, 6143, and in 1836, 6296) on the right bank of the river, and the town of Aron on the left; also Erve, Grez-en-Bouère, and St. Denis, in the country east of the Mayenne; and Cras (pop. 2550 town, 3610 whole commune) and Cosse-le-Vivien, on or near the Oudon. Cras has a large market and is subject in right of the archbishop to the town of Mayenne. The market-house is large. The chief trade of the place is in flax. There is good society at Cras; Volney was a native of this place. Cosse-le-Vivien with 1000 to 1200 inhabitants, is situated in a fertile district, and is the seat of a considerable trade in linens.

The chief manufacture of the department is that of linen, including sail-cloth and table-linen. Flax spinning and weaving form the occupation of a large portion of the working class in the arrondissement of Mayenne, the sterile soil of which affords little encouragement to agriculture; but the rate of wages is low, and the intervals of depression to which manufactures are liable occasionally throw the workpeople into great distress. Laval and Mayenne are the chief seats of this manufacture; but the population of the arrondissement is great. The Acts of the inhabitants of the Cour Royale and the circuit of the Académie Universitaire of Angers: and is comprehended in the fourth military division, of which the head-quarters are at Tours. It sends five members to the Chamber of Deputies.

The department was one of the most ancient historic period, in the territory of the Diabantes, the Aviri, and the Andes or Andicavi, three Celtic nations, which under the Roman domination were comprehended in the province of Lugdunensis Tertia. The ancient name of the river Mayenne is, a Romanized form of which was Mediana. Nasodarium (afterwards Diabantes) and Venetium, the respective chief towns of the Diabantes and the Aviri, were within the limits of the department. Of the first, now the village of Jullouls, there are important remains. They consist of a wall several feet thick, with an opening nearly a square of 600 or 700 feet each way, with towers at the sides and at the corners. The walls are scarcely more than seven or eight feet high, and about nine feet thick; composed of layers of square stone, alternating with three or four firsts of brick, and cheaply built. It is one of the most firmly built and best preserved Roman forts in France. Within the enclosure are the traces of buildings probably occupied by the garrison of the fort. A subterraneous apartment was discovered near the fort about sixty years ago, but covered up again to stop the troubles; some visits of the curious. It had a mosaic floor and painted walls. An ancient well has also been discovered, and medals and rings have been dug up. There is at Jullouls a granite rock, presenting a resemblance to a chair, supposed to be a Druidic monument. It is called 'the Devil's chair.' There are some remains of a town supposed to be Vagorium, now called Arve, or Erve, on the river Erve. From this name it has been inferred with much probability that the town of Erve in Gaul, took at a later period the name of the people to whom it belonged. The first syllable of the name Vagorium appears to be preserved in that of the Vaige, a small stream flowing parallel to the Erve, about a mile or two to the east of the town. It is supposed that Erve was named chiefly in the province of Maine, but a small part of it in that of Anjou. [Anjou; Maine.] This part of France suffered much in the Vendee war.

MAYER, TOBIAS, was born at Marbach, a town of Wurttemberg, on the Rhine, in 1743. He was a civil engineer, and held the appointment of inspector of the water-works (inspecteur des eaux) at Esslingen. From him young Mayer received some elementary instruction in the mathematics, but it could not have been much, since we do not know what he was able to do before the year 1765. To gain a livelihood he began teaching the mathematics, and at the age of twenty he studied the principles of gunnery, probably with a view of entering the army. In the year 1746 he took an active part in the establishment of a mathematical and experimental society, whose Transactions he afterwards contributed several interesting memoirs. Among these is one, published in 1750, 'On the Libration of the Moon,' in which, besides treating of the subject, he gives a table of the libration of the Moon for the year 1750, by means of 'equations of condition,' which are now of such extensive and important application. [Condition.] In 1751 he became director of the observatory at Gottingen, and at the same time or subsequently was appointed professor of mathematics at the University of Gottingen. His 'Zodiacal Catalogue' was 'deserving of all confidence' (Delambre), and comprised 998 stars, including those whose correct positions are of most importance to the astronomer. In 1755 he published his 'Lunar Tables' in which he showed that in the year 1761 the moon was forwarded to the London Board of Longitude. By order of the board the accuracy of the tables was rigorously tested by Dr. Bradley, who was able in no instance to detect an error greater than 15 seconds of arc. The 'Lunar Tables' were printed in the London Board of Longitude in the year 1757, and likewise the 'Solar Tables' by the same author in the year 1770. After the death of Mayer the British parlia-

ment, at the recommendation of the Board, paid his widow the sum of 3000l. The original resolution of the Board, dated 9th of February, 1765, recommends that a sum not exceeding 5000l. should be awarded; and Delambre states that a further sum of 2000l. was subsequently paid; but this
MAY

Bay, a spacious inlet of the Atlantic, which, running inland to a distance of fifteen miles, by from seven to eight miles in width, meets the western extremity of the plain at Westport. The mountain groups lying south of Clew Bay cover the entire barony of Murrisk, and stretch beyond the bounds of the county into the highlands of Joyce Country and Conmara. [GALWAY.] Mays: died at Göttingen on the 20th of February, 1762. His eloge was spoken by Kaestner (Göt., 410, 1762). In 1891 a simple monument was erected to his memory at Göttingen, the place of his interment.

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MAYNOOTH. [KILDARE.]

MAYO, a maritime county of the province of Connaught, in Ireland, bounded on the north by the county of Sligo, on the west by the counties of Mayo and Roscommon, on the south by the county of Galway, and on the east by the counties of Sligo (from which it is separated by the river Moy) and Roscommon, the south-west, the Blackwater, the valley of which is formed for the Irish race over车厢 in 1836. It lies between 53° 27' and 54° 19' N. lat., and between 8° 31' and 9° 20' W. long., and extends from Achill Head on the west to the junction of the Sligo and Roscommon boundaries at Ballaghaderreen on the east, 72 statute miles, and from the centre of Loch Corrib on the south to Drumnahawk Head on the north, 58 miles. The length of the coast-line from the mouth of the river Moy on the north-east to the head of the Killery Harbour on the south-west, exclusive of the minor indentations of the shore, is about 250 statute miles. The sea, as surveyed by the ordnance survey, has not yet been made public. According to the map constructed under the superintendence of the Society for the Diffusion of Useful Knowledge, it contains 1,625,273 English acres, or 1,298 statute miles. Acres.

Character of cultivable and unprofitable bog and mountain.

| Cultivated land | 871,984 statute acres. |
| Unprofitable bog and mountain | 425,124 |
| Water | 57,940 |

Total 1,355,048 statute acres, or 2,217 statute miles. The largest county in Ireland. In 1831 the population was 367,926.

Large, diversified surface, embracing a part of the great inland plain which extends across the centre of the island, together with a large extent of wild and mountainous country interspersed between the western verge of that plain and the sea. The mountain region consists of two principal districts, separated from one another by Clew Bay, a spacious inlet of the Atlantic, which, running inland to a distance of fifteen miles, by from seven to eight miles in width, meets the western extremity of the plain at Westport. The mountain groups lying south of Clew Bay cover the entire barony of Murrisk, and stretch beyond the bounds of the county into the highlands of Joyce Country and Conmara. [GALWAY.] Mays: died at Göttingen on the 20th of February, 1762. His eloge was spoken by Kaestner (Göt., 410, 1762). In 1891 a simple monument was erected to his memory at Göttingen, the place of his interment.

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south-west, from the valley of the Moy to the head of Clow Bay at Newport. The highest point of this range is 1653 feet. Corresponding in direction with the Croghe Moyle range is the group of Nephin, which extends from Loch Foygh, near the northern shore of Clow Bay, at a distance of about five miles from the eastern range, to the western shore of Loch Conn. The chief summits of this range, commence from the head of the Moy. On the northern side of the Tyrawley and Nephin Beg chain are numerous lakes, between which and the south-westward to Clow Bay at Newport, and Loch Lavalla, which discharges itself north-eastward into Loch Conn, the latter lying within the mountain-pass of Berinna, which has sprung up since 1845, now consists of two streets tract of comparatively level but extremely desolate moorlands, bounded towards the east by the fertile valley of the Moy, and westward by the nearly semicircular amphitheatres of the Tyrwald and Nephin Beg mountains. A subordinate and nearly parallel range divides this tract into two portions, the waters of one of which flow eastward by the Deel river to Loch Conn, and those of the other, passing through a gap in the centre of the range, run westward by the Owenee river to the head of Blacksood Bay. From the summit of this pass, the river Owenee rises about 900 to 1200 feet; south of the valley of the Owenee the heights here are Slieve Cor, 2365 feet, Nephin Beg, 2012 feet, and Cuscamacarragh, 2262 feet; the last rises immediately over the shore of Clow Bay, from which point the range takes westward direction, occupying the entire promontory of Coorean and Corrin, forming the back of a very bold eminences throughout the large island of Achill, which is separated from the mainland by a very narrow sound running up between Clow Bay and Blacksood Harbour. The surface of Achill Island is extremely mountainous, and its capabilities for agriculture are in equal extent of the British islands. At Minnaun, on the south side of the island, the cliffs, which are slightly overhanging, have an altitude of 1000 feet and upwards; and at Keem Head, which terminates the island westward, has an altitude of 1100 feet; and a shelf bearing and by a narrow sound running up between Clow Bay and Blacksood Harbour. The surface of Achill Island is extremely mountainous, and its capabilities for agriculture are equal extent of the British islands. At Minnaun, on the south side of the island, the cliffs, which are slightly overhanging, have an altitude of 1000 feet and upwards; and at Keem Head, which terminates the island westward, has an altitude of 1100 feet; and a shelf bearing and by some convulsion of nature, constitutes one shelving precipice of 2222 feet, springing immediately from the water's edge. The island is of a triangular shape, the northern and eastern sides being fourteen and twelve miles in length, and the south-west, being the northern side of the island constitutes the southern boundary of Blacksood Bay, a great arm of the Atlantic Ocean. Included in this wide district is Eris, which stretches westward from the chief of Nephin Beg mountains on one side, and the low peninsula of the Mulllet on the other. The Mullet, extending fifteen miles in length, is connected with the mainland of Eris by an isthmus five miles long by one mile on an average in breadth, which separates the head of Blacksood Bay from the head of the Bay of Broadhaven, included between the Mullet and the mainland in a similar manner on the north. The thriving little town of Belmullet is situated on the narrowest part of the isthmus, rising in height, the surface of the island is better tilled and less desolate than the mainland; there is a considerable village on it, called Binghamstown, near the head of Blacksood Bay; and Major Bingham, the chief proprietor, has a permanent residence farther south. The surface is very much enlarged, with the western shore, the surface is varied on the north by some considerable eminences, of which Slieve More, 432 feet in height, rising over the western entrance to Broadhaven, is the chief. From its comparatively level surface and the facilities for procuring sea-weed and sand for manure, this remote district possesses great capabilities of improvement; but the immense tract of bog and mountain interposed between it and the market-towns of the interior has hitherto been a great obstacle to traffic. Nevertheless the town of Belmullet, which has sprung up since 1845, now consists of two streets tract of stiled houses and a near square, and has a yearly increasing export of grain. During the period of railway speculation in Ireland, a few years ago, Belmullet was much spoken of as the terminus of a great western railway, by which it was proposed to open the vast desolate tract lying between it and the valley of the Moy, but the design has not been encouraged. Nothing can exceed the bleakness and sterility of the entire tract lying between the shores of Blacksood and Broadhaven bays and the valley of the Moy. One of the upper tributaries of the Tyrawley and Nephin Beg chain are numerous lakes, between which and the valley of the Moy, which runs south-westward to Clow Bay at Newport, a large district of Ballycroy, where some herds of the red deer still survive. This part of Mayo has recently become pretty well known, as the scene of an interesting work entitled 'Wild Sports of the West.' The remaining part of the county, consisting almost wholly of open undulating plains, is divided by a low range of eminences running south of Castlebar into two principal districts, the waters of which run north-north-eastward into the Moy to the sea at Killalla, and of those of the other southward to Lochs Macon and Conn, and so to the sea at Galway. The district immediately surrounding Westport, the waters of which run westward into Clow Bay, is comparatively of inconceivable extent. The valley of the Moy from the sea to Foxford, which is situated fifteen miles north of Westport, is open and fertile, affording improved and improving land, especially in the neighbourhood of Killalla and Ballina. Ballina, the third town in the county, about six miles above the estuary of the Moy, is a small borough of some 600 inhabitants. With the county of Mayo and partly in the county of Sligo, the port, on the north side of the river, which is within the latter county, being called Ardarae. Ballina is of recent origin, there having been no town here prior to 1729, when Lord Tyrawley gave the first impulse to industry in this part of the country by establishment of a cotton factory. The prosperity of the town has however been mainly owing to the enterprise of various traders who have been induced to settle here since the beginning of the present century in consequence of the local resources of agriculture, and the vicinity of the town being numerous seats of resident gentry. Between Ballina and the range of Nephin is Loch Conn, a fine sheet of water eight miles in length by from one to four in breadth, communicating on the south, by a very narrow strait in the neck of land called the Leacon, with Loch Cullin, a sheet of smaller dimensions, through which it discharges itself into the river Moy close to Foxford. The little town of Crossmolina, on the high road from Ballina to Belmullet, stands at the head of Loch Conn, and is surrounded by a tolerably fertile tract of country. The valley at Foxford is contracted by the approaching ranges of the Croghe Moyle and Slieve Gamph mountains, the latter constituting the western extremity of the Sligo group. The hill of Slieve Carnon, rising to a height of 855 feet, is the only considerable eminence in this district. Running nearly north and south, it separates the vale of Castlebar on the west from the upper part spreading eastward into Roscommon, the former being watered by streams terminating in Loch Cullin, and the latter by the numerous and widely extended feeders of the Moy. The main stream of the Moy, which empties into Sligo Bay, is an open upland valley bounded on the north by the line of the Ox mountains, and on the south by low undulating hills of from 600 to 700 feet in height, skirting the northern verge of the great plain. This vale is thinly inhabited, and on its northern verge the country is more thickly inhabited and more productive. Under these eminences on the eastern verge of the county is the small town of Ballaghaderen. The immediate surrounding districts are thickly populated, and a large market is held on travelling westward and southward into the pastoral tract extending from the Roscommon border on the west, to the vicinity of Castlebar on the east, and the valley of the Moy.
Soldiers on the north to the borders of Galway on the south. This tract, embracing a very large extent of country, is named generally the Plains of Mayo, though the locality to which the name strictly applies is confined to the rich grazing lands immediately south of Sivee Carnon. The small town of Ballybofane is situated on the eastern verge of these plains, Claremorris near the centre, Hollymount on the south, and Ballyglass and Balla on the west. In the neighbourhood of the four last towns are numerous seats of resident nobility and gentry, among which Castlemagner, the present residence of Lord Drury, but Castlemagner is the most conspicuous. The tracts of bog are also more numerous here than in the northern and central portion of the plains, occupying most of the valleys, and in several instances insulating the demesnes of the gentry. The country nowhere presents the desolate aspect which so often characterizes the quantity of timber, particularly about Hollymount and Ballyglass, has a rich appearance, which is considerably heightened by the vicinity of lochs Mask and Carra on the west, and by the extended mountain background on the eastern borders of which is laid out an open fertile district extends along the eastern shore of Loch Mask, stretching inland without any incumbrance of unprofitable land as far as the border of Galway. This tract contains numerous private seats, and the small town of Ballyglass is situated on the north side of the river Erriff, which enters Loch Mask; Cong, situated on the narrow neck of land dividing Loch Mask from Loch Corrib; and Shrule, a poor village on the Galway border near Headford. The structure of the isthmus on which this tract is situated is remarkable, the waters of lochs Mask and Carra passing by a subterraneous channel, which can in some places be approached by natural caves in the limestone rock at a depth of forty feet from the surface, to the lower basin of Loch Corrib. This scenery is in no way less striking from the extent of water on all sides, and the grand mountain boundaries rising immediately over the western shores of both lakes.

The district surrounding the head of Clew Bay contains the parish of New Abbey on the north, and that of Newgale, the form situated at the mouth of a small stream running into the south-eastern angle of the bay, and the latter on the river which discharges the waters of Loch Beltra into its north-eastern angle. Westport is a well built and handsome town; two of the principal streets run parallel to the river from the borders of which are laid out as a public walk, with rows of trees. Westport House, the residence of the marquis of Sligo, by much the finest mansion in the county, stands in the immediate vicinity of the town, between it and the sea. From Westport to Newport, the road is studded with green and verdant islands, varying in size from a few acres to half a mile in length, and in number amounting to 170. The shore along the head of the bay is also good arable and pasture land, and is worn into numerous peninsulas and low promontories by the wind and water, without occasioning the picturesque effect. On one of these promontories is the residence of Sir Samuel O'Malley, Bart., a considerable proprietor; and at Newport also, close to the shore, is the seat of Sir Richard O'Dein, another owner of large tracts in the neighbourhood. The whole scenery of this district is remarkably striking; the beauty of the head of Clew Bay, with its labyrinth of islands, in particular, would appear to have been generally known from an early period, as they are distinguished as the "Fortunate Islands," in an Italian map of the sixteenth century.

The only harbour generally frequented on the northern coast is that of Killalla, formed by the embouchure of the river Moy. The bay is a square of about five miles each way, with a range of sandbanks and islands across the bottom. In this range there are two openings, one forming the bar of the Moy, and the other that of Killalla harbour. Formerly vessels for Ballina entered by the Killalla bar, and sailed by the lagoon at the back of the sandhills to the pool of Moyne, where they were reached by lighters. Through a series of some improvements in the Moy a few years since, the navigation has been direct; and vessels of 200 tons now sail up to within a mile of Ballina. From Killalla bay westward the coast for a distance of twenty miles rises in lofty cliffs, beyond which there is little shelter for craft of any kind. There are coves at Balderig, Port Terlin, and Port-a-cloy, where yawsis can be kept, but these places, being open to the north and in immediate connection with the main sea, are always exposed to a heavy ground-swell. The last, which is a narrow inlet bounded by steep cliffs of several hundred feet in height on both sides, has a depth of twenty-four fathoms at its mouth, and four fathoms close in-shore. This iron-bound coast continues to Bonwee Head, between which and the north-eastern extremity of the Mullet is the entrance to a bay known as the south channel of Clew Bay, which constitutes the harbour, the entrance to the latter being somewhat less than half a mile in width, in four fathoms water. The landlocked basin within runs up seven miles to Belmullet, and affords good anchorage throughoout. The only use to which the bay has hitherto been put is for the small number of "bord cheaper" boats engaging in the salmon fishery on the estuary of the Moy. The western shore of the Mullet has no shelter for vessels of burope larger than those afforded in western gales by an open anchorage under the lee of the Inismore islands in the offing. The shores of Clew Bay are indented with numerous coves and estuaries, and frequent roadsides and several sheltered spots well adapted for landing cargoes. Of these the principal are Tarmon harbour, Elly harbour, and Sulleen harbour, on the shore of the peninsula; Belmullet and Cleggan, at the head of the bay; and Aasleagh, on the shore of Aasleagh, on the north-east coast, and Aasleagh, on the shore of the mainland. The side of Achill facing the offing of Clew Bay is mostly a cliff with no shelter for any larger craft than boats, which may be drawn up on the beach in one or two coves. The southern shore of Corran Achill is well wooded, and the rocky coast of the river Inagh near the point of Inishowen is a good shelter on the opposite coast of Murrisk bounding the lower part of Clew Bay on the south; but the upper end abounds with a multitude of safe and excellent anchorages. The western coasts of the islands are broken by the creeks of Newport and Westport. The mouth of the bay also renders sheltered for one-third of its breadth by Clare Island, the whole basin enjoys a considerable shelter from the prevalent run of the sea. The remainder of the coast of Murrisk between Clew Bay and the Killery possesses no harbours, but the island of Ininishokan, on the Commonwealth as to be made the site of a small blackhouse, the ruins of which still remain. The Killery harbour has been described under the head Galway. Small pierss have been constructed from time to time, at costs varying from 1800l. to 2000l. at Killasser Blood, Belmullet, Tarmon, Bullsmouth, Achill Sound, Clare Island, Oldhead, Ininishokan, and Bundurra.

The only navigable river in the county is the Moy. An extensive system of inland navigation has been proposed (1854), but, as yet, there are no canals within the county.

In no part of Ireland has the want of good roads been more felt, or have their advantages been more fully exhibited than in Mayo. In 1869 there was no road whatever in the county, except a few paths for the easier access to the settlemeents of such part of the County of Mayo as were near the Tyrawley and the entire term of Erris, a tract equal in area to many of the inland counties, and the district about Ballina was very ill supplied with means of communication. Roads have now been constructed, partly by government and partly by the grand jury assessments, through the several districts, the chief lines being from Castlebar to Belmullet through the centre of Tyrawley, and from Killalla and Ballina eastward by Swinford towards the terminus of the Royal Canal. The other good roads, from Beastown, from Castlebar, and from Ballina by Crossmolina to Belmullet, have also been recently constructed. The district of Murrisk has also been opened by a new and excellent road from Westport to the head of the Killery harbour, where it joins the line of government roads, and extends through the western parts of Murrisk, which are still unprovided with sufficient means of communication, and part of the district lying along the base of the Slioe Partry mountains next to Loch Mask is altogether impassable for carriages. The champagne part of the country, being the continuation of the great line of road being that which leads from Westport and Castlebar through Hollymount towards Tuam.

From the vicinity of the Atlantic and the quantity of wet surface exposed, the climate of the western districts is damp and unhealthy, and a little shelter from the cold wind is a great advantage. In the eastern districts, on the contrary, the climate is mild and healthy. The protection of so great a barrier of mountain in the direction of the prevalent winds, and lying open towards the east and south, enjoys a climate as mild as most of the midland counties. From the remains of submarine forests on the
coast and the quantities of bog-timber found on the sides of the most exposed mountains in Murrisk and Erris, it would appear that trees formerly flourished throughout the western district, where it is found very difficult at present to rear plantations even in the most sheltered spots.

Geology.—The geological structure of Mayo resembles, in its general features, that of Galway, though on an inferior scale. The mountains are composed of rocks skirting the limestone basin. As usual, the champaign district and the field of limestone are extensive, the primary and secondary formations being confined to Erris and western Tyrawei, and Tyrawley only. The limestone rocks extend south. It has been remarked that in many of the western bays of Ireland the rock which forms the bed or bottom of the bay consists of the flints limestone, while the projecting promontories situated to the north and south of each are composed of primary or tertiary strata. This observation is strikingly illustrated in Clew Bay, where the sea reaches to the verge of the limestone plain between lofty promontories of primary rock on each side, the structure of the bottom of the bay being manifested by a multitude of limestone islands ranging round its upper extremity. The eskers which occur throughout the limestone plain near Westport exhibit traces of a current setting towards Clew Bay. Near Loch Conn and Killala they indicate a current running northward in the line of the Moy. The verges of the plain are, as usual, rich in springs and in subterraneous channels, remarkable instances of which occur at Cong, and in the courses of the rivers Ayle and Owenduff, the latter of which has a subterraneous course of two miles near Shrule, where it forms the county boundary with Mullaghmore. A deep flume, descending from Nephin, runs underground for about three miles.

The southern half of Murrisk, embracing the Fernamore, Portree, and Mullagherry, belongs to the great wacke series: towards the plain in the valley of the Ayle, a tract of yellow sandstone lies between the clay-slate of this formation and the flints limestone. Patches of limestone also occur in some places in this valley. The northern districts mainly of mica-slate, and descending from Nephin, runs underground for about three miles.

The coast fishery, which might be rendered very productive, gave occasional occupation, in 1836, to 3768 fishermen. The craft employed consisted of 4 half-decked vessels, 12 open sail-boats, and 62 row-boats. The principal fishing-bank on the north lies between Downpatrick Head and Broadhaven, at about 3 miles from the shore, in 30 to 45 fathoms water, where turbot, sole, cod, ling, haddock, and hake are taken. Between the Sligo of Broadhaven (insular rocks and sunken sand) and the headlands of Clew Bay is another bank, in 18 to 30 fathoms water, on which the same fish abound. From 40 to 50 miles due west of Achill Head some fish are taken [Galway]; but this fishery, requiring vessels of a better sort than are here in use, has been wholly abandoned by the proprietors. In the Belfast Bay and Clew Bay also contain extensive fishing-banks for turbot, sole, plaice, &c., and vast quantities of oysters and lobsters may be taken on the shores of both. The herring-fishery is chiefly prosecuted, in the season, near the mouth of the great Killary harbour.

The principal river fisheries in the county are those of the Moy, Ballycroy, and Newport rivers. The salmon-fishery on the first lets for 1840, per annum; the others are preserved by the proprietors. In the Newport river salmon are in perfect order all the year round.

The condition of the labouring classes is somewhat better in the remote and thinly-inhabited tracts than in the plain. From 6d. to 8d. a day for 100 working days in the year is the average rate of wages in many parts of the south. In some districts the working days do not average more than 39 in the year. There is much wretchedness among the paupers of the north-eastern parts of the county; and although the people of the mountainous western districts, in years of ordinary productiveness, are rather better off with the necessaries of life than the residents on the plain, they have occasionally, especially in Erris and Achill, been reduced to an extremity of distress scarcely ever experienced in any other part of Ireland by famine or other causes.

There is a large number of resident gentility: of the nobility, the marquis of Sligo and Lord Oranmore are the only residents.
The manufacture of linens is carried on to a considerable extent by the country people: the cloth is generally sold green by the small manufacturers, and bleached in other counties. At Belclare near Westport are factories on a large scale for linen and cotton fabrics. There is also throughout the county the usual hemp manufacture of friezes and coarse woollens. In 1831 there were in Mayo 16 bleachers, 10 reed-makers, 1730 weavers, 5 brewers, 11 corn-dealers, 8 tobacconists, 3 maltsters, 58 millers, and 154 cooperers. Mayo is divided into the baronies of Erris (half barony) on the north-west, containing only hamlets and villages: Tyraclety on the north, containing the towns of Ballina, population (independent of the portion in Sligo) 5310; Kilvarren, pop. 1353; and Collooney, pop. 1481: Castletown on the north-east, containing the towns of Foxford, pop. 1069, and Swinford, pop. 813: Castello on the east, containing the town of Ballaghaderreen, pop. 1147: Kilmaine on the south, containing the town of Ballinrobe, pop. 2604, and the village of Shrule, pop. 507: Carru in the centre, containing the town of Castletown (CASTLEBAR), pop. 6373, and village of Minola, pop. 450: Murrisk on the south-west, containing the town of Westport, pop. 4446: and Burnroe on the west, containing the town of Newport, pop. 1225.

Castletown is the only corporate town in the county: its charter bears date the 11th of James I. The corporation is now extinct.

The manufacture of linens is a place of considerable commercial activity. The exports of corn, meal, provisions, and other agricultural produce, in 1836, amounted to 11,600 tons, of the value of 87,805£: the imports in the same year, consisting principally of coal, iron, sugar, flour, seed, tallow, and salt, amounted to the value of 29,517£.

Ballina has also a large and increasing trade in agricultural produce. The exports in 1836 amounted to nearly 9000 tons of corn and meal and 300 tons of provisions, of a value, including a small export of kelp, hides, and feathers, of 70,565£. The imports in the same year were to the value of 13,320£.

The exports from Newport in the same year amounted to the value of 2269£, and consisted wholly of corn. There do not appear to have been any imports. In the same year the exports from Belmullet amounted to the value of 2940£.

Prior to the Union Mayo was represented by four members, two for the county and two for the borough of Castlebar. The representation is now limited to two county members. In 1837 the constituency consisted of 1350 voters. The assessors are held at a general time at the several towns: Castletown, Westport, Ballina, Claremorris, and Ballinrobe. On January 1, 1836, the police force of the county consisted of 7 chief constables of the first class, 2 second-class constables, 46 constables, 203 subconstables, and 15 horse, the cost of maintaining which establishment amounted, for the year 1835, to 10,142£ 13s. 1d., of which 4532£ 16s. 4d. was chargeable against the county. The total number of prisoners charged with criminal offences who were committed to the county gaol in the year 1836 was 1115, of whom 1002 were males and 113 females. Of these 226 were fined, 226 were discharged during that year. There could be read and write at the time of their committal, 506 males and 42 females could read only, 437 males and 53 females could neither read nor write, and of the remainder the information could not be ascertained. The district lunatic asylum is at Ballinalacken, in the county of Galway. The county infirmary is at Castlebar, and there are dispensaries in all the towns and large villages. In 1836 there were four newspapers published in this county, to which 9280 stamps were issued during that year. There are seven barracks in the county, affording accommodation for 1200 men, but they are only partially occupied at present.

Population.

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History, &c.—This county formed part of the grant made to Sir William Fitz-Adelm de Burgho about the year 1180. It would appear that the new possessor had very soon made a permanent settlement, as in the 24th year of the reign of King Henry III., the then king of Connaught made a journey to England to complain of the invasion of his territory by the family of the Burkes. The lord-justice of Ireland was on that occasion commanded to 'root out that unjust plantation, which Hubert, earl of Kent, had, in the time of his greatness, planted in those parts;' but the command was never acted on, Richard de Burgo having obtained a grant of all Connaught after the death of O'Conner, the then king. There is very little known of the subsequent proceedings of the settlers until the period of the great rebellion succeeding the assassination of William de Burgho, earl of Ulster, in A.D. 1333 [BELFAST]. About this time Mayo was a county, as appears by a roll of the 49th Edward III., preserved in the chancery of Ireland. It fell away however from all subjection to the English law immediately after the murder of the earl; for some time the natives of the Burke family, seeing that the entire province of Connaught would be inherited by his infant daughter (who afterwards married Lionel, duke of Clarence, and so gave the crown its title to the inheritance of the person of Henry VII.), seized upon the counties of Galway and Mayo, and, to avoid the consequences of their usurpation, not only cast off all allegiance to the English law, but renounced their English names and habits, identifying themselves and their followers in all aspects with the native Irish. The name chosen was that of Edmund de Burgho, who seated on Mayo, was MacWilliam Oughter, or MacWilliam 'the farther,' to distinguish his family from that of MacWilliam 'the other,' who had in like manner assumed the Galway name. All the followers of the family in the county followed his example. The D'Exesters, or D'Exons, took the name of MacJordan; the Nangies, or family of De Angulo, took that of MacCostello; and of the inferior families of the De Bursgos, some took the names of MacHubbard, MacOfair, MacPhilben, &c. From this time till the reign of Queen Elizabeth the MacWilliam of the day continued to exercise the authority of an independent potentate. Many families from Galway and Ulster put themselves under the protection of the successive chiefs, and it is probably to the period that the first introduction of many of the most prevalent names at present in the county—Blake, Brown, Kirwan, Macdonnaell, &c.—is to be referred. The first step towards the government of the country was made in 1578, when the then MacWilliam, accompanied by the O'Malley and a number of the clan Donnell, came to Galway and made his submission, consenting to pay 250 marks per annum for his country, and to allow his followers to hold by English tenure. This chieftain is described by a person of Henry Sidney, who received his submission, as unable to speak English, though conversing fluently in Latin. The county was shortly after again declared a free ground. The Burkes however soon began to repute under the new government, and, after many complaints, broke into rebellion, in which they were joined by the clan Donnels, Joyce's, and other families in the south of the county. To appease these tumults Sir Richard Bingham marched to Ballinrobe and threw down the fort there, and the same year Sir Walter de Burgh, who was the chief of the Burkes and Macdonnaells, and given the rebels, who had been joined by a body of 2000 Scottish Islesmen, a
signal defeat at Ardnaree, on the Moy, succeeded in restoring the county to tranquility. The old families of Mayo, in general, took part in the rebellion of 1641 and the succeeding wars, and very extensive forfeitures were the consequences. The forfeitures consequent on the war of the Revolution extended to 19,294 acres, of an estimated total value, at that time, of 37,593l. 3s. The families of Burke, Browne, and Dillon were those chiefly affected. During these troubles however Mayo was not the scene of any great event of that kind, since the battle of Ardnaree, being the invasion, by the French, under General Humbert, in 1798. The invading force consisted of 1100 rank and file only; but such was the alarm caused by their unexpected descent, that the whole of Mayo was alarmed, and being joined by a large body of the peasantry, defeated General Lake, at the head of 6000 men, before the town of Castlebar. [CASTLEBAR.] The surrender of the invading force at Ballinaumack however soon restored tranquillity. [LETISTR].

The antiquities of the county are chiefly ecclesiastical. There are round towers at Killalla, Turlogh, Meelick, and Balla. At Cong are the remains of a splendid abbey, originating from the period of the O'Donnells of Inishmore. The remains of Ballinalynnok, in the twelfth. An archbishop-crozier of surprisingly beautiful workmanship, made by command of Turlogh O'Connor, the father of Roderick, the last native king of Ireland, and preserved at Cong until very recently, is now in the possession of the family of O'Malley, and after his death many of the O'Mal- laynok are the ruins of a large abbey founded by the family of Nangle. Very few remains of a Franciscan friary at Moyne, founded by William de Burgo, are still standing. Rossewok abbey, in the same neighbourhood, has joined the remains of the churches of Do Burgh, O'Malley, and Nangle, throughout the county, are enumerated. The military antiquities are not in general of much extent or interest. Carrig-a-Nile, near Newport, is said to have been a stronghold of Grace O'Malley, a daughter of the family of O'Malley, and is still a place of considerable interest. This is now known in Ireland by the name of Giana Naile, and celebrated for her exploits against the English, especially by sea. Doona Castle, on the shore of Tullaghan bay, was another stronghold of the O'Malles, and is still a place of considerable extent: so also is Inver Castle, on the shore of Broadhaven, which probably belonged to the same family. On a detached rock, near Downpatrick Head, are the remarkable ruins of Duobrate, or 'Broken Castle,' so called from certain remains of an ancient building on the cliff, corresponding exactly with other ruins situated on the summit of a detached rock, standing in the sea about 300 yards off, which is hence inferred to have parted from the mainland in some convulsion of nature. None of the other feudal remains are worth notice.

The county expenses are defrayed by grand jury presentations. The amount levied in 1835 was 27,051l. 14s. 1d., of which 6001l. 14s. 1d. was for repayment of government loans, and the rest for the support of public institutions, and salaries, &c., and 6021l. 3s. 2d. for the construction and repair of roads and bridges. [Statistical Survey of Mayo, Dublin, 1802; Frater's Guide through Ireland, Dublin, 1833; Second Report of Railway Commissioners for Ireland; Yorke's History of Ireland; Parliamentary Reports and Papers.]

MAJOR. [BouguGH OF ENGLAND AND WALES.]

MAJOW. [CHEMISTRY.]

MAZARAN. [PERSEI.]

MAZARI, Cardinal. [ANNE OF AUSTRIA; LOUIS XIV.]

MAZEPPA, Hetman (that is, commander-in-chief) of the Cossacks of the Ukraine, has become celebrated by a peremptory and lurid story of a romantic and stimulatory adventure. He was the son of a Polish gentleman in Podolia, and served for some time as a page at the court of King John Casimir (who reigned 1648-1688), where he acquired some education. On his return to his native province he carried on an intrigue with the wife of one of his neighbours. Being surprised by the offended husband, he was bound by his orders, according to the current story, to one of those wild horses which roam in a half savage state, and which are known to turn loose. The frightened horse ran with his unloading burden, till it reached the country of the Cossacks, where Mazepa, who was in a senseless state, was released from his chains and assisted. Being restored to health by the kind treatment of the Cossacks, he served them as a soldier, and rose by degrees to the rank of his supreme commander. This romantic story of the horse seems scarcely credible, and one might reasonably doubt if a man could have escaped such a fate. However it may have been the reasons which induced Mazepa to take that step, he soon distinguished himself by his bodily strength, great courage, natural abilities, and some acquirements, so that he became general-adjunet and secretary of Hetman Samolowich, and was chosen Hetman on the death of the latter. [The Cossacks of the Ukraine, who were organised by King Stephen Batthyany (who died in 1586), rebelled against Poland in 1584, and were unable to maintain themselves as an independent nation; they submitted to the czar of Muscovy in 1593; and after that date, and after his death, the Cossacks were completely subdued.]

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Poisons,' London, 1792; 'De imippo solis et lumin in corpore humano, et morbus inde oriundus,' 1794; 'A Short Discourse concerning Pestilential Contagion,' 1792, which was written at the request of the secretary of state, in reference to the contagious nature of the plague then raging at Marsoill, for which a method was recommended that is the most rigorous measures of quarantine and disinfection. Some papers on Grecian coins struck in honour of physicians, from which he inferred many interesting facts in the history of medicine, and on which he had a long discussion with Mr. Watson's essay, 1749; 'On Small-pox and Measles,' 1745; containing a full account of inoculation, of which he had witnessed the effects in the admittance of prisoners. 'Medicina Sacra, seu de Morbis insignioribus qui in Biblis memorantur,' 1748; 'Monita et Praecepta Medica,' 1751, containing a general summary of his medical experience. All these works, both individually and collectively, passed through several editions in this country, as well as in Germany, France, and Italy.


MEADOWS. [Cf. I. 356.]

Meadows are properly low grounds on the banks of rivers, which, being kept moist by their situation, and also occasionally flooded by the rise of the waters, are best adapted for the growth of grass, and are generally mown for hay in the months of June and July. They may be of any extent, belonging to a community or district, in which every inhabitant has a right to send his cattle to graze, under certain regulations, which are never mown.

The number of those who have a right of common pasture is not very great, they frequently agree among themselves to abstain from depauperating the meadows in spring, and, dividing them into portions, each makes hay of his share; after which the cattle are admitted in common for the rest of the season. The first common meadow is converted into a Loomas meadow, that is, a meadow which becomes a common pasture after the 1st of August, this being the time when it is supposed that all the hay has been made and secured.

When the meadow is private property they become much more valuable. The flooding is encouraged or prevented, according to circumstances, and in many cases artificial irrigation is adopted. [Irrigation.] If they are exposed to be too often inundated, they are protected by damps and sluices.

The herbage of low wet meadows is generally coarser and less nutritious than that of those which lie higher: hence upland hay, as it is called, is preferred for the better sort of horses and cattle; but the floods of the meadows, to rise, is often called meadow land when the natural herbage is permanent, and frequently made into hay.

Upland meadows are very valuable, wherever there is a demand for good hay. A considerable degree of attention is required to make them most productive. Not being annually recruited by flooding, they would soon degenerate if some pains were not taken to keep up their natural fertility. This may be done in various ways: the most obvious is to recruit them frequently with the richest animal and vegetable manures, which being spread over the surface at a time when showers are abundant, that is, either early in spring or immediately after midsummer, is washed down to the roots of the grass. A rapid growth is thus produced, which is readily mown by comparison; whereas a meadow which has been manured with that of one left in its natural state. It has been asserted by many agricultural authors that the produce of hay is greater when the meadows are mown every year, provided they be occasionally alternated.

But the productivity of a meadow depends entirely on the circumstances of soil and situation. A meadow, the soil of which is naturally of a rich nature, and adapted to promote the growth of grasses, may, by wanting the inferior qualities required to be occasionally cropped close, to check the growth of the coarser grasses, and to allow the finer to rise. As to the effect of taking off the herbage, it is little different, compared with the hay catted, there is little difference, except that in pasturing the grass is repeatedly cropped close to the ground as soon as it rises to such a height that the teeth of the cattle can sever it. It consequently spreads by the roots, and the pile becomes less. The urine of the cattle greatly promotes luxuriant vegetation in rainy weather, but in dry weather it does more harm than good. The dung, when dropped on the plain, is of little value compared with what it would be if mixed up with straw, earth, or peat, or diffused through water in a tank. It is therefore an excellent practice to employ women and children to collect the fresh dung in the pastures, and to carry it to a heap of earth where it may be covered up, or to a tank where it may be diluted with water.

Of late years the practice of sowing has been extensively adopted; that is, all the grass is mown and carried away, in a green state, to cows or horses tied up to the cart. By this method a stock of dry hay for hay is obtained, besides an abundant supply of rich manure, which can be applied to the land in a liquid and diluted state, when its effect is powerful and certain. So much more valuable is produced from the land by this art, that arable fields are converted into artificial and temporary meadows, in which the different species of grasses are sown, in order to be cut green or made into hay; and when, from the nature of the soil, the herbage degenerates, the field is优势 greatly improved by this change of cultivation. [Grass Land.]

When a natural meadow has been neglected, and the grass is of an inferior quality, and mixed with rank weeds and moss, it requires much care to restore it to its original form. When grasses are ranging in the meadow, the best is to plough it up, clean and manure it during a course of tillage, without taking very exhausting crops from it, and then to lay it down again in a clean and tilled state. But where it is of the short sort of grasses, which is preferable, by inoculating, or planting in it small tufts of grass from some rich meadow, which will soon increase, and produce a new and improved sward. But where the soil is a very stiff clay, with only a small depth of good soil, and other circumstances, the old old, for it will take a long time and much manure to reproduce a proper covering of grass. In this case it is a preferable practice to scarify the meadow, by means of instruments which do not go deep, but only tear up the surface. It is done early in the year, when the ground is moist, and the whole surface is brought to resemble a fallow field. Good grass seeds may be immediately sown. But if rich manure, mixed with lime or chalk, is then spread over the land, and the whole well harrowed and rolled, the old and young grass will spring up together, and show a wonderful improvement in a very few months. It is prudent to mow this renovated meadow before the seeds of the grasses are formed, contrary to a common notion that in a good meadow one mow before the other. By this method the old sward, for it will take a long time and much manure to reproduce a proper covering of grass.

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It must be observed that it is not indifferent what cattle are turned into the meadow after hay-making. Horses invariably produce coarse weeds by their dung and urine: cows may be depauperated in autumn, as long as the surface is not plowed, but sheep are far more advantageous, and may be kept in the meadows at all times, if they are not too wet for the health of the sheep, and if there is no danger of their having the rot. As soon as the surface becomes soft and muddy, no cattle should go on the meadow, because every tread of a horse or cow at this time destroys a portion of good grass, and makes a hollow, in which the water remains, killing the finer grasses, and producing rushes and aquatic plants.

The hay, which are to be mown should be shut up early in spring, and those which are soft and wet should have nothing larger than a sheep in them from November till after hay-making time the next year.

MEAN. By the mean of two or more quantities is meant the intermediate quantity determined by mathematical rules. There are more ways than one of finding a mean, but the two principal results of this kind are called the arithmetical and the geometrical means. The names are not properly descriptive of the distinction between them, but they are established by use.

An arithmetical mean is the simple average, formed by...
adding the quantities together, and dividing by the number of quantities. A geometrical mean is the square root of the product of the quantities. Generally, let there be a number of quantities, \(x_1, x_2, x_3, \ldots, x_n\), and let \(\phi(x_1, x_2, x_3, \ldots)\) be a function of them which is symmetrical, that is, which remains the same if the quantities are interchanged; then if \(y\) be found from the equation

\[ \phi (y, y, y, \ldots) = \phi (x_1, x_2, x_3, \ldots) \]

\(y\) may be a species of a mean.

The arithmetical mean, or average (which is always to be understood when the word mean is mentioned, unless the contrary be specified), is taken to be the most probable result of a large number of independent observations which would have been the same but for errors of observation or experiment. Thus if three measures of the same length give 122, 123, and 123.4, the mean of which is 122.8, it is presumed that 122.8 is more likely to be the real length which was attempted to be measured than any other. We confine ourselves in the present article to pointing out how it may be ascertained what degree of probability belongs to such results.

In assuming the average as the most probable result, it is presumed that any one measurement is as likely to err one way as the other; that is, as likely to be too small as too great. If nothing but results be known, this presumption is justifiable; but if it be known that there is more tendency to err to one side than to the other, the most probable result cannot be ascertained until it is found out by how much the average of a very large number of observations would be affected by this tendency. Say it is known that in the long run the average will be lower by 2 \(\frac{3}{4}\) above the reality to measure too much than too little; then 122.8 - 3, or 122.5, is the most probable result of the preceding three observations.

It is obvious that when observations nearly agree with each other, the average must be nearly the truth required, and the nearer the agreement of the observations, the more nearly. If the observations do not agree well, the average is still more likely than anything else, but not so likely as before.

We now show how, having a number of observations, to determine the probability that the truth is equal to the average, and the degree of nearness to the average. A table must be used, which we here give to a greater extent than we should otherwise do, on account of succeeding articles. Let \(M\) be the average of a number of observations, and let \(M + m\) and \(M - m\) be the limits of which it is required to know what is the chance of the truth being between them. Take the difference between \(M\) and each of the results of observation, and add the squares of these differences. Multiply 100 times the number of observations by \(m^2\), and let the sum so found: take the number nearest to the result in the column marked \(A\), and opposite to it in the column marked \(B\), will be found the number of chances out of 10,000 for the degree of nearness required.

Suppose, for example, that seven observations give 10.03, 10.71, 10.98, 10.26, 10.20, 10.72, 10.81, the average of which is 10.54, differing from the respective observations by -0.17, 1.94, -2.24, -3.18, -1.11, and -2.78, the sum of the squares of which is 7239, twice which is 14478, the square root of which is 120.35. Let it be required to find the probability of the truth lying between 10.54 - 0.06 and 10.54 + 0.06, we have then to multiply 700 by 0.06, which gives 42, and to divide by 1,203, which gives 34.9. Opposite to 35 in the column \(A\), and divide 794, so that 3794 out of 10,000, or 3794 to 6296 is the chance of the result lying between the limits given: that is, nearly 31 to 19 against it. If the limits proposed had been 10.54 - 1.10 and 10.54 + 1.00 multiplied by 1 and divided by 1,203 would have given 93.9. Opposite to 94 in the table, the table shows the weight is 5879 to 4121, or about 59 to 41, in favour of the result lying between 10.54 - 0.44.

In the preceding rule it is supposed that all the observations are equally trustworthy, or that there is no circumstance which would beforehand lead us to suppose that any one is more likely to be true than another. If this not be the case, no rule can be applied except one which depends on the observer's judgment. He must make the different observations multiply different numbers, allowing any one observation to count as more than one, if he believes it to be better than the rest. Thus suppose three observations to give 25, 31, and 29, and that it is thought there is reason to prefer 25 to the others, and 29 to 26, so that 25 is given the same weight as 29, and 26 is given the same weight as 25, the table shows the weight is 43 to 56, or 25 to 29, which divided by 8 + 6 + 4, or 18, is 27 to 89, the most probable result. In finding the probability of the truth lying within given limits on one side or the other of the most probable average, let the average be M as before, the limits M + m and M - m; take the difference between M and each of the results of observation, multiply the square of each difference by the weight of its observation, and add the results. Multiply 100 times the sum of the weights by \(m^2\), and divide by the square root of which is 6, and 100 times the sum of the weights, or 1800, multiplied by 2, is 360, which divided by 6'6 gives 54.6. Opposite to 55 in column A we find 5653 in column B; that is, we have 5653 to 4357, or about 56 to 44 in favour of the truth lying between the limits specified.

The inverse problem is as follows: given the observations, required the limits of difference from the average between which it is a given chance, as 6, that the truth shall lie. In both cases the first process is to turn a decimal into a decimal of four places, and to take the numerator of such fraction.

Look for the numerator in column B, find the number nearest to it, and take out the number corresponding in column A. Multiply this by the present rule, and divide by 100 times the number of observations, or, if they are not equally good, by 100 times the sum of the weights. The quotient is the answer required. But when, as most frequently happens, no number of chances has been given, use 47 and 7 instead of the number found in column A.

In the first of the given instances it is required to know within what limits it is 99 to 1 that the truth is contained. Here 99 : 99 to 100, and looking through column A we find 9899 opposite to 102 in column A. Multiply 102 by 1,203, which gives 218946, which divided by 700 gives 313, so that it is 99 to 1 that the truth lies between 10.54 + 313 and 10.54 - 313.
In the second instance, required the limits within which it is even chance that the truth is contained. Multiply 47-7 by 6-6, and divide by 1800, which gives '175; and it is an even chance that the truth lies between 27-89 + '175 and 27-89 - '175.

The amount of departure from the average within which, on this principle, it is an even chance that the truth shall lie, is called the probable error of the observation or average of observations to which it refers. When the probable error of any one observation is given, that of the average is found by dividing it by the square root of the number of observations. Thus if there be 100 observations, of each of which it is an even chance that it is within 1 of the truth; then the square root of 100 being 10, and 1-10 being 01, it is an even chance that the average of the hundred is within 01 of the truth.

For further account of the matters contained in this article, see Probabilities, Theory of; Observation; Risk.

For description of methods without demonstration, see Larmor's Cabinet Cyclopædia, or Manual on Probabilities. For demonstration, see the works of Laplace or Poisson on Probabilities, the article 'Probabilities' in the Encyclopaedia Metropolitana, or Mr. Galloway's article on the same subject (published separately), in the Encyclopaedia Britannica. The take may be found by reference to the first and second last articles cited, and also in the Berlin Astronomisches Jahrbuch for 1834.

MEANDRINA, a genus of Lamelliferae corals. [MAEDEPHYLLEX.]

Morbilli, Rubella, is the popular name of a contagious disease, characterised by an eruption on the skin, and affecting chiefly children.

The etymology of the word measles is uncertain, but its application to the disease we are treating of was probably borrowed from an appearance so denominated, in which the eruption bears resemblance. Measles is ushered in by more or less fever, a running from the nostrils and eyes, with some inflammation of the latter, sneezing, hoarseness, cough, and sometimes a sensation of respiration and occasional slight soreness of the throat. From three to six days after the commencement of these symptoms a rash begins to appear, which first shows itself in distinct, red, and nearly circular spots, having some resemblance to flea-bites: these spots gradually coalesce and form small slightly elevated patches of an irregular figure, but approaching nearest to that of semicircles or crescents. The patches first show themselves on the forehead and face, and gradually extend downwards to the trunk and extremities. At the commencement of the eruption, the symptoms and fever are somewhat augmented, and during its height the whole face is often swollen and the eyelids thereby closed; on its decline, which begins on the fourth or fifth day, the fever ceases, and from this time the body prevails, and by eruptions the cuticle separates in small bran-like scales. A diarrhoea now commonly supervenes, and affords relief to the other symptoms. This however is the period when the danger, which is a consequence rather than a concomitant of measles, commences. The cough, which has continued throughout the active period of the disease, now assumes a more serious character; the expectation, which hitherto had been simply mucous, indicative of the inflammation being confined to the mucous membrane of the bronchial tubes, becomes bloody, or mixed with pus, showing either that inflammation has attacked the proper substance of the lungs, or that tuberculous deposits have taken place in these organs, constituting pulmonary consumption. If the patient happen to be debilitated, less of it is to be dreaded, not unfrequently show themselves, among the most severe of which are obstinate ophthalmitis and inflammation of the internal parts of the ear, the former not unfrequently terminating in partial or total loss of vision, and the latter in deafness, which the aforesaid physicians have expressed how they that this is a picture, rather of what may and occasionally does happen, than of what takes place in the majority of instances; such severe terminations of the disorder are contained in the old writers, and is little likely in the case of the old and to the more sickly ones of the opulent. Measles frequently occurs as an epidemic, in this country usually at the beginning of spring. These epidemics vary considerably in character, being sometimes benign, at other times very furious, and in some particular ways as a preventive of small-pox; but the latter disease, measles rarely attacks the same individual twice. Experimental have been made to determine how far inoculation with the blood of the parts on which the eruption appeared might succeed in moderating the violence of the disease thus artificially produced; but the cases in which it was tried were not sufficiently satisfactory to warrant its general adoption. Beasts, before the outbreak of fever, may be mistaken for several days, for an eruption; but the eruption itself is liable to be confounded with that of Roseola, Sciaratina, Strophulus, Lichen, Urticaria, incipient small-pox, &c.; but the crescentic shape of the patches and the catarhal character of the other symptoms are sufficient to distinguish it from the nature of the disease. With respect to the treatment, little is required during the eruptive stage of the disorder, which is seldom attended with danger. It is chiefly necessary to open the bowels, to confine the patient to a light vegetable diet, with a little raw milk, and to keep him in a cool temperature in the room, which should be moderately darkened. Where the skin is dry and hot, sponging it with cold water has been recommended and practised with benefit.

The old practice of confining the patient in heated chambers, and covered with an overbearing quantity of bed-clothes, is now justly abandoned: the free use of the lancet during the eruptive period of the disease is likewise laid aside, and its employment restricted to those cases in which it is necessary to rid the patient of the exudation which is attacked by inflammation. Should this take place, blood-letting by lancet, cupping, or leeches, aided by blisters and such medicines as act most efficaciously in reducing inflammation, must be had recourse to. Cases in which the vital powers are exhausted; in which the disease has been applied, of course will require an opposite mode of treatment, as the exhibition of bark, the mineral acids, and wine, together with a nutritious diet and a pure atmosphere: these too are the remedies which prove most serviceable in checking the disease, and are commonly prescribed in pernicious cases.

MEASURE. One number or magnitude is said to measure another, when the first is contained an exact number of times in the second. [INCOMMENSURABLE; PROPORTIONAL.

MEASURES [STANDARDS; WEIGHTS AND MEASURES.]

MEATH, formerly distinguished as EAST MEATH, an Irish county in the province of Leinster; bounded on the north by Monaghan, on the north-east by Louth, on the east by the Irish sea, on the south-east by the county of Dublin, on the south by Kildare, on the south-west by King's County, on the west by West Meath, and on the west by Cavan. Its form is very irregular. Its greatest length is from the coast of the Irish Sea near Gorey to the bank of the Shannon, 80 miles; its greatest breadth, at right angles to the length, is from the border of the county of Monaghan on the north, to the junction of the three rivers, the Boyne, Shannon, and Slieve, 39 or 40 miles. The area of the county of Meath is estimated at 486,738 statute acres, or nearly 764 square miles. The population by the census of 1831 was 176,826, giving 231 inhabitants to a square mile. In size it may be compared with the English county of Westmorland; in density of population, with Northampton; and in density of population, with Durham. Trin, the assize town, is about 25 miles north-west of Dublin.

MEASURE. [Coast-line; Geological Character.]—The loftiest elevations are in the western part of the county, just to the south of the Cross-water stream, which separates this county from Cavan. The principal hill is Slieve naillagh, near the village of Lugnagh, between Old and Newmarket-on-Fergus. There is another peak also in the north-east part of the county, on the north bank of the Boyne about Slane and Newtowne Fortescue. Various other parts of the county are hilly, but not so much as the districts just mentioned. [Map subjoined to Railway Commissioners' Second Report; Population Returns.]

The coast has a tolerably straight outline running south by east from the mouth of the Boyne to the boundary of the county of Dublin near Gormanston. The shore is low, and is rendered picturesque by the rocks or hills, and broken by one or two small streams which flow into the sea.

The county of Meath is for the most part included in the

We take this from the Parliamentary Returns. The table given with Mr. Larkin's Map published by the great jury of the county, &c. [1819], makes the county about 473,000 acres; and the other county and statistical society; the latter was published by the society for the Diffusion of Useful Knowledge, &c. All acre.
great central carboniferous limestone district of Ireland; the whole of the southern part of the county, and consider-
able portions of the north and west, are occupied by this formation. The limestone districts are sea at Motivev low and flat, as they usually are in Ireland, while in England they have, from their ruggedness and elevation, given to their component rocks the distinctive designation of moun-
tain limestone. A part of the Meath limestone-beds become occasionally quite impure, and they contain forma-
tions of impure black argillaceous limestone with black shale containing balls of grey ironstone. From beneath the beds of the calp series, those of the lower limestone crop out. It is probable that from beneath these the lowest series are exposed, and are caving out near the limits of the limestone district; this lowest series consists chiefly of a yellow sandstone, sometimes inter-
stratified with dark-grey shale and dark-grey limestone; in some localities they are very thin beds of sandstone.H.

The billy parts of the county belong to the transition dis-

tRICT, which extends from the coast of the county of Down into the counties of Longford and Roscommon. The rocks of this district are greywacke slate, flaky slate, flint-
slate, and chlorite slate, with a thin chalk, insulated in the midst of this transition district, is occupied by the rocks of the limestone formation already described, and by a small coal-field, the beds of which rest upon the limestone. This coal-field is partly in the county of Monaghan, partly in that of Cavan, and partly in that of the county of Cavan, which has been made, but not coal worth working has been found. (Irish Railway Commissioners' Second Report, Appendix; and Geologica1 Map.) Limestone and marl are abundant.

Rivera.—The county belongs almost entirely to the basin of the Liffey, and all but a very small part of the county belongs to that of the Dee; the heights about Slane separating the two. The southern and south-eastern borders are watered by the affluents of the Liffey, or by some smaller streams which flow into the sea between the Liffey and the Boyne.

The Boyne borders the county at its south-
western extremity, and after dividing it for a few miles from the county of Kildare, passes within the boundary and sinks below the coast on the west, where it receivs the Blackwater, its chief tributary. The Monagh (which skirts the south-western border of the county till its junction with the Boyne at the spot where the latter first touches the border), the Blind, the Blackwater (which divides the county of Cavan in two), and the Deel, all small streams, join the Boyne before it receives the greater Blackwater. From the junction of the last, the Boyne flows east-north-east by Slane to the border of the county, and thence along the border (separating Meath from Cavan) and into the county below Drogheda. The length of that part of the Boyne which is in the county of Meath or upon the border is about 56 miles. It is navigable in the natural bed of the stream to above Drogheda (where it is crossed by a bridge), and afterwards partly in the natural bed and occasionally by a lateral cut or canal, to the junction of the Blackwater at Navan, about 23 miles from its mouth. The Blackwater touches the county by the border of the county on the north-west side of the junction of the Crosswater, a small brook which, as well as the Blackwater itself, separates Meath from Cavan. The Blackwater soon quits the border and flows east-south-
east, 18 miles, into the Boyne at Navan. It passes near the town of Kells. It receives a considerable stream, to which the name of the town of Kells is probably due. The county is also rich in mu.

The Nobber rises from some bogs and small lakes on the northern and eastern borders of the county. For the most part the Nobber forms a winding course, first south-east, then north-east until it quits the county to enter that of Louth, where it unites with the Dee. Its length in this county is about 18 miles.

Lakes. There are several small lakes. Lough Sheelin is situated at the western portion of Meath and West Meath from that of Cavan, and is of oval form, 5 miles long from north-east south-west, and about 23 miles broad. It contains a small island, called Church Island, with the ruins of an ancient castle in most parts of it, and two large lakes, a narrow, and some smaller lakes, are on the western border of the county. The lake of Kilmainham, formed by an ex-
pansion of the river Nobber, is about one mile long and above a quarter of a mile broad. Bogs are numerous, but the aggregate of their extent is small; the largest bog is on the border of the county south-west of Athboy; it is partly in the county of Meath and thence in that of West Meath. (Railway Commissio-
ners' Reports; Lunn's Map.)

Canals, Railroads, and other Communications.—The Royal Canal enters the county near Kilcock (Kildare county), and runs for some miles just within the border, thence passing into the county of West Meath. It is carried by an aqueduct over the nearer Blackwater and by another aqueduct over the Boyne, soon after crossing which it enters West Meath. About 14 or 15 miles of this canal are within the county. It opens a communication between Dublin and the Shannon, near the town of Longford, at the other.

A railroad from Dublin to Drogheda, for which an act has been obtained, is to cross the county from south to north along the coast. The lines laid down by the government commissioners for the railways from Dublin to Enniskillen and Armagh respectively also cross this county. They coincide in the first part of their course, entering the county on the south side near Dunboyne, about 8 miles from Navan, and thence north-west about 20 miles to Navan. Here the lines separate; the former running north about 17 miles, till it enters the county of Louth; and that to Enniskillen continuing to pursue a north-western direction about 16 miles, till it enters the county of Cavan, where it has been made. Great lines are required for the following railway lines across this county. One from Dublin to Sligo and Galway crossing the county from Kilcock (county Kildare), nearly parallel to the Royal Canal, into the county of West Meath. A branch from this line to Trim passes through Enniskillen, and a branch from the Enniskillen line near Kells runs westward into the county of West Meath, joining the Sligo line at Longford. A line collateral to the Armagh line and to the east of it passes near Katoath and Slane, and another line runs from Navan to Drogheda. The principal coach-road is that from Dublin to Drogheda, Dundalk, Newry, and Belfast, with a branch to Armagh. From Dublin to Drogheda this road has two branches, one to Kells, and the other the county of Cavan, thence to Armagh. There are well frequented roads from Dublin to Virgin-

gina, Cavan, and Enniskillen, through Dunshaughlin, Navan, and Kells; from Dublin to Granard by Trim and Athboy, with a branch by Old Castle to Killyshandra; and from Dublin to Longford, Carrick on Shannon, and Sligo by Conard, in the south-west part of the county. A considerable number of passengers travel by the Royal Canal from Dublin and Kilcock to Mullingar in West Meath. The principal roads for the conveyance of goods from Dublin to Kildare belong to the city of Dublin; and from Drogheda (one of the principal ports of Ireland) by Slane to Kells, and by road to Navan. The land traffic on this latter line would probably be greater but for the commu-
nication between the towns of Drogheda and Kells by means of the navigation of the Boyne. There is consider-
able traffic also from Dublin to Trim and Athboy, and thence to Oldcastle; also from Kells to Oldcastle on one hand, and to Ballyborough (county Cavan) on the other. (Railway Commissioners' Second Report.)

The county appears to be on the whole tolerably well

provided with roads. Soil, Agriculture, Condition of the People.—This county has very few mountain-wastes, and the proportion of bog is small. The land is in most part smiling.

There are a few fine domains, especially those of the mar-
quis of Conyngham and of the Launbert family, near Slane, and that of the marquis of Headfort, near Kells; and there are many gentlemen's houses scattered through the county. The soil is good for the most part a loam of the richest character, and in many places of such depth that the turning up of a fresh portion of the soil by ploughing deeper than usual is considered as an efficient substitute for manuring. In some places the soil is marl and clay, mixed with bog-stuff or peat; chiefly used; in others "marl-sand," a valuable mixture of calcareous matter and alluvial deposit, is used; and also lime. The farms vary in size from 2 acres to 3000 acres, but are on the average larger than those of Ireland or England, and range about 140 acres; and tillage farms 20 to 20. The mode of farming, though very slovenly and defective, bears some resemblance to that of England. Summer falls,
though coming into disease, have been considered necessary owing to the rank luxuriance of the soil. The rotation of crops in this area is usually, fallow or potatoes with manure; second year, wheat; third year, oats; and, frequently, fourth year, oats. Larger farmers sow clover the fourth year, which remains one year or more, and is followed by oats; a third year, second crop of clover; and a fourth, wheat the second year. The practice of growing potatoes as a preparation for wheat, instead of leaving the land fallow, is increasing. Flax is seldom grown in large quantities for sale, but small patches for domestic use are generally grown. The loaves are sold at 1s. 6d. and sometimes more, and 2s. 2d. from it in the country. Turnips, mangel-wurzel, vetches, rape, grey and white peas, beans, and cabbages, are cultivated, but not generally; turnips are grown only by the wealthier farmers. Unusual growths are found in the village, and a cabbage-bed set aside for feeding sheep. Cabbages succeed well, the expense of transplanting, and the liability to depredation, are great objections to this crop. The whole quantity of land devoted to green crops is small, in consequence of the abundance of the natural pastures, which are of unequalled richness, and have led the farmers to give their chief attention to grazing. The growth of clover and vetches is however gaining ground.

The quantity of cattle fattened in the pastures of the county is small, but as the cost of land is too high to admit of its being used to breed stock, the cattle which the graziers intend to fatten are collected from various parts. The English long-haired breeds were introduced many years ago, and are common in the bogs and bogs of Meath. The breeds most in request are the Durham 'short-horned' and the Hereford breed for fattening, and the Ayrshire for milk cows. After being bled, the cattle are turned out until they are fit for the butcher. The fat necessary to render the beef marketable is not often designed in May; the stock is then designed to be fattened in the ensuing summer. The best-conditioned of the heifers, which are half fat, are put to the farthest grass, and supply the Dublin market in June, July, and August, when beef bears the highest price. The fat cattle are fattening cattle, and the stock provisions commence in September, and after its commencement the graziers rely chiefly on the northern buyers, which the cattle at the fairs in or near the county, and sell the beef for home consumption, or salt and barter for transportation.

Meath, in regard to the quality of its grazing land, is the first county in Leinster, and grazing is carried on on a large scale. Many persons fatten from 300 to 500 cows in a season or more, and sheep. Oxen are frequently employed in the plough.

On many farms the landlord supplies land, horses, and a succession of cows in milk; the tenant furnishes labour and utensils, and pays for making the hay used by the cow, or for keeping the horse. The latter is hired to another, either is rented out, or sold to the retailers of Dublin, who vend it to the poor. From December to May the dairy-cows are fed on hay, straw, or a mixture of both, and are housed at night.

There are large flocks of sheep kept by the most extensive farmers; the small farmers rarely keep any. A good deal of mutton is fattened, but few of the sheep are bred in the county. They are chiefly purchased at the fair of Balinlassie (county Roscommon) in October; some of these are fed during the winter on rape and turnips, and are sold at Dublin in the spring; the rest are turned out into the pastures previously used for the summer stock of cattle, and are fed in addition with hay. In May and June, after shearing, or perhaps in July or August, they are fat enough for the market.

From the low price of corn and the rise of the value of wool and stock consequent on the more rapid and certain communication with England, grazing has been for some years increasing.

The hay crops are generally inferior. 'Every farmer whoindois a hundred acres and upwards keep one or two mares, which he breeds from, and works to within about a fortnight of the time of their dropping their foals: these he rears up, until in the second year they are strong enough either to sell them in the halter or work them in their own team; from which time to the day of their death they lead a life of hardship, and often of starvation. Bad feeding and hard working in their youth prevent their growing to their full size. A large, long, blood horse, which sells for a high price, is much reared in this county.'
with the day clothes of the family, form the night covering.

The most miserable habitations are in the suburbs of towns and around bogs. Cases of bastardy are very rare, and incur general opprobrium; but this opprobrium falls too heavily and exclusively on the weaker party. Drunkenness is rare among the labourers and their wives; there is more frequent, among the small farmers and tradesmen. (Report of the Commissioners for inquiring into the Condition of the Irish Poor.)

There is no return of the quantity of corn sold in the principal markets for the ten years last before 1836.

Dunbrody, Trum, and Meth are divided into eleven baronies, which, with their relative position, and population in 1831, are as follows:

1. Dease, Lower. Central 3,231
2. Deese, Upper. S. 5,294
3. Deemore or Half Four W. 13,717
Total 17,626

Population.

<table>
<thead>
<tr>
<th>Date</th>
<th>How assized.</th>
<th>Houses</th>
<th>Families</th>
<th>Families chiefly employed in agriculture.</th>
<th>Families employed in trade, manufactures, and handicraft.</th>
<th>Families not included in the preceding classes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1792</td>
<td>Estimated by Dr. Beaufort</td>
<td>22,468</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1813</td>
<td>Under Act of 1812</td>
<td>25,921</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1831</td>
<td>Under Act 55 Geo. III, c. 120</td>
<td>27,942</td>
<td>30,125</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1831</td>
<td>Under Act 1 Will. IV., c. 19</td>
<td>29,796</td>
<td>31,652</td>
<td>25,396</td>
<td>4,575</td>
<td>4,661</td>
</tr>
</tbody>
</table>

Total 176,826

The towns are—the assize, market, and post town of Trim, the market and post towns of Athboy, Duleek, Kells, Navan, Oldcastle, and Slane; the post towns of Ashbourne, Clonard, Clones, Crossakeel, Dunshaughlin, Enfield, and Nobber; and the ex-parliamentary borough of Ratoath. Duleek and Newnavan were formerly parliamentary boroughs.

Trim is partly in the barony of Upper Navan, but chiefly in that of Lower Moyenefrugh, 32 English miles from Dublin in a very ancient town: on the conquest of this part of Ireland by the English, it was conferred, with the rest of the county, on Hugh de Lacy, who made it a free borough. His son Walter gave it a charter of incorporation: and as the head of the lordship of the De Lacy, it acquired importance, and several of the early Irish parliaments were held here. In the civil war of 1642, the Catholics who held it were expelled, and the Parliamentarians garrisoned it under Sir Charles Coote; but he being killed, the place appears to have been lost, for in 1649 it was held by a royalist garrison, which quitted it on the approach of Cromwell, intimidated by the massacre of the garrison of Drogheda.

The town is pleasantly situated on the river Boyne: many of the houses are neatly built, and the environs are pleasant. In the town is one of the stations of the Roman Catholic church; and an ancient castle of venerable appearance; the keep, a massy pile strengthened by four round towers at the corners, is yet standing, as well as several of the outworks. The church is modern, except the tower, which is of great antiquity. There are some remains of an ancient abbey; and a handsome Corinthian column erected in honour of the Duke of Wellington.

The population of the town in 1831 was 3282; 400 of them Protestants, the rest Catholics: that of the outports of the parish, which is extensive, was 2644: together, 5926. The place has been declining for years, and presents on the whole a very impoverished appearance. It has no extensive trade or manufacture; the principal traffic is with Dublin and Navan. The market, which is on Saturday, has increased; there are five yearly fairs. The assizes are held here, and the quarter-sessions for the division twice in the year. The county court-house and gaol are here. The town returned members to the Irish parliament; but was disfranchised at the Union of 1800.

Duleek is in the barony of Lower Navan, on the Nanny or Nannywater. There were antiently three religious houses, of two of which the ruins yet remain; and the town was the seat of a bishopric, ultimately merged in that of Meath. There were, in 1831, 233 houses and 1217 inhabitants in the town; and 733 houses and 419 inhabitants in the whole parish. There was formerly an extensive manufacture of ticking, but it is now much diminished. There is a market on Saturday, and there are four yearly fairs. Races are held in the neighbourhood. Petty sessions are held here, and the town is a station of the Roman Catholic church. There is a modern building; the Catholic chapel is a handsome Gothic edifice, and has a school-room adjoining. There are in the parish several public schools and a dispensary. There are in the town two stone crosses, and in the parish another elaborately carved.

Kells is in the barony of Upper Kells, nearly 40 miles from Dublin through Navan. It is a town of great antiquity, and, previous to the arrival of the English, had a monastery of regular canons. It was fortified by the English with a castle and a wall. The monastery, which had been plundered, was endowed with new grants by Hugh de Lacy; and Walter de Lacy, son of Hugh, founded another monastery for Crouched friars. The town became flourishing, but the dissolution of the monastic establishments and the repeated wars which desolated the country caused its decay.

Kells is pleasantly situated on the south bank of the Blackwater. The principal street is very broad; the streets generally are well laid out, and the town presents a pleasing appearance. The population of the town, in 1821, was 3618; in 1831 it had increased to 4326: the population of the whole parish was 6839. The market, which is held on Saturday, has so increased as to have rendered an enlargement of the market-place necessary. The quarter-sessions...
for the division are held twice in the year at Kelly, twice at Navan. There are a bridewell and a fever hospital. It is the station of a chief constable and fifteen others of the county constabulary police.

A town, consisting of a sovereign, two provosts, and twenty-four burgesses; with a recorder and other officers. The sovereign, the provosts, and a few of the burgesses constitute the common-council or managing body: they are styled the corporation. Kelly renders tribute to a Roman parliament from the time of Elizabeth till the Union. The parish is at the head of a parochial union, both in the Established Church and among the Catholics. The parish church is an ancient building; near it is an ancient round tower 90 feet high. There are two fish crosses, one in the church-yard and one in the street near the market-place; also an ancient stone roofed cell or chapel.

Navan is in the barony of Lower Navan, 29 miles from Dublin, and at the junction of the Blackwater with the Boyne. The principal streets are kept in repair by the county. There are two bridges, one over the Blackwater and the other over the Boyne. There are a court-house, containing rooms for holding the sessions and a gaol, assembly-rooms; a bridewell, a county infirmary, and a fever hospital. The parish church is a neat modern building; the Roman Catholic chapel is an extensive building of Greek architecture. The population of Navan, in 1831, was 2,402, of the whole parish, 2,992. The town is in the centre of a great corn district, and has an excellent corn-market on Wednesday; there is a market also on Saturday; there are four yearly fairs. There are several corn-mills, a linen yarn-mill, and a woollen manufacture near the town. The annual value of the town and parish is £3,600. The corporation consists of a portreeve and twelve burgesses, with a town-clerk and other officers. The portreeve acts as a justice of the peace for the borough conjointly with the county coroner.

A town, returned members to the Irish parliament from the time of Elizabeth till the Union. Petty sessions are held here every fortnight, and the quarter-sessions for the division twice in the year. The parish is at the head of a union, both in the Established and Catholic churches. There are several schools, one of them is a Catholic seminary for youths desirous for the priesthood or either of the learned professions.

Owencarrow is in the barony of Demole or Half Fowre, 59 miles from Dublin. The town comprehends 237 houses, and a population of 1,531; the whole parish has 778 houses and a population of 4,718. There is a church, a plain modern building; a large but plain Catholic church; and a Primitive Methodist chapel. There is a large school-house for the national school, capable of containing 1,000 children. This school has an endowment of 800l. a year. Petty sessions are held here every fortnight; and the market, which is on Monday, is one of the largest corn-markets in the county. There are extensive corn-mills near the town. There are no valuable deer and no deerable limestone quarries and large flour-mills in the parish. The living is a rectory not united; the parish is included in a Catholic union.

Slane is in the barony of Upper Slane, 28 miles from Dublin. In the early ages of Christianity it was the seat of a bishopric. The town is pleasantly situated on the north bank of the Boyne, over which there is a bridge. The surrounding country is rich; and the houses are chiefly modern and elegant. Slane Castle, seat of Sir Robert Conyngham, is on the bank of the river just above the town. The population of the town, in 1831, was 896; of the whole parish, 2,516. The parish is the head of a Catholic union; the living in the Established Church is a rectory in the gift of the crown. There are several schools. There is a group of tumuli in the neighbourhood; the largest is a mound 70 feet high, and having at the top an irregular area, 300 feet in circumference. This mound, when opened, was found to contain the entrance to a gallery leading to a large chamber or cavern. Slane is one of the stations of the county constabulary force.

Ashbourne is a small place in the barony of Ratoath, 13 or 14 miles from Dublin on the road to Londonderry. It is a small parish; 56 houses and a population of 473. It has a Catholic chapel, a neat modern building.

Clondar, in the barony of Upper Moyfennagh, 33 miles from Dublin, was a place of note in ancient times. It had an abbey which became the seat of a bishop, whose diocese was augmented, previous to a.d. 1154, by the addition of the bishopric of Trim, Ardbraccan, Dunshaughlin, and Slane. This diocese was afterwards designated the diocese of Meath, but the cathedral continued to be at Clondar till 1690. The abbey had previously been repeatedly plundered by the Danes or the natives; and about a.d. 1175 Hugh de Lacy erected an Augustinian monastery, probably on its ruins. Clonard was the scene of conflict in the war of 1641 and the scene of the arrest of the bishop, during the suppression of the Catholic police, though a mere village or hamlet of 10 houses and 66 inhabitants. There is a large Catholic chapel in the village, the parish church is half a mile distant.

Clonoe is in the parish and barony of Dunboyne, just within the county Meath; 20 miles from Dublin, on the road to Navan. Clonoe is a station for the county constabulary force. The population in 1831 was 217.

Crosakieel is about 46 miles from Dublin. It is in the parish of Killakey, or Kilakeer, and in the barony of Upper Kells. Petty sessions are held here once a fortnight and it is a station of the county constabulary force; there are three yearly fairs. The parish church is in the village, and there is a dispensary. The population of the village in 1831 was 290; of the whole parish, 4,537.

Dunshaughlin, in the barony of Ratoath, 17 miles from Dublin, was formerly a corporate town. It is now a post town or village of 157 houses and 913 inhabitants for the union, and 527 houses and 2,238 inhabitants for the whole parish. It has a parish church of modern erection, and a Catholic chapel. The petty sessions are held every fortnight, and the quarter sessions for the division, twice in the year. It is a station for the county constabulary force. There is a dispensary in the town, and there are two public schools.

Enfield is in the parish of Rathmore and in the barony of Lower Moyferragh, 26 miles from Dublin, near the Royal Hospital. It is a station for the county constabulary. It had in 1831, 45 houses and 302 inhabitants.

Nobber is in the barony of Morgallion, 40 miles from Dublin. It was an antient fortified town, and was regarded as of importance. It now contains 58 houses and 371 inhabitants; the whole parish has 721 houses and 3,083 inhabitants. The church is a plain neat building; the Catholic chapel is also a neat building of modern erection; and there is a school-house. Near Nobber is a large Danish camp, and in the churchyard are the remains of a structure, supposed to have belonged to the Knights of St. John of Jerusalem. There is a well attended cattle and pig fair. Nobber is a constabulary police station. Carolan, the celebrated Irish harper, was born here.

Ratoath, 15 miles from Dublin. It was a parliamentary borough previous to the union, by which it was disfranchised. There were in 1831, 96 houses and 552 inhabitants in the town, or 283 houses and 1,775 inhabitants in the whole parish. There are three miles of road by which the town is supplied with fuel and of inhabiting and of linen is carried on. It is one of the stations of the county constabulary force.

Ecclesiastical and Legal Divisions. The county is for the most part included in the diocese of Meath; but small portions are comprehended in those of Armagh and Kilmore; all these dioceses are in the ecclesiastical province of Armagh. The county is included in the home circuit. The assizes are held at Trim. The Eastar and Midsummer assizes, which are held at Trim, are attended by representatives from the barony of Ratoath, and held at Kells and Dunshaughlin; the Hilary and Midsummer sessions, at Trim and Navan. Before the Union Meath sent 14 members to the Irish parliament, two for the county, and two for each for Kells, Navan, Athboy, and Dunshaughlin. Ratoath, at present sends only two county members, who are elected at Trim.

The police force of the county on 1st January, 1836, was, 1 magistrate, 7 chief constables, including subinspectors (of whom 5 were of the first and 2 of the second class), 5 constables, 3 clerks of the bar, and 32 constable's assistants. The cost of maintaining the constabulary for 1835 was 11,893. 13. 4d., of which amount 6197. 3s. 4d. was chargeable against the county.
of instruction in trade. There are two schools in the pri-
son, and a treadmill. The bridewells at Navan and Kells are both tolerably extensive prisons, containing sixteen cells, ten isolated, and six in a foully-obliterated mansard. A full classification required by the Prison Act. (Appendix to Fourteenth and Fifteenth Reports of Inspectors-General, 1836.) The number of persons committed for criminal offences in 1835 was—for offences against the person 85 (44 convicted, 41 acquitted or discharged); for offences against property committed with violence 28 (convicted 9, acquitted or discharged 19); for offences against property without violence 107 (convicted 54, acquitted or discharged 53); for malicious offences against property, such as arson, killing or maiming, 2, in possession, 3 (convicted, acquitted or discharged); for forgery and offences against the currency 4 (2 convicted, and 2 acquitted or discharged); for other offences 105 (45 convicted, 60 acquitted or discharged): making a total of 333 persons committed, of whom 135 were convicted and 178 acquitted or discharged. There was no person executed. Of the persons committed, 277 were males (10 of them under 16 years) and 56 females (1 under 16): 71 could read and write, 54 could read only, and 116 were entirely ignorant; of 96 the degree of instruction not mentioned. The lunatic asylum for the counties of Meath, Leitrim, Dublin, and Wicklow, is the Richmond Lunatic Asylum at Dublin. Of 384 patients in that institution on 1st January, in 1833-4, there were 270 under medical treatment, 201 at Navan, and there were, in 1833, fever hospitals at Kells and Navan, and nineteen dispensaries at different places in the county, supported in nearly equal proportions by private subscriptions and grand jury presentations.

Meath has, of late years, been included by Prolemy in the territory of the Ebaunos (Blinian), or Ebaanuos (Eblain), a nation whose sway extended over the neighbouring counties of Dublin and Wicklow, and whose name may be traced in the first syllable of the province of Meath. At an early period Meath constituted one of the kingdoms into which Ireland was divided, and comprehended, it is likely, not only the present counties of East Meath and West Meath, but also the whole or part of those of Longford, Cavan, and King's County. Teamor, now part of County Meath, was held by the kings of Meath in possession of the territory of Meath and Navan, which was the residence of the sovereign of Ireland and the seat of the supreme government, and the place where St. Patrick made his first efforts for the conversion of the Irish to Christianity. It is probable that the kingdom of Meath was erected in the second century of the Christian era as the immediate domain of the Irish monarchs; or if not then erected into a kingdom, was placed under the immediate government of the Irish monarchs, while the rest of Ireland was divided into provinces. At a subsequent period the government of Meath was separated from the monarchy, which was so far weakened by the separation as to become little more than a nominal supremacy; the kings of Meath ranked as subordinate princes, but they continued to hold one of the mansions of Meath, and the Manor of Nialls, by which the supreme government was alternately possessed. Teamor ceased to be the seat of the national government.

In the invasions of the Northmen, or Danes, the kingdom of Meath suffered severely. Turges, a Danish leader, in the early part of the ninth century, established himself at Lough Rive (Rees?), and after cruelly ravaging the kingdoms of Connaught and Meath, was seized and put to death, probably at Lough Urr, near Mullingar in the present county of West Meath, by some of his followers. Afterwards divided his power and authority. The Northmen however soon renewed their attacks, and civil disensions diverted the Irish from resisting the common foe. For several centuries Meath was exposed to their ravages, or those of other Irish princes, and the same war continued.

Traces of this period of confusion exist in the numerous raths and earthworks that overspread the district; and the frequent destruction of monasteries and towns recorded in the annals of the religious houses is another attestation of the prevalence of warfare. The last king of Ireland of the Hy-Níall family was Meaghla II., who, though reduced to a despotic authority for a time in favour of Brian Ború of the Munster, resumed it upon the death of that prince (who fell in battle against the Northmen at Clonard near Dublin, a.d. 1014), and reigned till his own death, a.d. 1022, about 150 years before the invasion of Ireland by Henry II.

Before the invasion of the English, Dermot, and Dermot MacMurrough, king of Leinster, had reduced O'Melaghlin, or Melaghlin, and Meaghla of Meath, and other princes, into a state of subjection; but having roused indignation by the abduction of the daughter of Melaghlin, who had married, O'Ruaire, or O'Rourke, king of Breifne, or Brehy (now the county of Fermanagh), Meaghla and others, aided by his own subjects, and compelled to flee to England to escape their enemies, engaged the Anglo-Normans in the conquest of his native island. Richard, earl of Striguil or Clesiptow, commonly called Strongbow, the leader of these auxiliaries, was quickly joined by the earl of Pembroke, by William FitzOsbern, and by Henry II. as a county palatine (or feudal lordship), the holder of which had several regal rights, on Hugh de Lacy, who was appointed governor of the English pale or district. Hugh de Lacy built a strong fortress at Trim, which was engaged, a.d. 1174, in an attempt which the Irish made, under their king Roderick, to reconquer the country. The Irish were however repelled, and the ruined castle of Trim was restored. De Lacy parcelled out his territories among his followers, whom he vested barons, whence is derived the subdivision of the lands into baronies.

Meath however appears to have passed again into the hands of the natures for; in 1178 De Lacy, who had been reappointed governor of Ireland, and held office for a short time as the King's English lieutenant, resigned to Henry the second, as a county palatine. In the general rebellion excited by the petulance of Prince (afterwards King) John, whom his father Henry II. sent over as governor, Meath was preserved to the English by the valour of William Petit, who held the castle at Navan. In 1205 it was held by John de Courcy, son of Henry de Lacy, who was appointed governor of Ireland, in which office however he was soon superseded, agreeable to the policy, at that day, of his father, which seldom allowed a governor to retain office any length of time. De Lacy, in his character of earl of Meath, was never engaged as an Irish prince for the sovereignty of Connaught; and having been reappointed by King John lord-justice or governor of Ireland, he was defeated by John de Courcy, the Anglo-Norman earl of Ulster, whom he was commissioned to arrest and send over to England. He succeeded however in getting De Courcy into his hands by treachery and sending him over to England. He afterwards received the earldom of Ulster as his reward.

The ambition of Hugh de Lacy, now earl of Ulster, and of his brother Walter, who appears to have succeeded him in the earldom of Meath, having excited the jealousy of John, that king visited Ireland in person (a.d. 1210), and spent some months in reducing the fortresses in Meath and Ulster, and in the person of Walter. Afterwards Walter divided his power and authority between them. West Meath, which fell to the elder, who was married to Sir Theobald Verdon, appears to have been so neglected, and fell into such a state of anarchy, that it did not obey the English laws for above a hundred years. (Baron Finlaggan's Breviet.)

Henry de Lacy's only son was married to a lady of the family of the Boleyn, and his younger daughter, married to Sir Geoffrey Gonneville, was also wrested from its owners, either by native chieftains or Anglo-Norman rivals.

The English dominion, never fully established, appears rather to have declined than to have gained the reigns of the later Plantagenet and the Lancastrian princes, and the civil war of the Roses. The native Irish renewed their incursions; and in a.d. 1329, the English under Lord Thomas Butler sustained a severe defeat from them near Mullingar in the county of West Meath, by William Butler, earl of O'Neale, and were pushed back to the Boyne. (W. M. Le Poer's Irish HIST. Vol. XV.—G.)
appear to have leived a tribute upon the English settlers, in
consideration of leaving them in quiet, similar to the black
mail leived by the Scotch Highland chieftains upon the neigh-
bouring Lowland lairds and tenantry. The county of Meath
paid at one time a yearly pension to the O’Connors of
Gal.

In the reign of Henry VIII., when the power of the
English began to revive, Meath was invaded by an Irish
chieftain named Stories, or Niall, or Con, who
beckily withdrew on the approach of the earl of Surrey,
lord-deputy. In a rising in favour of the Papacy, which
took place at the Reformation, the Irish broke into Meath,
destroyed Navan, and, after mustering their forces at Tarah
Hill, which served as their home, but were
brilliantly routed (A.D. 1539). In A.D. 1540 the natives
assembled in West Meath, with a view to break into the English
pale; but dispaured on learning that preparations had been
made to resist them. Just at the close of the reign of King VII.,
the ancient county of Meath was divided; and West Meath,
including the present counties of West Meath and Longford,
and part of King’s County, was erected into a separate
county. Cavan, which was partly formed out of Meath, was
erected into a separate county by Sir John Perrot, lord-deputy
in the reign of Elizabeth. In the great rebellion of 1641, Meath
was again the scene of hostilities. Trim was entered by
the English troops, who designed to make it a military post;
and an attempt of the Irish to surprise the garrison was
defeated by a bold and successful sortie (A.D. 1642). Sir
Charles Coote, one of the best officers of the English, and
commander of the garrison, fell in the action. In 1643
egotiations for peace between the English and the insurgents
were carried on at Trim. In 1647 Trim was besieged by the
Irish under their general Figennick, and, after a siege of
three months, served as a place of retreat to some of the
Royalists on their defeat at Rathmene near Dublin, in 1649.
but after the storming of Drogheda, and the
massacre of the garrison by Cromwell in the same
year, Trim was surrendered by the Royalists without resi-
sistance.

In the war of the English revolution the battle of
the Boyne was fought (A.D. 1690) close upon the border of
this county, between Drogheda and Slane. The two armies
subsequently crossed the county from north to south, that
of James in retreat, that of William in pursuit. In the
rebellion of 1798 some outreBMg were committed at Dunboyne
by a party of insurgents, who were very shortly defeated
at Ratoath; but the victors having separated, the vanquished
part of the army retired to Dunboyne (A.D. 1798). Some
further outrages were committed at Dunshauglin,
and immediately a considerable part of the population of
the county rose in rebellion: a body of men, 4000 according
to some accounts, took post on Tara Hill, where they were
defeated and 3000 were killed or taken prisoners.

Part of the fugitives took refuge in the bogs, from which
they continued for three weeks to make excursions for plunder and devasta-
tion.

There are several remains of antiquity in the county.
At Tarah, or Taraigh, once the seat of the Irish monarchs,
are considerable earthworks. Two splendid tombs, or cor-
ners of pure gold, were dug up here in 1813. There are
colourful and various pictures. The ruins of the castle of
Slane Castle, which were first built as residences. There
are round-towers at Kells and at Donoughmore near Navan.
There are numerous ruins of ancient monastic edifices: those of the monas-
tery at Duleek, supposed to be the most ancient monastic edifice built of stone in Ireland, present some
remarkable traces of rude architecture. The front of the
ancient cathedral at Clonard yet exists, and there are several
stone crosses. The ruins of Beehive Abbey are extensive and
picturesque.

(Wakefield’s Ireland; Parliamentary Papers: Harris’s Hibermia; Gordon’s and Cox’s History of Ireland.)

MEATH, WEST, or as it is sometimes written in one
word, WESTMEATH, is an inland county of the province of
Leinster, bounded on the north by the county of Cavan in Ulster, from which it is separated by Lough Sheelin or Shillin; on the north-east, east, and south-east
by the county of Meath; on the south by King’s County; on the west by the county of Roscommon in Connaught, from which it is separated by Lough Ree and the river
Shannon; and on the north-west by the county of Longford. The greatest length is, from east-north-east to west-south
west, from the county of Meath near Clonmel to the
bank of the Shannon opposite Athlone, 45 miles; the
greatest breadth, at right angles to the length, is from the
neighbourhood of Kinnegad to that of Rathowen, both on
the mail-road from Dublin to Sligo, 25 miles. The area is
5,377 square miles, or 1,365 English statute acres, or 578 square miles. The population in 1831 was 136,872, giving nearly 237 inhabitants to
a square mile. In area it can scarcely be compared with any
English county; it is larger than Monmouthshire, and less
than Herefordshire. The surface is not less varied, nor is
it less beautiful, than that of either of these counties, but
rather hither Fertile; but in density rather exceeds it.

Surface, Geological Character, and Hydrography.—The county is for the most part a gently undulating surface, not rising in any part to a scarp, hilly height. Inland, 57
feet on the border of Loch Deveragh, is about 856 feet high; Benford, or Ben of Powre, near the village of Powre,
not far from Lough Lane or Lene, is 760 feet high. These,
with the other principal elevations, are in the northern part
of the county. The whole is a part of the central carboniferous limestone district of Ireland. There are two small districts, one just round Moate-a-senne-Gregogue, and the other in the same
neighbourhood, but rather more to the south-west, which
are occupied by the yellow sandstone, a formation consisting
of coarse sandstone, which, by its peculiar colour and
transparency, passes into sandstone. These beds are considered to belong
to the same period as the carboniferous limestone, of which
series of formations they constitute the lowest members.

The whole south of the county belongs immediately to the
basin of the Shannon, which, having separated it from the county of Roscommon. Lough Ree, the
largest of the series of lakes into which that river ex-
pands, is also on the western border. This noble sheet of water, 15 miles long, and varying in width from
seven to nine miles, is one of the most beautiful spots of the
kingdom. It is bounded on the north by the gulf of Lough
Shannon, on the south by the country of Longford, on the west by the small country of Roscommon, and on the east
by the county of Meath. Lough Ree is a very salt water,
not sour or luke warm; and the water is as clear as pure water in summer. The banks of Lough Ree are
bare, but are thickly planted with birch trees; and there
are some small plantations of oak on some of the shores
of the

The district north of the Lough, extending as far as Lough Keilin and Lough Shillin, is almost entirely bog, especially the tract through which the
MEA 43

connecting stream flows. Lough Deveragh receives some small streams; and others, including the Glone, which is the catchet of a small lake, in the north-east of Lough Deveragh, fall into the connecting stream. From the north-western extremity of Lough Deveragh another stream flows south-west into Lough Iron, a shallow lake of about 3 miles long from north-west to south-east, and about half a mile broad. Several streams flow into the connecting stream between Lough Deveragh and Lough Iron or into the latter lake, and carry off the superfluous water of small lakes or bogs. Lough Glyn on the north-west border toward Longford, and Lough Gar, are thus connected with this central system. A small brook forms the communication between Lough Iron and Lough Owhel, or Hoyle, 3½ miles long from north-west to south-east, and about ½ mile broad. The banks of the lake are grassy, and fertile and well wooded. On a small islet in the lake is a rude chapel with a burial-ground, once much resorted to by pilgrims. A supply of water is drawn from Lough Hoyle for the Royal Canal. From Lough Hoyle a small stream flows in a winding channel toward Mullaghar; this stream falls into Lough Ennell, 13 or 5 miles long from north-east to south-west, and above 2 miles broad at the widest part. This lake, sometimes called Bolviders, is studded with small islands. A number of streams flow into this lough.

There are lakes in the county with the Shannon by two different streams. The Lunny flows from the north-western extremity of Lough Iron to the border of the county, which it skirts, and then into the county of Longford, to which it may be considered as chiefly belonging. It flows into Lough Redwater, then into Lough Borough, from the southern extremity of Lough Ennell by Killenberg into King's County, to which it chiefly belongs. It receives a number of small streams, drains the southern parts of the county, and falls into the Shannon in the neighbourhood of Banagher.

A branch of which we have already described is included in the basin of the Shannon, though for convenience the central lake-district has been described separately. The eastern side of the county belongs to the basin of the Boyne. A number of small streams rise in that part of the country and flow eastward into that river: the most important is the Deel, one branch of which rises near Mullagar, and another is the outlet of a small system of lakes near the north-east border of the county. The lakes of this system are Lough Belles, Lough Ballagh, Lough Linn, and Lough-a-Deel within the border: Lough Lena, the largest of the group, is about 2½ miles long from west-north-west to east-south-east, and nearly a mile broad. Its waters are peculiarly clear, and contain several species of fish.

The eastern and south-eastern sides of the county abound with bogs, and some of them are of very considerable extent. The lakes of West Meath abound in pike and trout: the latter are very fine, and form an important article of food. The bogs of Longford are the most picturesque in Ireland. It is considered to be excellent only by Kerry, Fermangh, Wicklow, and Waterford.

Agriculture.—The landed estates in the county are not very large, but there are a number of gentlemen of moderate fortune. In the eastern parts the soil is a heavy loam from 7 to 12 inches deep; the northern parts, which are hilly and adapted for sheep-walks, are chiefly devoted to grazing black cattle. In the western parts the soil is generally light, there being a great deal of bog. The farms do not commonly exceed 15, 20, or 30 acres, and the smaller ones are as small as 10, 15, 7, or even 3 acres. The resident gentry usually farm a considerable portion of their own estates. The average rent of arable land is from 7½ to 10s. net; and the quality will be of 2½ acres, or 2½ acres of inferior quality sometimes for not more than 7½. The system of 40 acres, or lands let to the cottiers for the purpose of growing a single crop of potatoes, is prevalent in almost all parts of the county. (Appendix to the Report on farming into return.) The chief crops raised by the farmers are oats and potatoes; a very little wheat, some barley, flax, rape, and clover are grown. Fences, except in the neighbourhood of demesnes, are generally neglected; in some parts they consist of a few stakes without anything but brushwood upon them. Dairy farming is practised to some extent in this county, but not to such an extent as the nature of the soil would warrant. A considerable quantity of good butter is made, which is sent to Dublin by the Longford. The longhorned cattle are much valued; some of the best specimens are grazed in this county, and all the stock participate in the blood. Sheep are not a common stock, but there are some excellent ones of the long-wooled breed. Pigs, as usual, are generally kept. The breed of horses is superior; many are brought from Connacht and reared for sale in Dublin. Wood is not plentiful; there are some small copes and underwoods, the remains of ancient forests; and some thriving young plantations. The following table shows the sales of grain in the years 1826 and 1835:

<table>
<thead>
<tr>
<th>Market</th>
<th>Barrels of Wheat 1826</th>
<th>Barrels of Oats 1826</th>
<th>Barrels of Barley 1826</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20,000; 2,000; 2,000</td>
<td>14,000; 1,400; 1,400</td>
<td>19,000; 1,900; 1,900</td>
</tr>
<tr>
<td>Mullaghar</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Castletown Delville</td>
<td>200</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ballinamore</td>
<td>None</td>
<td>20,000; 2,000; 2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Cloonlough</td>
<td>300</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Rathnew</td>
<td>400</td>
<td>50</td>
<td>4,000</td>
</tr>
<tr>
<td>Moate</td>
<td>Average from 1826 to 1835</td>
<td>4,000</td>
<td>150</td>
</tr>
<tr>
<td>Average from 1835 to 1836</td>
<td>4,900</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No return was received from the markets of Castle Pollard and Kilbeggan, so the prices of those sold at Moate either in the years 1826 and 1835 or in the interval between them. Collinston is not noticed. The name Coolnahoe in the tables is, we suspect, an error. We know not with what place to identify it. The manufactures of the county are not important; they consist chiefly of the necessary articles. The returns of 1831 give 285 adult males as engaged in manufacture, 92 in that of linen (chiefly coarse), 22 in that of cotton, 20 in that of friezes and other woollens, chiefly coarse, and 2 in the silk manufacture. The returns were not specified. To these must be added 820 weavers, returned among the retail tradesmen and handicraftsmen; but what fabric they produced is not stated.

Communications.—The Shannon is navigable for steamboats conveying goods and passengers, or acting as steam tugs to other vessels, throughout that part which borders on this county. The Royal Canal, which connects Dublin and the east coast with the upper part of the Shannon at Tarmoybar, crosses this county from east to north-west, passing near Killinan and Mullagar. A branch from the Grand Canal between Philiptown and Tullamore in King's County, to Kilbeggan, is partly in this county.

The principal roads are those from Dublin to Longford and Athlone respectively. The Longford branch enters this county from that of Meath near Kinnegad, and runs north-west by Mullagar and Rathowen into the county of Longford. A branch from this at Mullagar takes a rather more westerly direction from Ballinamore to Sallins. The Athlone road branches from that to Longford just after it enters the county at Kinnegad; and runs westward by Rochford Bridge, Tyrrell's Pass, Kilbeggan and Moate, to Athlone. The road from Dublin to Granard runs through the northern part of the county by Castle Pollard. The principal traffic is carried on by the canals and by the Athlone road; but the number of passengers is rather the greatest by the Longford and Athlone roads. Many however travel by the Royal Canal to Mullagar, and by the branch of the Grand Canal to Kilbeggan.

Divisions, Towns, &c.—West Meath is divided into 12 baronies, whose relative situation and amount of population are as follows:

<table>
<thead>
<tr>
<th>Population in 1831</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brumney</td>
</tr>
<tr>
<td>Clonmacnoise</td>
</tr>
<tr>
<td>Corkree</td>
</tr>
<tr>
<td>Delvin</td>
</tr>
<tr>
<td>Denore, or Half Fowre</td>
</tr>
<tr>
<td>Farhill</td>
</tr>
<tr>
<td>S.E.</td>
</tr>
<tr>
<td>Kilkenney West</td>
</tr>
<tr>
<td>Moyasheil and Magheradourn, or Magheradourn, Central</td>
</tr>
<tr>
<td>Moyasheil</td>
</tr>
<tr>
<td>Moyoisheil</td>
</tr>
<tr>
<td>Rathconnagh</td>
</tr>
<tr>
<td>G. 136,878</td>
</tr>
</tbody>
</table>
### Population

<table>
<thead>
<tr>
<th>Date</th>
<th>How ascertained</th>
<th>Inhabited Houses</th>
<th>Families</th>
<th>Families chiefly engaged in Agriculture</th>
<th>Families employed in the forests and handcrafts</th>
<th>Families not included in the preceding classes</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1792</td>
<td>Estimated by Dr. Beaufort</td>
<td>13,693</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>69,000</td>
</tr>
<tr>
<td>1813</td>
<td>Under Act of 1812</td>
<td>no return</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>126,942</td>
</tr>
<tr>
<td>1821</td>
<td>Under Act 55 Geo. III. c. 120</td>
<td>23,478</td>
<td>23,478</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>136,572</td>
</tr>
<tr>
<td>1831</td>
<td>Under Act 1 Will. IV. c. 19</td>
<td>23,683</td>
<td>23,683</td>
<td>16,924</td>
<td>2,694</td>
<td>4,813</td>
<td>67,700</td>
<td>69,172</td>
<td>136,572</td>
</tr>
</tbody>
</table>

The county town is Mullingar; the parliamentary borough and market-town of Athlone is partly in this county, partly in that of Roscommon; and there are the market and post towns of Kilbeggan, Moate, Rathowen, Castletown-Delvin, Ballinacarry, Clonmelon, and Castle Pollard (of these Kilbeggan is a corporate town); the market-town of Collinstown; and the post towns of Kinneag, Ballymore, Tyrrell’s Pass, Killucan, Rochfort Bridge, and Drumcree. Athlone is described elsewhere. [ATLONE.]

Mullingar is in the barony of Moycashel and Magheraderman, but the parish extends into the town of Mullingar, which is nearly 50 miles from Dublin by Maynooth, Clonard, and Kinneag. It was one of the towns founded by the English settlers of Meath. In the war of the Revolution the town was fortified by General Ginkel, and became the rendezvous of William’s army, which prepared an assault on Athlone. The town is surrounded on three sides by the Royal Canal, and consists of a principal street, about half a mile long, and some smaller ones. The number of houses in 1831 was 1,476, or 1,528 in the whole parish. Those in the town are chiefly of stone. The church is a tolerably spacious building, erected in the present century, with a handsome tower and spire. There are a handsome Catholic chapel and one or two Dissenting meeting-houses. The county court-house is convenient; there are a court gaol, erected within the last few years, and an older prison, now used only for females; a county infirmary, an hospital, barrack for a thousand men, and a nest and commodious market-house in the centre of the town. The population of the town in 1831 was 8,545. The assizes for the county, the quarter-sessions for the diocese, and petty-sessions for the district, are held, and a portion of the county constabulary have their station here. The Royal Canal gives the town the benefit of water-carryage; and considered a business is done at the market (which is held on Thursday) in corn, butter, and freize coating. There are four yearly fairs for cattle; one of them is a considerable horse-fair. The town is not incorporated; but a charter of King Charles II. granted the lord of the manor several privileges, and to the freedomers the privilege of sending two members to parliament; this last was abolished at the Union. The living is a vicarage in the diocese of Meath, and in the patronage of the crown. The living is held by a Catholic priest. Kilbeggan is in the barony of Moycashel, 56 miles from Dublin, on the road to Athlone. It was the scene of a conflict in the rebellion of 1798 between a party of insurgents and the regiment of Northumberland Militia. The town contains 550 houses; the whole parish 722; half of those in the town are well built, and have slate roofs. The church was originally part of an ancient monastic institution, dissolved at the Reformation. There is a handsome Catholic chapel and a Methodist meeting-house. The market-house is a neat building. The population in 1831 was 1,955 for the town, or 4,039 for the whole parish. The trade of the town is considerable: distilling, brewing, milling, and sawn-making are carried on; much butter is sold at the market, which is held on Saturday, and there are four yearly fairs. A branch from the Grand Canal recently made bids fair to increase the prosperity of the town. Kilbeggan was incorporated by James I.; the corporation consists of a portreeve, twelve burgesses, and an unlimited number of freemen. The portreeve has jurisdiction in the borough conjointly with the county magistrates. There is a county court for the recovery of debts, petty sessions for the district are held here. The town formerly sent two members to the Irish parliament, but was disfranchised by the Union. The Catholic parish is a perpetual one; the parish is, in the Catholic arrangements, united with an adjoining one.

Moate-a-Grenouge is in the barony of Clonlronan, 45 miles from Dublin, on the road to Athlone. In the war of the English Revolution a party of the Jacobites were defeated here by William’s army under General De Ginkel, and compelled to flee to Athlone. The town consists almost entirely of one street, and contains 224 houses, the greatest part slated, the rest thatched. The population of the town in 1831 was 765. The trade of the place appears to be diminishing; the manufacture of cottons and linens has much declined, and several breweries and distilleries have been discontinued. There is a market on Thursday, one of the most important for oats in the county; and there are several yearly fairs. The quarter-sessions for one division of the county are held here, and also petty sessions for the district. There is a convenient communication with Dublin by rail. There are several minor roads from the town. A party of the county constabulary have their station here. The town is in the two parishes of Kilticleigh and Kilmanaghan, chiefly in the former, the parish church of which is in the town. There is a Catholic chapel and several small cottages of worship.

Rathowen is in the barony of Moygois, 64 miles from Dublin, on the Longford road, and 13 or 14 miles from Mullingar. The town contained, in 1831, a parish church, a Catholic chapel of the union in which the parish is concluded, a market-house, and 107 houses, almost all thatched. The population was 605 for the town, or 2,170 for the whole parish of Rathaspects, in which it is situated. There is a market on Tuesday, chiefly for oats, and two fairs in the town.

Castletown-Delvin is in the barony of Delvin, 50 miles from Dublin. An old castle, built here by De Lacy, lord of Meath, was for a time the residence of the Nuggents, who built also the castle of Clonlronan in the parish. The castle built by De Lacy the ruins remain; the walls form a quadrangle with towers at the corners. There are several other castellated ruins in the neighbourhood. Clonmelon is in the barony of Clonmelon, 65 miles from Castletown-Delvin. There is the approach of Cromwell. The name of Clonmelon is retained by the present residence of the marquis of Westminster. The town consisted in 1831 of a single street of 77 houses, with a population of 419. There is a parish church, a plain old building, but in good repair, and a Catholic chapel. The market lately established is on Friday, and there are three fairs in the year. Petty-sessions are held here, and are held in the parish of Kilbeshy, and the Roman Catholic chapel for the parish is in the town. There is a market on Wednesday, the largest in the county for oats and barley, and a market on Saturday for provisions; also two yearly fairs. Petty-sessions are held here, and the town is one of the stations of the county constabulary. There are a dispensary and a free school.

Clonmelon is in the barony of Delvin, close upon the border of the county. It is a neat little town, comprehended in 1831, 179 houses, and a population of 967. The town is in the parish of Killos, in which parish the town is situated, is near the town; it is a neat building, with a spire.

Castle Pollard is in the barony of Delvinmore, 44 miles.
Rochfort Bridge, or, as it is sometimes called, Beggar’s Bridge, is in Fartullagh barony, and about 47 miles from Dublin, on the road to Athlone. It contained, in 1831, only 27 houses and 171 inhabitants. The parish church of Caslone, in which the place stands, and a national school, are in the town. The county constabulary have a station here.

Drumcree is in Delvin hundred. It contains the parish church of Kilcumney (in which parish the town is), a school schoolhouse, and a dispensary. It had, in 1831, 37 houses and 197 inhabitants.

The village of Fore or Fowre, or, more accurately, of St. Feighan of Fowre, is in the barony of Demifore, not far from Lough Lene. Though now only a small village, it was formerly a bishopric. It is thought that the town was founded here in the seventh century, and is said to have contained, a few years after its foundation, 3000 monks. This monastery, after having been repeatedly destroyed by fire, was re-founded in the beginning of the tenth century by Walter de Lacy, for Benedictine monks. There are still some remains of the abbey, and there is an ancient and massive building, supposed to have been a hermitage. In the fifteenth century considerable remains were taken for the building of the town, which had acquired the privileges of a corporate borough. The town consists of several square houses, two of the gates, and traces of the town wall, the extent of which shows its former size. Fowre was a borough by prescription, and returned two members to Parliament until it was disfranchised by the Union. The village had, in 1831, 19 houses and 119 inhabitants.

Ecclesiastical and Legal Divisions.—The county is almost entirely in the diocese of Meath; a small portion on the north-western side of the county is in the diocese of Armagh. The county is still held by the archbishop of Tuam, but is now to be permanently united to the diocese of Kilmore. Both Kilmore and Meath are in the ecclesiastical province of Armagh.

West Meath is included in the home circuit: the assizes are held at Mullingar, where are the county court-house and gaol. Quarter-sessions for the county are held at Mullingar and Moate-a-Grenogue, where are a court-house and a bridewell.

West Meath returned ten members to the Irish parliament, two for the county, and two each for Mullingar, Athlone, Kilbeggan, and Fowre. At present it returns three to the Imperial parliament, viz. two for the county, and one for the borough of Athlone.

The police force of the county, on the 1st of January, 1836, consisted of 1 magistrate, 7 chief constables, including sub-inspectors (viz. 4 of the first and 3 of the second class), 78 other constables, and 222 constables’ wives, with 9 horses. The expense of maintaining the constabulary for 1835 amounted to 10,051l. 4s. 9d., of which 5400l. 15s. was chargeable against the county.

The county gaol at Mullingar has lately experienced a very extensive change for the better. (Annuaire 1839.) 342 beds have been made of the system of instruction in trades. But the discipline of the female side still requires very much attention: the accommodation is very insufficient, and there is no classification. There are two schools in the prison, and a treadmill for those sentenced to hard labour. The Moate bridewell is on a tolerably large scale, with every accommodation requisite for classifying the prisoners, and is clean and well kept. (Appendix to Fourteenth and Fifteenth Reports of Inspectors.)

The number of convicts for criminal offences in 1836 was, for offences against the person, 282 (of whom 184 were convicted, 98 acquitted or discharged); for offences against property committed with violence, 43 (20 convicted, 23 acquitted or discharged); for other offences against property committed without violence, 164 (112 convicted, 52 acquitted or discharged); for malicious offences against property, arson, &c., 22 (8 convicted, 14 acquitted or discharged); for forgeries and offences against the currency, 7 (2 convicted, 5 acquitted or discharged); for other forgeries (1 convicted, 12 acquitted or discharged): making a total of 761 persons convicted, of whom 552 were convicted and 209 acquitted or discharged. Only one person was executed. Of the persons convicted, 263 were males (5 of them under the age of 15 years), and 126 females (2 under sixteen); 342 could read and write, 118 could read only, and 296 were
entirely ignorant. Of the degree of instruction they had received could not be ascertained.

The Lunatic Asylum for the counties of West Meath, King's, Queen's, and Longford, is at Maryborough, in Queen's County: of 131 patients in this institution on the 1st of January, 1837, 28 belonged to this county. The country is industrious, and a Mining District of Mullingar. There were, in the year 1833, a fever hospital at Castle Pollard, and fourteen dispensary in different parts of the county, supported in equal proportions by grand jury presentations and private contributions.

Historical and Antiquities.—This county was included in the kingdom of Meath, of which it formed the western division. In common with the rest of that kingdom it suffered severely both from the ravages of the Danes and from the incursions of the Irish. There was a great population of Meath, granted by Henry II. of England to Hugh de Lacy, one of the Anglo-Norman barons who assisted in the reduction of the county. [MEATH.] It was the scene of frequent hostilities for several centuries between the native Irish, who were not entirely expelled or subdued, and the English, and was, for above a century before its formation into a separate county, in a state of anarchy, in which the English laws ceased to be observed. West Meath was separated from Meath or East Meath in the 3rd of Henry VII; at the last separation it included Longford, which was not detached from and formed into a separate county until the reign of Elizabeth. King's County, which was partly taken from West Meath, had been formed a.d. 1550, in the reign of Philip and Mary.

The great insurrection of 1641 is said to have been planned and agreed upon at the abbey of Mullinsarn in this county, which being much resorted to for religious purposes, and therefore less liable to suspicion, was chosen by the rebels for their principal place of meeting.

In 1648 Athlone, in which the partisans of Renouenac, the papal nuncio and head of the extreme Catholic party, had endeavoured to maintain themselves, was taken by the confederate royalists under Lord Clannickarde and General Preston.

In the war of the English revolution West Meath was the scene of some important operations. [ATHLONE.] An extensive change of the landed property of the county resulted from the confiscations which followed the war. The other families have disappeared almost entirely from the grand-jury list.

In the Rebellion of 1798 the county was but little disturbed, though many of the peasantry had furnished themselves with arms; in September of that year the invasion of Ireland by the French detachment under General Humbert, the insurgents assembled and joined those of the neighbouring counties in an attempt to seize Granard, in which they were repulsed. They were put down by a squad of horse and dragoons, under the command of Lord Charlemagne.

There are many vestiges of antiquity scattered through the county. There are numerous ruins of ancient castles, including some erected by the De Lacy's. Somnach Castle, one of these, is in the parish of Townshend. Of monastic buildings there are several ruins; and some churches, formerly conventual, are still used for divine worship by Catholics or Protestants.

WAKEFIELD'S IRELAND; PARLIAMENTARY PAPERS; HARRIS'S HIBERNICA; MORRIS'S HISTORY OF IRELAND.)

MEATH, DIOCESE OF. Several small bishoprics (of which the principal were Duleek, Clonard, Kells, Trim, Ardbraken, Dunhaughtin, Slane, and Fowore) gradually coalesced into one see, which, at the end of the twelfth century, the bishops of Meath, Dublin, and Armagh, united, in the name of the bishopric of Clonmacnois, which became a diocese, A.D. 1589, by the addition of the bishopric of Clonmacnois. The diocese comprehends nearly the whole of the counties of Meath; West Meath; a considerable part of King's County; small parts of Longford, and Kilkenny. It is on the right bank of the county of the town of Drogheda. It extends in length from east to west from the sea to the Shannon, 80 English miles; and has a medium breadth from north to south of 22 English miles. There is no ca to the church where there is a dean and chapter. The dean and chapter is one of the deanies of the Meath and the archdeaconry of Meath. The want of a chapter is supplied by a synod, of which every incumbent is a member, and the archdeacon president. The diocese is included in the province of Armagh, and is bounded on the north by the county of Down and Armagh.

The bishop has precedence of all the other Irish bishops. His residence is at Armagh near Navan.

The number of parishes is given by Dr. Beaufort (1792) at two hundred and twenty-four, and part of another; the number of benefices at ninety-nine; and of churches at seventy-seven. In 1834 the number of parishes was two hundred and twenty; of benefices, one hundred and five, of which forty-seven were unions of two or more parishes; of churches, one hundred; of other episcopal places of worship six; of Presbyterian meeting-houses, three; of other dissenters, nine; and places of worship of the Roman Catholic chapel, one hundred and fifty-six; giving a total of two hundred and eighty-three places of worship of all denominations. The population of the diocese in 1834 was 205,959, and in 1861, 377,562. There were 9,520 members of the Establishment, 672 Presbyterians, and 199 other Protestant dissenters.

There were at the same time 758 daily schools, in which were 28,695 children under instruction, being in the proportion of 216 per cent. to the Roman empire, Ixxinum, in the number of children under instruction as compared with the population, Meath ranks twelfth among the thirty-two dioceses of Ireland. Of the above-mentioned schools, 45 were in connection with the National Board, and 158 with the sub-committees of the Commissioners of Public Instruction in Ireland.

The lands belonging to the see comprise 29,269 statute acres, of which 20,266 are of profitable land. The average yearly revenue of the bishopric, for the three years preceding 1839-41, is £1031 19s. 6d.

There is a Roman Catholic bishopric of Meath. The bishop is a suffragan of the Roman Catholic archbishop of Armagh. There were in this diocese, in 1834, 66 parish priests, including the bishop, who officiates at Mullingar, where is the cathedral, a handsome edifice of modern erection; and 60 deacons or curates.

MEAUX, a town in France, capital of an arrondissement in the department of Seine et Marne. It is on the bank of the Marne, and has its streets in a direct line east by north of Paris, or 27 miles by the road.

The original name was Latinnizum and it was the capital of the Melli, a Celtic people who were included in the Roman province of Lugdunum Quarta or Senonum. Trajan, in 113 A.D., mentions the name of Melli, and supposed name of Melli, whence the modern Meaux. In the early history of the Franks it was a place of considerable consequence. It was included in the possessions of the counts of Champagn, and was united to the domains of the counts of the county in year, during the reign of Philippus the Arab, 1144, with the counts of Champagn. It was one of the places in which the reformed faith early met with a favourable reception; but it afterwards came into the hands of the League, from which it revolted to join Henri IV. It was the seat of the Abbaye de Saint-Chinianum.

The town is divided by the Marne into two unequal parts, and the canal of the Oureq passes by the foot of its ancient walls, which have been planted with trees and converted into a promenade. The streets are not well laid out, but the houses are tolerably good. The principal building of the cathedral, commenced in the eleventh century. The architecture is Gothic; the magnificent choir contains a marble statue of Bossuet, who was bishop of this see. There are two parish churches and a Protestant church. The Palais de Justice, or court-house, was built by the ancient counts of Champagn. There are good barracks for cavalry. The population in 1831 was 8481 for the town, or 8537 for the whole commune; in 1836, 7899 for the commune. The inhabitants are principally agriculturists, and supply the market with potatoes, flour, cheese, bread, eggs, lard, fat, flax, and wool. There are in the place 5 paper-mills, and 4 oil-mills. There is a considerable trade in corn, especially oats, sent to Paris, flour, cheese (called from the district Brie cheese, and accounted very excellent), wool, calf, poultry, wood, soap, and tallow. The trade is carried on by water on the Marne, and on the canal of the Oureq, which is navigable to Paris, and reaches the town. The town is on the road to Paris, and 39 miles from the capital. The bridge across the Marne is of stone, and has 9 arches. The town is on the road to Paris, and 39 miles from the capital. The bridge across the Marne is of stone, and has 9 arches. The town is on the road to Paris, and 39 miles from the capital. The bridge across the Marne is of stone, and has 9 arches. The town is on the road to Paris, and 39 miles from the capital. The bridge across the Marne is of stone, and has 9 arches.
Meaux is the seat of a bishopric, established in the fourth century, and now having for its diocese the department of Seine et Marne. The bishop is a suffragan of the archbishop of Paris.

The department of Meaux has an area of 463 square miles; the population in 1831 was 93,417; in 1836 it was 90,965. It is subdivided into seven cantons or districts, each under a justice of the peace, and comprehends 160 communes. Millstones and marble are quarried in it; and there is an unanswerable stratum of gypsum in the neighbourhood of Meaux.

MECHA. [ARABIA.]

MECHAIN, PIERRE-FRANCOIS-ANDRE', was born 16th August, 1744, at Laon, a town of France, in the province of Picardy, where his grandfather was a lawyer. He received a very good education, was graduated as an astronomer, and was appointed to the post of hydrographer, in which he was engaged in the construction of marine charts, and, jointly with M. Bretonnet, was the author of mixed maps of the Seine, the Channel, and St. Malo. His attention however appears to have been chiefly directed to the theory of eclipses, and of comets, of which he discovered eleven, and computed the orbits of twenty-four. To his memoir on the comet of 1739, which it was supposed would re-appear in 1769 or 1780, the prize of the Academy of Sciences was awarded, and the same year (1782) he was admitted a member of that society. In 1791 the National Convention having determined upon employing the length of the arc of the meridian comprised between Dunkirk and Barcelona, was, at the recommendation of the Academv, confided to Mechain. The northern portion was actually measured, and as a result of this enterprise, Mechain was awarded the prize of the Académie des Sciences (Société Métrique, Paris, 1806-7-10, 3 vols. 4to.), containing many interesting particulars relative to Mechain, we refer the reader. It will be sufficient here to state that Mechain experienced his share of the difficulties and annoyances incident to the completion of such an enterprise, and that the breaking out of the French revolution, which prevented his return from Spain, and the consequent anxiety for his family whom he had left behind, brought upon him a melancholy state of mind from which he never wholly recovered. He published three volumes of memoirs on the subject, by Delambre, and also the accuracy of all his calculations connected with the survey. Of Mechain himself we have no other conception than that it is productive of motion or of a tendency to motion; or that it arrests an actual motion or renders a tendency to motion ineffectual. When opposing forces act on a body, the tendency of one of the forces to destroy or slow down the motion is the employment of the lever and inclined plane; and from these, subsequently, the wheel and axle, the pulley, the wedge, and the screw were derived. The simple means here indicated would be sufficient, with the aid of manual labour, to build up the most massive cyclopean edifice; and even the floating materials which form the roofs of the Egyptian temples may have been raised to their places by means of inclined planes, formed of earth for the purpose, on the exterior of the walls, and afterwards removed.

The steps by which the art of constructing machines advanced have not been distinctly recorded; and the work of Vitruvius on architecture is almost the only source from which we can obtain an account of such as were in use in ancient times. In addition to this, he describes the various machines employed for the purpose of measuring the distances travelled or sailed; and he enters fully into the construction of engines for throwing darts or masses of stone. The muscular strength of men was then employed as a moving power in turning mills; wheels impelled by river currents acting on floating boards (pennae) gave motion to machinery for grinding corn; and wheels turned by men walking on them were...
used for raising water by buckets or otherwise. Vitruvius generally mentions the names given by the Greeks to the machinery; and it might, without great risk of error, be presumed that much of that which he describes was in use among the latter people at, or even before, the time when the Parthenon was raised. There are no distinct indications of windlasses till the sixteenth century. The expansive force of steam can only be said to have become a moving power at the end of the seventeenth century, and then it was employed merely to raise water. Its general application to machinery must be dated from the year 1768.

In tracing the progress of discovery concerning the mathematical theory of mechanical action, we shall have little to notice till we come to the sixteenth century; for the ancients, leaving themselves much in the dark as to the researches of pure science, almost entirely neglected the application of the latter to subjects which appeared to them to terminate in mere practical utility. It must be observed, however, that Aristotle, who left no department of nature untouched, has noticed, in his mechanical questions, the equilibrium of unequal weights on the unequal arms of a balanced lever, though he gives a very unphilosophical reason for the fact. But in his 'Physics' he states correctly the propositions of the force of bodies moving velocity in proportion to their intensities, they will exert equal efforts; this may apply to a well-known property of the lever, but it may have been meant to refer only to the effect of two unequal bodies moving with unequal velocities, and striking each other.

Sicily enjoys the honour of having given birth to the first philosopher who can probably be said to have been a theoretical mechanician; we allude to Archimedes, who died about 212 B.C. and, in whose works there is direct evidence of an extensive use of machinery in the treatises whose Latin title is 'de Equiponderantibus,' with the axiom that two equal weights balance each other on a lever (of uniform density) at the equal distance of the centres of their supposes the weights to be divided into an equal number of equal parts, and that the parts are removed to equal distances from the point of support; observing then that the equilibrium still subsists, he proceeds, by the method of exhaustions, to show that it always will take place provided the bodies are inversely proportional to their distances from the fulcrum. Archimedes thence concludes that there must exist in every body, considered as an assemblage of smaller bodies, a centre of force (that is, a centre of gravity), from which the fulcrum is removed, when he proceeds, by the analysis of that day, to investigate the seat of the centre of force in a triangle, a parabola, and a paraboloid.

This philosopher has obtained eternal celebrity by the contrivances which he is said to have adopted for the defence of Syracuse. No precise account is given of the machinery which he employed to raise up and destroy the galleys of the enemy, and the effects are probably exaggerated. The vessels must have been close to the walls, and it is conceivable that, by hooks at the ends of chains which were suspended from levers on the ramparts, the rigging, or some parts of the turrets erected as usual on the deck, in order to enable the assailants to pass over the parapets, might be caught; then, the levers being raised by the force of men or otherwise, the vessels or the turrets would be easily overturned.

During about 1600 years, which elapsed between the time of the death of that of Carthage, we have no other notices concerning the theory of mechanics than those (which occur in the writings of the former mathematician,) than such as are contained in the 'Mathematical Collections' of Pappus, which amount merely to a statement that the properties all referred to the theory of that of the lever, and an unsuccessful attempt to explain the cause of the equilibrium of a body on an inclined plane. It is remarkable moreover that both Carthage and, subsequently, the marquis Ushiki (the latter of whom published, in the eighteenth century, his book on the equation of the motion of pulleys, and reduces their theory to that of the lever) should also have given erroneous solutions of the problem concerning that equilibrium. The discovery of the true principle of the inclined plane, however, about the same time, made by Stevinus, a native of Flanders. This mathematician and engineer supposed a chain of uniform
Numerous other problems of the like nature were given out among the parties, and the solutions could not fail, if no other benefit arose, of carrying the new calculus to a considerable degree of perfection.

The event of the civil war disturbed science, was, till lately, but little cultivated in this country; but on the continent a succession of illustrious men continued to prosecute the investigation of subjects connected with it, and by the employment of analytical processes they rendered com parative precision to the demonstration of its principles to the researches of physical astronomy.

The mathematicians who may be considered as the immediate successors of Newton were chiefly Euler, D'Alembert, and Clairaut; and in the works of the first of these it is to be observed that the phenomena of rectilinear and curvilinear motion when a body is in a vacuum or in a resisting medium is subject to any forces whatever. But the most remarkable event in the history of the sciences, after the discoveries of the English philosopher, was the vast amount of the celebrated problem of the three bodies; or that whose object is to determine the motions of a body when attracted by and revolving about another, and continually disturbed by the attraction of a third. This was at the close of the seventeenth century (about 1750), and independently of each other, accomplished by the great French philosophers, named, and it now constitutes the basis of the whole planetary theory. The ‘Mécanique Analytique’ of Laplace, which was published in 1786, and the ‘Mécanique Céleste’ of Laplace, the last ascensions which the mathematical sciences have since acquired, show that the sciences now comprehend the laws of force or motion, from the properties of the simple lever to the phenomena of the heavenly bodies.

It may have been above stated that the first general principle in mechanics is that of the equilibrium of bodies on a lever; and a knowledge of it may be ascribed to Archimedes. The extension of the principle to all the mechanical powers was long an unsolved problem, and the solution of which was first made by the discovery of Galileo. Daniel Bernoulli (about 1725) the first demonstrated the rule of the composition of forces independently of motion; but the application of the principle as a means of obtaining general equations of equilibrium seems to have been first made in 1667. Project Nouvelle Mécanique, which was published by Varignon in 1667.

La Grange treats as a third principle in mechanics that of virtual velocities. By this is meant those which bodies in equilibrium would have at the first instant of their motion. The distribution of the forces forming the first principles of this principle are found in the writings of Galileo, Wallis, and Descartes, but John Bernoulli is thought to have been the first who showed its utility in resolving statical problems. [Virtual Velocities.] A general method of solving moving problems, was first made use of by D'Alembert, and it may be thus enunciated. If there be impressed on bodies motions which they are forced to change in consequence of their mutual actions, those motions may be considered as compounded of the motions which the bodies do really take, and of those which are destroyed. Whence it results that these last must be such that if they alone existed the bodies would be in equilibrium. In order to avoid the decompositions of motions which this principle requires, an equation is frequently made between the general and the immediate forces and the expression for those forces which produce the observed motions. [Forces, Impressed.] The manner of estimating the value of a mechanical force is various; and a difference in the determination of the same force continued during nearly all the first half of the eighteenth century. [Force.]

Besides the principles above mentioned there occur in mechanical investigations several others, which it will be proper to state briefly in this place.

That which is called the preservation of living forces is a consequence of the discovery of Huyghens concerning the movement of the centre of gravity in a compound body. For the space described by that centre is expressed by the quotient arising from the sum of the products of the mass of each body into the distance it passes over, divided by the
sum of the masses; and since the masses descended by bodies when acted on by gravity are proportional to the squares of the velocities, it follows that the sum of the products of the mass of each body into the square of its velocity is constant, whether the bodies move jointly in any manner, or whether they descend freely through equal vertical spaces.

The preservation of the centre of gravity is a principle which contains the discovery of Newton, that the motion of the common centre of gravity of several bodies is not affected by the mutual attractions of the bodies. It was subsequently extended by D'Alembert, who shows that if the bodies are solicited by a constant and collinear force in directions either parallel to each other or tending to a fixed point, the centre of gravity must describe the same line as if the bodies were free.

The preservation of areas seems to have been discovered at the same time by Newton, Daniel Bernoulli, and the Chevalier D'Archi, about 1750. According to the latter it is an extension of Newton's theorem that the radii vectors of revolving bodies describe equal areas in equal times, and it consists in this: that the sum of the products of the masses into the velocities and into the perpendiculars let fall from the fixed point on the line of motions of the centres of gravity of these bodies, vectors about a fixed point is proportional to the time. Or the sum of the products of the masses into the velocities and into the perpendiculars let fall from the fixed point on the line of motions of the centres of gravity of these bodies, vectors about a fixed point is proportional to the time.

The principle of least action originally signified, that when bodies act on each other, the sum of the products of the masses into the velocities and spaces described is a minimum. But considered in the most general sense, without limitations given as to the magnitude, the principle consists in this: that in trajectories described by bodies subject to central forces, the integral of the velocity multiplied by the element of the orbit is always a maximum or a minimum.

A general outline of that part of mechanics which relates to the equilibrium of solid bodies is given under the wordStatics; and the details of the subjects may be seen under Lever, Wheel, &c. The part of mechanics which relates to bodies in motion appears under the words referred to the word Kinetics.

MECHELEN, called Malines by the French, is a large well-built town in the province of Antwerp, in 51° 27' N. lat. and 4° 29' E. long. It stands in a fertile plain on the river Dyle, by which it is intersected. The streets are wide, well-paved, and kept remarkably clean. The large square called La Place d'Armés, and the market-place, are in particular deserving of mention. The cathedral, dedicated to St. Rombaud, the patron saint of Mechelen, is the most remarkable building in the town. Its tower is 349 feet high, and its spire is 200 feet high. The bells are 12 in number. The other principal buildings are the arsenal, which contains a cannon-foundry; the town-house, the archiepiscopal palace, and the church of the Jesuits. Mechelen contains a college, an academy of painting, a society of fine arts, and a large arsenal which serves as a storehouse for 600 widows and aged women.

It appears that as early as the fifth century Mechelen was the capital of a lordship, which was afterwards given in 754 by Pepin to one of his relations. It was subsequently deserted by the Normans, and rebuilt in the year 580. In 910 it was ceded by France to the bishop of Liège. At this time it occupied only the left bank of the Dyle, but was extended on the other side of the river in 970. Mechelen was sacked by the Spaniards in 1572, and by the army of the Prince of Orange in 1578. It was taken in 1720 by the Duke of Marlborough; and by the French in 1746, but was restored at the peace of Aix-la-Chapelle. In 1792 it was again taken by the French, who in 1804 restored its former occupation.

This town is the seat of an archbishop, created in 1559 by pope Paul IV. The archbishop is the head of the Catholic church in Belgium, and has for his suffragans the bishops of Namur, Tournay, Aix-la-Chapelle, Trèves, Ghent, Bruges, Liège, and Malines.

Mechelen carries on an important trade by means of vessels of considerable burthen, which ascend the Schelde and the Dyle at high-water, the influence of the tide being felt a few miles above this town. The principal articles of commerce are corn, oil, hemp, flax, and hops. The lace manufacture at Mechelen has long been in high repute, and bears a great price. There are manufactories of hats, shoes, coarse woollens, and paper, cotton-mills, dye-houses, breweries, distilleries, and tanneries. It has recently acquired additional importance from the circumstance of its being the central point at which the several railroads of Belgium meet. It is about midway between Brussels and Antwerp, and distant from both about thirteen miles. The population of Mechelen in 1836 was 22,962. (Van der Mechtin's Dictionnaire Geographique de la Province d'Anvers.)

MECHLIN. [MECHLEN.]

MECHLOIC ACID. This acid was formed in 1535 by Couperie, by passing chlorine gas over fused meconin. When purified by the action of acetic acid, the pure substance is of a white crystalline, having a critical point at 273°; at 276° it is volatilized; and by a strong heat it is decomposed. It is stated by its discoverer to be composed of

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100%

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MECKENBURG, which consists of the two grand-duchies of Mecklenburg-Schwerin and Mecklenburg-Strelitz, is situated in Northern Germany, between 53° 6' and 54° 21' N. lat., and 10° 40' and 13° 45' E. long., and is bounded on the north by the Baltic, on the east by the Prussian provinces of Pomerania and Brandenburg, on the south by Brandenburg and the Harz mountains, and on the west by Lauenburg and the territory of Lübeck. The area (according to Hempel) is 5890 square miles, namely, Mecklenburg-Schwerin 4788, and Mecklenburg-Strelitz 1072. The greatest extent of Mecklenburg, from north to south, is 118 miles, and from east to west, 127 miles.

Divisions.—Mecklenburg-Schwerin is divided into circles or districts. I. Mecklenburg (251,476 inhabitants): chief towns, Schwerin, the capital (131,035 inhabitants); Parczin (5630 inhabitants); Ludwigsburg, the residence of the grand-duke (nearly 5000 inhabitants). II. Henden (19,418 inhabitants): chief town Güstrow (8620 inhabitants), one of the handsomest towns, and the fourth in size in the grand-duchy. It was for many centuries the residence of the princes, and has several remarkable public edifices, especially the cathedral, which contains some costly monuments of the princes; the palace, which Hempel says is unquestionably the finest privately residence of the middle ages in very different degrees of quality; the last is everywhere portrayed. III. The Principality of Schwerin: chief town Wittow (3600 inhabitants). IV. The District of Rostock: chief town Rostock (29,000 inhabitants). V. The Lordship of Wismar (11,425 inhabitants): chief town Wismar (10,000 inhabitants). [SCHWERTZ; ROSTOCK; WISMAR.]

Mecklenburg-Strelitz is divided into, I. The Lordship of Circle of Stargard (69,762 inhabitants): chief towns, New Strelitz (5767 inhabitants); New Brandenburg (6000 inhabitants); Friedenhain (2600 inhabitants); Kremmen (1700 inhabitants). II. The Principality of Ratzeburg, lying quite detached from the grand-duchy, on the frontier of Lauenburg and the lake of Ratzeburg, near Lübeck (40,090 inhabitants). [STRELITZ; RATZEBURG.]

The surface of the country is low; the land of Northern Germany, may be described generally as a plain. There is a ridge or chain of hills which, commencing in the Silesian mountains, traverses the country, and extends in a north-west direction into Holstein. On both sides of this ridge there is some height, most of which great portion of the land is fertile, and in parts covered with coniferous forests. The soil is partly heavy, partly of a middling quality, and partly sand. The first, which is about one-third of the whole, is very fertile; the second is of a variable quality, and the last is everywhere covered with heath. In Mecklenburg-Schwerin there are sixty-two lakes at least 1 mile long, and
besides many smaller ones. Lake Müritz, which is the largest, is 18 miles long and 8 broad. In Mecklenburg-Strelitz the county of Stargard alone contains fifty-three lakes at least 11 miles long; the largest is the Tollen Lake, 74 miles long. Some of the rivers fall into the Baltic, and others into the Elbe. Of the former the principal are the Trave, Stepnitz, Recknitz, Peene, and Warnow; the last is 140 miles long. The river Elbe is about 100 miles. At Rostock it suddenly expands to a breadth of 2400 feet, and falls into the sea at Warnemünde. The Elbe only washes the frontier at two places, near Dömitz and Boitzenburg, which lie on its banks. The rivers that fall into the Baltic are navigable for much of their course of 100 miles, and the Havel. The coast of the Baltic, which is but little indented, is generally steep, and high above the sea; and where it is lower, the country is protected from the incursions of the sea by sand-hills. Though Mecklenburg-Strelitz is not more than 120 miles from the sea, it possesses none of the features which are so noticeable in other countries. Swine too are abundant. In some parts there is much game, such as wild boars, stags and deer, bustards, partridges, snipes, wild geese, and ducks. The geese of Mecklenburg are celebrated throughout Germany, and are a great source of revenue both in the sea and all the lakes. The country is poor in minerals, and no mines of any kind are worked.

Trade and Manufactures.—The manufactures are inconsiderable, but they improving, and great pains are taken to promote them. Probably among all the industrial establishments, that is the most important that is the manufacture of tobacco. Probably situated as the country is between the Baltic and the Elbe, its commerce is far more important than its manufactures, yet by no means so extensive and profitable as might be expected; for the laws allow the importation of all kinds of foreign goods; and the heavy duties imposed by the Prussian tariff are great checks on the trade of Mecklenburg. The Revenue of Mecklenburg-Schwerin is considerable, amounting to 2,571,000 rix-dollars per annum, of which nearly 18 millions are produced by the domains. The revenue of Mecklenburg-Schwerin is stated at 400,000 rix-dollars, but is probably higher, for the domains alone yield 300,000 rix-dollars.

Religion and Education.—The great majority of the inhabitants profess the Roman Catholic religion; almost all the clergy are of this denomination, except those of the Evangelical sect. The population is estimated at about 500,000. The number of Roman Catholics is about 350,000, and the number of Protestants is about 150,000. The schools for the people were few and ill conducted. The learned institutions were better, and the university of Rostock has had many eminent professors. Considerable improvements were made by de la Cerda, who in 1702 founded a school of agriculture. The town of Schwerin contains a University of Art and Sciences. The celebration of the centenary of the University of Rostock by the students took place in 1864. The military force of Mecklenburg-Schwerin is 3298 men, and of Mecklenburg-Strelitz 742 men. Their contingents to the army of the Confederation exceed their ordinary establishment, that of Mecklenburg-Schwerin being 3590, and a reserve of 1740 men, and that of Mecklenburg-Strelitz 718 men and a reserve of 359 men. Both form part of the second division of the 10th corps of the army of the Confederation. Their respective contributions to the treasury are 1333 florins and 666 florins.

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MEC

Form of Government.—The co-operation of estates in the affairs of the country may be traced to the remotest periods. The association in its present form, is founded on compacts entered into between the princes and the estates in 1725, 1757, 1761, and especially on that of 1775. The grand-dukes have the whole executive power; but share with the estates the legislative power and the right of imposing taxes. The state is divided into a government, consisting of the grand-dukes and his council, and a number of principalities, which are independent of each other, but the estates of the two grand-dukes are inseparably united by a compact made in 1725, called the Landes-Union. The clergy, formerly the first estate, having been excluded after the Reformation, the assemblage of the second estate is not called the first or the equestrian order, which includes all the owners of noble estates (whether they are noblemen or not). They have great privileges and immunities, and are rich and powerful. There are now 572 landowners who have seats and votes in the assembly. The second estate consists of the deputies of the forty-four towns. They meet annually at Sternberg and Malchin alternately. In general above 200 members attend. The grand-duke alone has the right of introducing such measures as he deems necessary, which is done by a council of ministers. The estates have the right to accept or reject them, and they may likewise represent what they consider as grievances, and petition for their being remedied.

The history of the country is rather intricate, in consequence of the frequent changes in the reigning family by the formation of new branches and the extinction of others, which occasioned continual partitions of the territory. Mecklenburg was inhabited by the Heruli and the Vandals. On their emigration the Goths, followed by the Wends (Wendish) tribes, of whom the most powerful were the Obotes, to whose prince Heinrich Burwini, son of Pridialus (who had embraced the Christian religion), Henry the Lion gave his daughter Matilda. Pridialus was declared in 1170 king of the empire and was the ancestor of the successive sovereigns of Mecklenburg. These princes received the ducal title from the emperor Charles IV, in 1340, and assumed that of grand-duke on joining the German Confederation in 1813.

(Hassel; Schultze, F.; Fausch; Weimann; F.; and chiefly Hempel, Geogr. Statist. Hist. Handbuch des Mecklenburger Landes, Güstrow, 1837.)

MECONIC ACID, a substance which is found only in opium, in which it exists in combination with the alkaloid morphia. It was first noticed by Seguier in 1813, and a year or two after, more particularly described by Sertuenuer, who named it mecon (μεκόν), poppy. Meconate of lime is one of the results of a peculiar process for obtaining morphia from opium. To this end, pure opium is heated to a weight of 130 lb, and hydrochloric acid is added until it is all dissolved; the solution is to be filtered, and on cooling it deposits bismeconate of lime in the state of light, scaly, or acicular crystals; these are again to be dissolved in hot and very dilute hydrochloric acid, which leaves in the mother of the lime, and on cooling, the meconic acid crystallizes. They are to be freed from colouring matter by subsequent treatment, and meconic acid has then the following properties: it acts on limus paper, and has a sour taste; it is soluble in four times its weight of water, and also in alcohol. The crystals do not alter by exposure to the air, but when heated to 212° they lose 21.5 per cent. of water, and become opaque. Although when heated even to near 250° the acid is not totally decomposed, yet the boiling solution gives out 54° of alcohol. The acid melts at 112°, and is metameconic acid. When strongly heated, it is totally vaporised and decomposed. When mixed with a solution of chloride of gold, and heated, it is decomposed, and metallic gold is precipitated; this acid possesses a very delirious-red coloured solution with the persians of iron, and this is regarded as one of the best tests of its presence, and also of that of the opium from which it is derived.

According to Liebig, meconic acid consists very nearly of Two equivalents of Hydrogen • 2 Seven equivalents of Carbon • 42 Seven equivalents of Oxygen • 56 Alphabet

The salts which contain this acid are called meconates: we shall briefly state the properties of the more important of them:—Meconate of Ammonia crystallizes in quadratile

H 2
lateral prisms, dissolves in one and a half times its weight of water, yields water when heated, and afterwards sublimes without decomposing. *Mecenate of Potash* crystallizes in tables and leaves, contains water of crystallization, and is soluble in twice its weight of cold water. *Mecenate of Sulphate* crystallizes in fine needles, which contain much water of crystallization, and are soluble in five times their weight of water. *Mecenate of Lime* forms acicular crystals, which contain water of crystallization, and are soluble in eight times their weight of water. When the acid is in contact with the salt crystallizes in prisms, and is diffusely soluble in water. *Mecenate of Magnesia* when neutral is only slightly soluble, but the supersalt dissolves readily; it crystallizes in flattened needles, which are brilliant and transparent, and have an acid and bitter taste. *Mecenate of Barites* is slightly soluble in water. *Mecenate of Iron* is a colourless and very soluble salt, which becomes red by exposure to the air, and more rapidly by the addition of nitric acid. The *Primrose Mecenate of Iron* is also a soluble salt, and is of a fine red colour, which is destroyed by more powerful acids, and protolysis of tin; the remaining metallic meconates are not important.

**Melanoconic Acid.**—It has been above mentioned that when a solution of meconic acid is heated to ebullition, that carbon acid is evolved, and a brownish solution results; this consists of colouring matter and metameconic acid. When a meconate, as of potash or lime, is boiled with hydrochloric acid, no colouring matter results, and yet metameconic acid is formed.

This acid is soluble in sixteen times its weight of boiling water, and separates on cooling in hard anhydrous grains, which, like the meconic acid, redden the persalts of iron, but they differ from it in every other respect. It is formed by the mere separation of carbonic acid, by subtracting one equivalent of which from meconic acid we obtain the acid in question:

<table>
<thead>
<tr>
<th>Acid</th>
<th>H.</th>
<th>C.</th>
<th>O.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meconic acid</td>
<td>2</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Carbonic acid</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Meconate of meconic acid may be obtained by boiling meconic acid, which yields about one-fifth of its weight. It is purified by pressure between folds of blotting paper, and crystallization from solution in water. It is fusible between 218° and 227°, and then flows like oil; it is entirely soluble at a moderate temperature, and is more soluble in alcohol even than in water. It turns the persalts of iron red, and its solution imparts a red colour to the water. It is formed by the separation of four equivalents of carbonic acid and one equivalent of water, from two equivalents of meconic acid, thus:

<table>
<thead>
<tr>
<th>Two equivalents of Meconic acid</th>
<th>H.</th>
<th>C.</th>
<th>O.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four equivalents of Carbonic acid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One equivalent of Water</td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

**Pyroconic Acid** is obtained by heating meconic acid, which yields about one-fifth of its weight. It is purified by pressure between folds of blotting paper, and crystallization from solution in water. It is fusible between 218° and 227°, and then flows like oil; it is entirely soluble at a moderate temperature, and is more soluble in alcohol even than in water. It turns the persalts of iron red, and its solution imparts a red colour to the water. It is formed by the separation of four equivalents of carbonic acid and one equivalent of water, from two equivalents of meconic acid, thus:

<table>
<thead>
<tr>
<th>Two equivalents of Meconic acid</th>
<th>H.</th>
<th>C.</th>
<th>O.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four equivalents of Carbonic acid</td>
<td>4</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>One equivalent of Water</td>
<td></td>
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**Pyroneconic Acid**

<table>
<thead>
<tr>
<th>Acid</th>
<th>H.</th>
<th>C.</th>
<th>O.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyroconic acid</td>
<td>3</td>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>

**MECONIN,** a neutral principle existing in opium, first noticed by Dalber, and more particularly examined by Courbeau. To obtain it, an infusion of opium, from which the morphine has been precipitated, is to be evaporated, and the crystallized matter, obtained after being pressed, is to be treated with boiled alcohol, and the substances contained in the solution contain narances and colouring matter, from which it is to be separated by subsequent operations.

The properties of meconin are, that it is colourless, inodorous, is at first tasteless, but afterwards acid; it is soluble in water, alcohol, and ether, and contains alcohol in any of them; the crystalline form is a six-sided prism with dihedral summits; it fuses at 194°, and is volatilized at 316°, without undergoing any change of properties. It is soluble in about 253 parts of cold water, and 20 of boiling water. It is colorless, contains alcohol, and loses it by the action of nitric acid by its action converts it into a peculiar crystalline matter. Chlorine renders it a blood-red colour, forming mechoic acid. It does not act either as an acid or an alkali.

According to Courbe it consists of—

| Four equivalents of hydrogen | 4  | 8  |
| Nineteen equivalents of carbon | 84 | 600 |
| Four equivalents of oxygen  | 32 | 355.5 |

90 100°

**MEDAL.** Numismatists have usually given the name of medals to those coins that have been struck or cast for particular purposes and on extraordinary occasions, in commemoration of victories, treaties, coronations, and similar important events; and medals are always made.

The words *medalina* and *medallione* first occur in Italian writers, from whom the English and French have evidently taken their medals and medals. The derivation of *medallione* seems to be from the Greek *medalloin* (metal); of which medals are always made.

A reference to medals, in connection with numismatics, has been made in the article on coins (Corax), to which a reference may be made. The history of medals has been independently of their relation to the general subject.

Though we have proved in the specimens that we have reached our times that the antients were not less successful in the medallie than in the other arts of design, it does not appear and arts of this class were sought after and preserved with the care bestowed on productions of the sister arts. None of the classic writers give any account of collections of medals and coins among the Greeks, and it is not until a somewhat later date that we have any distinct notice of a taste for them arising in Italy. Augustus, according to Suetonius, was the first who showed any interest in the subject; he was in the habit of presenting to his friends medals of foreign countries and princes as valuable marks of his favour.

Greek medals and medallions are very rare, few being known of earlier date than the establishment of the Imperial power at Rome, and when Greece was under Roman dominion. Some of Sicily are not however so scarce; they are very fine, and of a design that deserves the careful attention of the connoisseur. The design of the finest of these is a head, usually of Ceres, with a scythe and corn, and on the reverse a Victory crowning a figure in a car. Many of great excellence and in high bronze are contained in the British Museum. The Roman medallions differ from the Greek (we mean in this place Greek medals of the Imperial periods) in their greater substance or thickness. Those from the time of Julius Caesar to Hadrian are very fine in design and execution, and serve the careful attention of the connoisseur. Some are composed of three sorts of metal; the centre being of copper, with a border or ring composed of tin and lead, which imparts to the design a great durability, of high value. The larger bronze medallions of the antients are often of exquisite workmanship, and the devices are uncommon. Some are composed of two sorts of metal; the centre being of copper, with a border or ring composed of tin and lead, which imparts to the design a great durability, of high value. The larger bronze medallions of the antients are often of exquisite workmanship, and the devices are uncommon. Some are composed of two sorts of metal; the centre being of copper, with a border or ring composed of tin and lead, which imparts to the design a great durability, of high value. The larger bronze medallions of the antients are often of exquisite workmanship, and the devices are uncommon. Some are composed of two sorts of metal; the centre being of copper, with a border or ring composed of tin and lead, which imparts to the design a great durability, of high value. The larger bronze medallions of the antients are often of exquisite workmanship, and the devices are uncommon. Some are composed of two sorts of metal; the centre being of copper, with a border or ring composed of tin and lead, which imparts to the design a great durability, of high value. The larger bronze medallions of the antients are often of exquisite workmanship, and the devices are uncommon. Some are composed of two sorts of metal; the centre being of copper, with a border or ring composed of tin and lead, which imparts to the design a great durability, of high value.
gold medal of the council of Florence, dated 1439, is one of the earliest. A still earlier one, if the date 1415 is correct, is of John Huss; but some doubts have been entertained of its authenticity. Vittore Pisano, a painter of Verona, is celebrated as the restorer of the art at that period; but the medal alluded to of David of Scotland seems to prove it was practised before his time. Pisano's medals are very large, generally too small to be called 'Obversi Pictoris.' It is curious that he should always refer to his being a painter while exercising a totally distinct branch of art.

The Papal medals are among the finest of a continued succession of portraits since the reign of Charles V., and began in 1464; those of pontiffs who lived prior to that date having been added to the collection by successors. Some of the medals of a later period are valuable examples of the art, in which great improvements took place under Alexander VI. In fact, all the popes, from Clement VII., had many of their medals designed by Raffaello and Giulio Romano, while Benvenuto Cellini and other distinguished artists were employed to engrave them. A German family, named Ermerani, or Hermerani, of eminence as medal engravers, settled in Italy about the middle of the seventeenth century, and executed many of the Papal medals. This talent was not, it appears, confined to the men of this family; Venuti says each of the daughters also produced a fine medal.

Medals commence in 1453, and are very numerous. The Sicilian medals appear as early as 1501. The first modern satirical medal is of that time, and was published by Frederick II. against his adversary Ferdinand king of Spain. It bears on one side the head of Ferdinand, with a reference to his pretensions to the Sicilian throne; on the reverse a woman carrying off a sheep, with jupiter quievum est et omus meus levis. Many others might be mentioned of this description. The employment of medals for the conveyance of satire is not confined to the moderns. Examples of it occur among the Romans, but they are rare.

The Spanish medals begin in 1503. The earliest of Venice appear in 1509; and those of Denmark in 1516. The first medal of the Hebrews was in 1527. The medals are remarkable for the elaborate views, maps, and plans that are engraved on many of them. It has been observed among the distinctions of ancient and modern medals, that in the former, when buildings are represented, the simple elevations only are given, while in the latter perspective views are exhibited. The Dutch indulged very freely in the satirical vein, and for which they eventually paid very dearly, as it contributed, in no small degree, to bring on them the whole hostile power of France under Louis XIV., who, with his German generals, offer a magnificent exhibition of a medal in which Van Heubingen, the Dutch ambassador, was represented as Joshua (his name) arresting the progress of the sun, under which type the flatterers of Louis XIV. are ignominiously buried.

The French medals do not exhibit any remarkable excellence till this reign. The popularity of Louis XIV. gave an impulse to the art, and we find his entire life illustrated (with more respect however to the national glory and the prince's vanity than to historical truth) by medals; some of them are well designed and finely executed. The medallic history of Napoleon deserves notice in the series of medals of France. It is of great extent, and is, for the most part, honourable to French art.

Mr. Mede's whole works were collected after his death by Dr. Worthington, in one vol. fol., Lond., 1672, with a life of the Queen Anne, who are interesting from their being charged with the achievements of the great duke of Marlborough. Soon after this a Genoese artist, of the name of Dassier, was employed upon the medals of the kings of England, and executed many portraits of royal and other illustrious characters.

The study of medals is, in its class, of great importance. It is indispensable to the historian and the antiquary, and highly less valuable for more general instruction. Medals often afford information that cannot be obtained by other means, in the inscriptions, legends, and allegories with which they are charged; while to the artist and connoisseur many of them offer not only exceedingly beautiful examples of art, but their authorship can be ascertained, and on a series of medals of any nation is one of the best authorities that can be consulted for the state of the arts of design of any particular period.

It would be an almost endless task to enumerate the works that have been written on medals. The earliest treatise on the subject is that of Eneas Vico. It is dated 1548. The publications of Pinkerton in two volumes, of Eckhel, an introduction to the study of medals by Milin, of Ballarini, of Monnet, and others, enables the reader to consult the best authorities that have been written on the subject.

Medallion, a medal of an extraordinary size. Medallions were never used as current coin; whereas it is probable that medals were sometimes allowed to pass in circulation as money.

Medallion, in architecture, any circular or oval tablet bearing on it objects represented in relief, as figures, heads, animals, flowers, etc.

Mede, Joseph, was born at Berden in Essex, in the year 1586. When only ten years old he lost his father, but his education was well provided for by his relations. While a boy at school he met accidentally with a copy of Bellarmine, and soon gained a considerable acquaintance with that language. In 1602 he entered Christ's College, Cambridge, and took his degree of master of arts in 1610. At this time his learning is spoken of as extraordinary. During the earlier part of his residence at college he is said to have been troubled with sceptical opinions, which however lie soon shook off.

Mr. Mede was a treatise, 'De Sanctitate Religia,' addressed to Dr. Andrews, bishop of Ely, who procured for him the patronage of that prelate, who requested him to become his chaplain. He was afterwards chosen as member of the Brasenose College, and on the death of his fellow Mr. Broughton, was made in his stead. He was afterwards soon after made a fellow of his college and reader of the Greek lecture of Sir Walter Mildmay's foundation. He appears to have been remarkably skilful and successful as a tutor.

In 1618 he took his degree of a. D. He refused the provostship of Trinity College, Dublin, which was twice offered him, in 1627 and 1630, through the influence of archbishop Usher. The extent of his ambition seems to have been to pursue his studies without interruption in the retirement of his college. There he spent the remainder of his life, and died in 1638, in his fifty-second year.

Mr. Mede was distinguished for his meekness, modesty, and prudence, and his liberality was such that he devoted the tenth of his income to the poor. His learning was diversified and profound. In his younger years he studied astrology, but afterwards abandoned the pursuit. He was well acquainted with mathematics, medicine, and the various branches of philosophy, and was deeply versed in historical antiquities and the sciences of the East, into the abstruse parts of which he searched for illustrations of the prophecies of Scripture.

His chief work is 'Clavis Apocalypsin,' containing a system for explaining the Apocalypse, which has been followed more or less by nearly all subsequent writers on the prophecies, and is recommended by bishop Hurd in his treatise on the study of the prophecies, as being the first rational attempt to explain the Apocalypse. This work has been translated by Mr. T. Brantly Cooper, evo, Lond., 1833.
author prefixed. There is also a recent edition of his 'Apology of the Latter Times,' 12mo., Lond., 1836.

MED'EA. (Zoology.) [CILIEGRODA, vol. vii., p. 165.]

MED'IA (Medi), a country of ancient Asia. It is difficult to determine its boundaries, as they differed at various times. In the time of Strabo, it was divided into two divisions, Great Media and Media Atropatene. Great Media, which is a high table-land, is said by all ancient writers to have had a good climate and a fertile soil, as an account which is fully confirmed by modern travellers. It was separated on the west and south-west from the low country, watered by the Tigris and Euphrates, by a range of mountains known to the ancients under the name of Zagros and Parsehuros. Xenophon, however, appears to include Media all the country between the Tigris and Zagros. (Arab., ii. 4, § 27.) On the east it was bounded by a desert and the Caspian mountains (the modern Elburz mountains); and on the north and north-west by the Casdusi, Atropatene, and Ararat. The latter was part of the modern Irak Ajemi. Atropatene, which corresponded to the modern Azerbaijan, extended as far north as the Araxes ( Arsas); it was much less fertile than Great Media, and does not appear to have been included in the Media of Herodotus. It derived its name from Atropates, who successfully opposed the Macedonians, and established an independent monarchy, which continued till the time of Strabo (p. 522, 523, Casaleun, notwithstanding its proximity to the Armenian and Parthian dominions.

The capital of Great Media was Abyziana, or Ecbatana (Hamadan), the summer residence of the Persian kings. [Ecbatana.] South-west of Ecbatana was Bactana, or Bagistana (Beistoon), situated on the great commercial road which, beginning at Ctesiphon, passed through the mountains of the territories of the Caspians and Zagros, and terminated at Ecbatana. This commercial road, which is determined by the physical character of the country, lies continued in use to the present day. In the north-east of Great Media, near the Caspian gates, was the kingdom of Cappadocia, afterwards united with the Macedonians, and Armenia by the Parthians, which was founded, or rather colonized, by the Macedonians under Seleucus Nicator. (Strabo, p. 524.) This town of, which the ruins are still visible at Ras, is frequently mentioned in the apocryphal book of Tobit, as the place where many of the Jews resided, who had been carried away captive by Shalmaneser. There are several passes through the Elburz mountains, to the south-east of Tehran, in the neighbourhood of Ras. Near Rahagme was the Persian plain, celebrated for the large numbers of horses which, in times past, the ancients went in Asia. Strabo informs us that there were 50,000 horses reared in this plain in the time of Alexander, and that there were formerly as many as 150,000. (Herodot., ii. 106., vii. 40.; Arrian, vi. 12.; Strabo, p. 525; Arriano, 18.)

The mountainous country in the south-western part of Great Media was inhabited by several warlike tribes, who maintained their independence against the Persian monarchy. Strabo the Athenian, in his travels for the med. (p. 526), says: the Medes, bordering on the north-west of Persis; the Uxii and Ellymaei, east of Susiana; and the Cossami, south of Great Media. The king of Persis was obliged to pass through the country of the latter whenever he visited Ecbatana, and could expect no more than a passing visit. The most powerful of these tribes were the Kaduci or Gelas, whence the modern name of that part of the country (Gilan) is probably derived.

According to Herodotus the Medes were originally divided into six tribes, the Bactae, Parataxae, Strachae, Aramani, Bactani, and Chius. (Herodot., vi. 62.) ; which word appears to contain the same root as Araxia, the ancient name of the Persians (Herodot., vi. 61.) It is not improbable that this name was originally applied to most of the Indo-European nations. Xerxes speaks of the Arii as one of the most powerful of the German tribes (Germ., 43.); and India proper is called, in the most ancient Sanskrit works, Aruva-varta, ' holy land.' The same name was retained in the province of Ariana, and is still employed in the East as the proper name of Persia (Iran).

Media originally formed part of the Assyrian empire, but its history as an independent kingdom is given differently by Herodotus and Ctesias (whose account is preserved in Diodorus), as to render it probable that the narrative of Ctesias must refer to a different dynasty from that of ancient Asia. Ctesias makes the Median monarchy last 226 years; and as Media was conquered by Cyrus about B.C. 560, it follows that the Median monarchy would commence, according to his account, about B.C. 782. Herodotus, on the contrary, assigns to the Median monarchy a period of 123 years, which, including the 28 years during which the Babylonians had possession of the country, would place the commencement of the Median monarchy about B.C. 716. The founder of the Median empire, being for the Medes, went to Ctesias, who reckons eight kings from him to Astyages.

According to the account of Herodotus there were four kings of Media: 1. Deioces, who reigned B.C. 760-727. 2. Phraortes, B.C. 657-635, greatly extended the Median empire, subdued the Persians, and many other nations, and fell in an expedition against the Assyrians of Ninniveh. 3. Cyaxares, B.C. 635-595, completely organised the military force of the empire, and extended its boundaries as far west as the Halys. In an expedition against Niniveh, he was captured and executed by Belshazzar. 4. Astyages, B.C. 595-539, was overthrown by the Scyths, and was succeeded by Arsa, or Arsinohis, son of Cyrus, and Media reduced to a Persian province. The history of the rise of the Persian monarchy is related very differently by Xenophon, who also makes a fifth Median king, Cyrus II., succeed Astyages.

The Persians were a mixture of Semites and the people of Darius II., the father of the younger Cyrus, about B.C. 400, but were again subdued. (Herodot., i. 130.; Xenoph., Hellen., i. 2, § 130.) They do not appear after this time to have made any further attempt at recovering their independence. On the downfall of the Persian empire they formed a part of the kingdom of the Seleucids, and were subsequently subject to the Parthians.

MED'DICI FAMILY OF. The early history of the family of the Medici is obscure, although some authors go so far as to say that it was founded by Median colonists. But it must be remembered that these genealogies were made after the elevation of this family to supreme power in Florence. It appears however, from authentic monuments, that many individuals of this family had signified their descent on such occasions. Giovanni de' Medici, in the year 1251, with a body of only one hundred Florentines, forced his way through the Milanese army, and besieging the fortress of Scarparia, and entered the place with the assistance of twenty lives. Sallustio de Medici acquired great reputation by his temperate but firm character, and his constancy in the hour of danger. His power, accorded those who opposed them of being attacked to the party of the Guibelins, then in great odium at Florence. The persons so accused were said to be armiuntati (abolished), and by that act were excluded from all offices of importance, on all occasions. Gustave de' Medici, in the year 1563, with fifty of his followers, was chosen chief magistrate, exerited his power to reform the abuses, which was not however effected without a violent commotion, in which several of the nobility lost their lives. After the death of Salustio, his son, Ver de Medici, continued in the favourable circumstances which the house of Medici attained
its political power is indicated in the charge given by this venerable old man on his death-bed to his two sons, Cosmo and Lorenzo: 'I feel,' said he, 'that I have lived the time prescribed me. I die content; leaving you, my sons, in influence and in health, and in such a station, that whilst you in influence uphold the great name of my house, you will maintain that influence of the state, if you would live with security, except only such as are bestowed on you by the laws and the favour of your fellow-citizens; for it is the exercise of that power which is obtained by violence, and not of that which is voluntarily given, that occasions hatred and contempt.' He died in the year 1428, leaving two sons, Cosmo, born in the year 1389, and Lorenzo in 1394, from the latter of whom is derived the collateral branch of the family, which in the beginning of the sixteenth century obtained the absolute sovereignty of Tuscany.

Even in the life-time of his father, Cosmo had engaged not only in the extensive business by which the family had acquired its wealth, but also in the affairs of state. Such was his intercourse with the great men of Italy, that when Balthasar Cosma, who had been elected pope, and had assumed the name of John XXIII., was summoned to attend the council of Constance, he chose to be accompanied by Cosmo de' Medici, among other men of eminence, without his father's knowledge. When the committee of the pope, which continued nearly four years, Balthasar was deprived of his pontifical dignity, and Otto Colonna, who took the name of Martin V., was elected pope. Cosmo did not desert in adversity the man to whom he had attached himself. When Balthasar, on his return to Florence as papal legate, he redeemed him from the hands of the duke of Bavaria, who had seized upon his person; and afterwards gave him an hospitable shelter at Florence during the remainder of his life. The successful pontiff, instead of resenting the kindness shown him to a public enemy, wrote a letter to the city of Florence, where, on the formal submission of Balthasar, and at the request of the Medici, he created him a cardinal, with the privilege of taking the first place in the sacred college. The new-made cardinal died in 1419, and it was rumoured that the Medici at his death possessed themselves of immense wealth which he had acquired during his pontificate. This rumour was afterwards encouraged by those who well knew its falsehood. The true source of that supposed treasure was an abundant and successful speculation in business, and the property of the cardinal was scarcely sufficient to discharge his debts and legacies.

The authority which Cosmo and his descendants exercised in Florence, during the fifteenth century, consisted largely of wealth and influence. In the new state of things the Medici exerted this influence with great prudence, yet owing to the discontent of the Florentines with the result of the war against Lucca, a party arose, headed by Rinaldo de Albizzi, which, in 1433, after killing the magistrates with their own adherents, seized Cosmo, and committed him to prison. He was afterwards banished to Padua for ten years, and several other members and friends of the Medici family were treated in the same way. From Florence Cosmo proceeded immediately towards Venice, where he was received with marked respect, and there met with at Venice induced him to fix his abode there. Within a year of Cosmo's retreat, Rinaldo was obliged to quit Florence; and Cosmo was recalled, and returned amidst the joy and the exultation of the people. The gonfalonieri, or state-bearers, the executive authority who bore his name, with a few others of his party, were put to death on the occasion. Measures were now taken to restrict the choice of magistrates to the partisans of the Medici, and alliances were formed with the neighbouring powers for the purpose of supporting and perpetuating the new system of administration in Florence. The subsequent life of Cosmo de' Medici was an almost uninterrupted course of prosperity. The tranquillity enjoyed by the republic, and the satisfaction which he experienced in the esteem and confidence of his fellow-citizens, enabled him to indulge his taste for the promotion of science and the encouragement of learned men. Though a private citizen, he surpassed almost all the princes of Europe in his munificent patronage of literature and the fine arts. He assembled round him some of the most eminent men of the age, who had begun to study the Greek language and philosophy. He established at Florence an academy expressly for the explanation of the Platonic philosophy, at the head of which he placed the celebrated Marsilius Ficinus. By means of foreign correspondents, he communicated with all the leading men, whose works were brought to Florence, which formed the basis of the Laurentian library; nor was he less liberal in his encouragement of the fine arts. During the retirement of his latter days, his happiest hours were devoted to the study of letters and philosophy, and the conversation of learned men. He also endowed numerous religious houses, and built an hospital at Jerusalem for the relief of distressed pilgrims. The spirit of his administration was moderate, he avoided all appearance of state which might give colour to the charge of being a tyrant; and, by way of increasing his interest among them, he confined the marriages of his children to Florentine families. By this prudent conduct and his benevolence, he acquired the title of 'father of his country,' which was inscribed upon a monument which, from the beauty and the exalted real merit, has ever since been attached to the name of Cosmo de' Medici. He died August 1st, 1464. Cosmo de' Medici married Contesina Bardi, of a noble and illustrious family, which had been long distinguished at Florence. By her he had a son, Giovanni, and one daughter, Isabella; and he had a natural son by a mistress.

Giovanni de' Medici was one of the Florentine ambassadors who were sent, in 1453, to take the necessary oaths to Calixtus III., who had succeeded Nicholas V. He was on the list of Cosimo's favourite sons, on account of the time of Cosimo's death, in 1464, on account of the infirmities of his father, Lorenzo had been introduced to a knowledge of public affairs, although then only in his sixteenth year. With this view he was sent to visit the principal courts in Italy. Upon the successor of Sixtus IV. to the papal throne, he went, with other citizens of Florence, to congratulate the new pope, and was invested with the office of treasurer of the holy see; and while at Rome took every opportunity to add to the wealth and dignity of the Medici family. One of the first events after he undertook the administration of affairs was a revolt of the inhabitants of Volterra, on account of a dispute with the Florentine republic. By the recommendation of Lorenzo, force was used, and the result was successful. Then he established the academy of Pisa, to which city he removed in order to complete the undertaking: he selected the most eminent professors, and contributed a large sum from his private fortune, in addition to that granted by papal authority. Lorenzo, who was, or affected to be, an admirer of Plato, took an active part in the establishment of an academy for the cultivation of the Platonic philosophy, and instituted an annual festival in honour of Plato. Whilst Lorenzo was thus dividing his time between the administration of the state and the promotion of literature, the Pazzi,
a numerous and distinguished family in Florence, formed a
conspiring to assassinate Lorenzo and his brother. Gui-
liano was killed, but Lorenzo escaped. The people, who
were attached to the Medici, collecting in great numbers,
paid to death or apprehended the assailants. Salviati, arch-
bishop of Pisa, was hung through a window of his palace,
pulled in to death, and cut to pieces even of his robes;
and Jacopo de' Pazzi, with one of his nephews, shared
the same fate. The name and arms of the Pazzi family
were suppressed, its members were banished, and
Lorenzo rose still higher in esteem, and more affection
for his father. Sienese IV., who was a party to this con-
spiracy, excommunicated Lorenzo and the magistrates of
Florence, had an interdict upon the whole territory, and,
forming a league with the king of Naples, prepared to in-
vade the dominions of the Grand Duke. The surrounding
potentates, and he zealously supported by his fellow-citizens. Hostilities were commenced, and
carried on for two campaigns. At the close of 1479, Lo-
rentzo took the bold resolution of paying a visit to the
king of Naples, and, on his return to Florence, lodged
himself with friends, and spent the time in writing
letters to his principal friends, on the subject of his
affairs. He was, in fact, making a very important
move, which it was now necessary that he should be
accompanied by: this was the birth of a son, whom
a lady of the family of Goriini had borne to Giuliano about
twenty months before his death, and whom Antonio had
taken into his household, and who, according to the
charity of Giulio. Lorenzo immediately repaired to the place
of the infant's residence, and, taking him under his protec-
tion, delivered him to Antonio, with whom he remained until
he had arrived at the seventh year of his age. This
concealed son was, however, not his. When the Pope had
supplied the untimely loss of a father, was destined to
act an important part in the affairs of Europe. The
final extinction of the liberties of Florence, the alliance of
the family of Medici with the royal house of France, the ex-
clusion of the Papal legates from Siena, the capture of the
Romans Church, and the consequent establishment of the
dominions of the reformers in this island, are principally
to be referred to this illegitimate son of Giuliano de' Medici,
who, through various vicissitudes and fortune at length ob-
served the supreme direction of the Roman see, and under
the name of Clement VII. guided the bark of St. Peter
through a succession of the severest storms which it has
ever experienced.

Pierlorenzo, the first son of Lorenzo, succeeded him in the
administration of Florence. Politian said that his father
had a favourable opinion of his capacity, but it soon
appeared that he was unequal to the task of government.
With the view of obtaining the sovereign power at Flo-
rence, he formed an intrigue with another who was in the
confidence of the king and the king of Naples. On the entrance of the French
into Italy under Charles VIII. he deserted his allies.

As soon as the French king reached the confines of the
Florentine state, Piero had a secret interview with him, in
which he was lavish in his offers to promote the interest
of the king, and as a pledge of his fidelity surrendered to him
the important fortress of Sarzana, with the town of Pietra Santa, and the cities of Pisa and Leghorn. Charles under-
took to restore these places as soon as he had accomplished the
scheme that was the object of the invasion of Italy, and he had
promised to retire after this disgraceful compromise, Piero was refused
admission into the palace of the magistrates, and, finding the people were so highly exasperated against him as to
encourage his personal safety, he hastily withdrew himself
from all their cities. The Florentine inhabitants of Italy experienced in consequence of the French invasion belonged to the general history of Italy. The
plundering of the palace of the Medici, and the devastation
of the city of Florence, were attended by the death of the
head of the family, who, on the death of the Medici, were among the misfortunes that befell Florence. The French troops, which had entered the city
without opposition, led the way to this act of barbarism,
in which they were joined by the Florentines themselves, who
openly carried off or made away with whatever was valuable or
bearable to the Medici, and among the misfortunes that
disastrous event. Thus the Medici were deprived of their
stately palace and the chief ornament of the city. Exquisite pieces of ancient

by his liberality. To the latter he not only allowed compen-
sing stipends while they attended to their studies, but gave
considerable premiums as rewards of their proficiency. To
this institution, more than to any other society, Roscoe ascribes the sudden and astonishing advance which,
within the close of the fourteenth century, Made in Italy,
the arts, and, which, commencing at Florence, ex-
tended itself to the rest of Europe. In 1488 Lorenzo lost his
wife; and on the 8th of April, 1492, he sunk under a
slow fever, and expired in the forty-fourth year of his age.
Roscoe, in his History of the Arts, has given an
account of the celebrated physician, a person of great eminence
in his profession, is said to have hastened his death by mis-
taking his case.

By his wife, Clarice Orsini. Lorenzo had a numerous
family of five sons (Piero, Giovanni, and Giuliano), and
doubtless at least four daughters, of whom Paola was born
February 15th, 1471, Giovanni in 1475, and Giuliano in
1478. Giovanni was afterward known under the name of Leo X.; and Giovanni, having allied himself by marriage
with the family of Buonaccorsi, took the name of Francesco
De' Medici.

Of Giuliano, the brother of Lorenzo, Roscoe preserves an
interesting anecdote. Shortly after the attempt at assassina-
tion, he says, 'Lorenzo received a visit from Antonio da San
Gallo, who informed him that the untimely death of Gui-
oiano and the victory of his brother were a fruit of intel-

Lorenzo distinguished himself above all his predecessors by
the encouragement of literature and the arts. His own pro-
duction were sonnets, eclogues, and love poems, which he
wrote in his leisure.--compositions of this kind are very
rare, even in the work of poets, but with Lorenzo they are
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sculpture, vases, cameo, and gems of various kinds, were lost amidst the indiscriminate plunder, and the rich accumulations of half a century were destroyed or dispersed in a single day.

The subsequent history of Piero was a continual succession of mortifications and disappointments. In 1504, when Italy was invaded by Louis XII, Piero entered into the service of the French, his medicine was much prosecuted in which they were defeated by the Spaniards with great loss, upon the banks of the Garigliano. In effecting his escape he attempted to pass the river; but the boat in which he was, with several other men of rank, had embarked, broke up in the midst of the conflict, and Piero was thrown into the clutch of the enemy, and was carried as a prisoner to Florence, where he was kept prisoner for a considerable time in the factory of the Florentine people. He was afterwards released, and removed to Pisa, where he died five years afterwards, and was buried in the church of St. John the Baptist, at the foot of the statue of the Virgin and Child, in the church of the Prior of the same name.

The genealogy of the Medici to the present time is given in a splendid work but little known, entitled "Famiglie celebri Italiane," by P. Litta, still in progress. The Medicis are said to have been descended from a line of mediæval times, and to have been intimate friends of the house of Tuscany. For more minute details of the house of the Medicis, the several works may be consulted which this notice has been chiefly derived. (Modern Universal History, ed., vol. xxxvi.; Noble's Memoirs of the House of Medici, translated from the French by Sir R. Clayton, 2 vols. 4to., Bath, 1779; Roscoe's Life of Lorenzo de' Medici, 2 vols. 4to., Lond., 1796; and his Life and Pontificate of Leo X, 1 vol. 8vo., 1845.)

The medicine of the Medici at the present time is given in a splendid work but little known, entitled "Famiglie celebri Italiane," by P. Litta, still in progress. The medical sects comprised in "Fascescole XVII," in seven parts, folio, Milan, 1827-30.

MEDICINE. The earliest records of the practice of medicine are extremely obscure. Among the Jews, it appears to have been entirely confined to the priests, and the whole art seems to have been transmitted in the prevention of contagious and cleanliness, and the administration of a few uncertain remedies. The Egyptians, according to the account of Herodatus, have not made such little progress; purging medicines and emetics were well known to them, and they held doctrines on the structure of the body, and of the influence of medicines, and the effects of disease upon it; while the Egyptians maintained that such knowledge was not only unnecessary, but unattainable, and that simple experience should be the only guide to practice. The progress of the science has been greatly assisted by the observation of facts being neglected in the popular adoration with which each party argued its own cause, and the dispute only seemed to cease with the introduction of a new sect.

During the early periods of the Roman empire medicine seems to have been little cultivated, as is evident from Pliny (xxxii. 1), Rome was 600 years without professional physicians, though not entirely without medical knowledge. The first individual of any eminence who practised medicine in Rome was Asclepiades of Bithynia [ASCLEPIADES], who lived in the court of the Emperor Hadrian, and was one of the Christian era; but he does not appear to have advanced the knowledge of the science. He was succeeded by his pupil Themison, the founder of a sect called Methodics, who held doctrines on the nearly identical sects of both the Dogmatists and of the Empires. A science may be formed by the succeeding physicians attached themselves to this sect, and among them were Soranus and Aurelius, whose writings are the principal that remain of this period.

About two thousand years were divided into numerous sects, as the doctrines of particular physicians became more generally received. The chief of these sects were the Pneumatics and the Eclectics. The former are represented by their most eminent writer, Aratus [ARKATUS], who lived in the reign of Vespasian, and the chief points of their doctrines are detailed in his life. Of the Eclectics, the most celebrated was Archigenes, of Apanaca, who practised at Rome in the time of Trajan. But the most remarkable writer of this age was Celsus, in whose work, "De Medicina," the principal principles of medicine are declared successively and during his life are amply detailed. [CELSUS.] He was the first native of Rome who is known to have studied medicine, and the only one who did so with success. In his time medicine, which, as a science, might be said to have had its original form, had made considerable progress; the several sects of its professors differed rather in their pretensions than in any important point of knowledge; the philosophical learning, which some sought and others despised, was an entirely hypothetical, and had relation only to the doctrines of the mutual actions of imaginary atoms, elements, and spirits, but all had been alike engaged in the study of practical medicine, and their accumulated experience had by this time formed a very considerable and useful fund of knowledge.

The individual whose history forms the next chief epoch in the history of medicine is Galen; but it will be unnecessary to repeat what has already been said of his doctrines and practice. [GALEN.] For a long time after his death he continued to be the great authority in all medical works, and imitating, as closely as they could, his practice. His writings were regarded as ultimate authority, and everything that seemed opposed to them was at once rejected. From the time of Galen to the seventh century the only names of any repute (and of whom substantial works) are those of the mediaeval Hippocrates, Orbulius, Athius, Alexander Trallianus, and Paulus of Ephesus; and after the death of the last of these, no medical work of the least merit was published in the Greek language.

From the seventh to the twelfth century the only nation in which medicine made any progress, or was even prevented from retrograding, was the Arabian. It appears that in
the conquest of Alexandria some books were saved from the burning of its magnificent library, and that among them were the writings of Hippocrates and Galen. The latter were soon translated into Arabic and diligently studied; and all the earliest Arabics worked on medicine, as those of other nations do, on the principles laid down by their contemporaries, little more than transcripts of those of Galen. One of the most illustrious of the Arabian school was Rhazes, who was born in the ninth century, and whose works contain many original observations, of which some are remarkable. He was the first to demonstrate the origin of the systematic practice of chemistry among his countrymen. After Rhazes was Ali-Abbas, and after him Avicenna, who attained the highest repute of all. He was born in 986, and has left voluminous writings, but such a one appear to show that his fame is deserved only when he is placed in comparison with his contemporaries. Neither Avicenna nor the later writers, Mosue and Alhucema, contributed anything of importance to the progress of medicine. Alhacen and Alhucema were distinguished for their astronomical knowledge, and as natives of Spain, wrote in the Arabic language. The former was the precursor of the latter, and lived in the eleventh century, and his works are among the few that exhibit even slight departures from the doctrines of Galen. The circumstances under which the period of the Arabian school of medicine, the more correct description of several diseases, the first records of some new and important ones, and the introduction of several valuable remedies, both from the vegetable products of the tropical and oriental countries, and from the chemical processes which were then first brought into general use. But the physicians adhered too carefully to the doctrines of Galen to make much progress in their science; and anatomy, physiology, and pathology appear to have been almost entirely neglected.

The decline of the Arabian school in the twelfth century to the beginning of the sixteenth, the history of medicine presents few circumstances of interest. The dissection of the human body was first publicly practised by Mondino de Luzzi about the middle of the thirteenth century, though Montepelier in the thirteenth, those of Bologna, Vienna, and Paris in the fourteenth, and in the fifteenth those of Rome, Padua, Pavia, and several other cities in Italy. By means of these, and by the impetus which, with other sciences, it gave to the invention of the microscope, medicine again commenced a forward course. In this country it derived the greatest advantages from Linnaeus [Linnaeus] and the establishment of the college of physicians, to whose members, in succeeding years, several of the most brilliant discoveries in the science of chemistry were due. In the fifteenth century the sect of chemical physicians arose, and their doctrines, under the bold advocacy of Paracelsus, who publicly burnt the writings of Galen, obtained considerable credit and numerous supporters. The main assertion was that the operations of the living body are entirely governed by the same chemical laws as those which control inorganic matter; and the works of all the writers of the fifteenth century are filed with arguments in support of this, and so many of their propositions seem to have been so many repetitions of those of Galen. The Galenists were of course the more learned party, who were well versed in the ancient books; while the chemists were chiefly those who were more practically skilled in the arts of that newly discovered science. Neither party can be said to have left a serious and honest hand in the work; but in the middle of the sixteenth century the most important improvement commenced in the diligent and accurate study of anatomy by Vesalius [Vesalius], who, disregarding the general obloquy which was incurred, carefully studied the structure of the most important parts of the human body.

From the time of Vesalius, the study of anatomy was diligently pursued, and in the early part of the seventeenth century was rewarded by several of the most interesting and important discoveries; as that of the circulation by Harvey [Harvey], of the absorption by Ambellius, of the process of respiration by Malpighi [Malpighi], and numerous others. Among the most celebrated men of the seventeenth century, may be enumerated Glisson, Bartholin, Rudbeck, Fabricius, Hooke, Sylvius, Willis, Raulin, Malpighi, Balbus, and Bellini. All those worked on medicine in the diligent pursuit of anatomical and physiological knowledge; and, somewhat later, Sydenham again introduced a truly Hippocratic mode of observation of the phenomena of disease in its symptoms, causes, and effects, and in the influence of the remittent and remittent phases of the phenomena. In the case of the naturalists and the practical physicians, medicine in this century made the most remarkable progress, although it was in some measure checked by the attempted application of the laws of mechanics then, from the discoveries of Newton and his contemporaries, effectually directed the phenomena of the living body. The astro-mathematicians, as those who supported this theory were called, were long engaged with the chemists, who had already conquered the Galenists, in the controversy about the hypothesis that the Vitalists, founded by Van Helmont [Helmont], which at last obtained complete ascendancy over both. The Vitalists held that there is in the living body a principle (upon which different members of the sect concurred) which directs and controls every action of the body over and directs all the processes of the living body, and is directly opposed to the influence of chemical and mechanical agents. Staith, Hoffmann, and Boerhaave were of this school, though each considerably modified the opinions of his predecessors.

Among the pupils of Boerhaave were Van Swieten and Haller. The former adopted the hypothetical spirit of the school too closely to add much of real value to medical science; but the latter may be fairly considered to have reconciled the mechanical and vital views. His great work, the time of Haller, the cases of Harvey, Glisson, Malpighi, and others, who devoted themselves to the simple observation of facts and the evident deductions from them, were exceptional; but since his time, the exceptions have far outstripped the rule. With a comparative neglect of observation, they have endeavoured only to find or support some theory by which all the phenomena they met with might seem explained. Haller's contemporary Cullen [Cullen], though he yielded much more to theory, was of eminent service in the study of practical medicine; and his exposition in Brown is acknowledged to have introduced many useful lessons in the same branch of the study.

With the gradual oblivion of the hypotheses of both Cullen and Brown, the theoretical study of medicine may be looked upon as having entered into the eighteenth century, and perhaps we may say of the day we may certainly be said to be without any general medical theory. From the time of Haller, medicine has acquired more and more nearly the character of a science of visible observation and the patient investigation of facts. Its history, on the other hand, has been the history of a series of discoveries, each perhaps small when compared with the vast amount of knowledge still unexplored, yet altogether so numerous that even a sketch of them could not here be introduced. They will, however, therefore be referred to the several articles on the different branches of medicine and their collateral sciences, and to the lives of those who have been most conspicuous for discovering them.

MEDIC, a corruption of Medicago, is a name given to different plants belonging to the Papilionaceae division of the Leguminous order. Black medic is Medicago lupulina; purple medic is M. sativa, or luteum; yellow medic is M. falcata. They are all agricultural plants, and of considerable importance for the formation of cake manure, and are cultivated as forage plants. [L. cercis.] Black medic, also called black monachus, is sometimes sown by farmers in dry gravelly soil as the commencement of a pasturage; unless sheep fed, it lives only for a couple of years, but during that time it forms large curds, and is a good food for cattle; but if sown with it the cover and take its place; but if closely fed by sheep or other animals, it becomes a true perennial, and forms a valuable part of the herbage. Its name is derived, not from the colour of the flowers, for they are yellow, but from the black. It is a hardy plant, and black, and clustered together at the ends of the branches. That it should be supposed to be the same as hop-trefol would have scarcely been credible, did we not possess evidence of the fact in one of the best of our English works on agriculture; this latter plant resembles it in the leaves.
and flowers; but the latter, when the pols are ripe, cover them over in such a way as to produce the appearance of a head of hop-flowers. Yellow medic is only grown in very poor soils in some parts of Europe; in England it is not an agricultural plant, but is found wild on the tops of old walls and on ancient ruins, which it clothes with a green herbage, and on ancient walls, where it produces a jet black dye. There is room for its long roots to extend themselves. Tree medic (Medicago arborea) is a large bush in the south of Italy, and was doubtless the plant called Cytisus by the Romans.

MEDITERRANEAN. [ARABIA.] MEDITERRANEAN (or Midland-Sea), the name of the sea between the Straits of Gibraltar to the west and the Dardanelles and Syria to the east. This sea was antici-
tently called The Sea, or the Great Sea, by the Jews. The Greeks, from whatever points they first proceeded, would soon

Pliny appears to have given no general name for it. The term Mediterranean is not applied to this sea by any classical Latin writer. It was called bah-roum, or the sea of Rome, by the Persians.

The Mediterranean is comprised between the parallels of 20° 13' and 45° 50', and the meridians of 10° 30' W. and 36° 10' E. The distance from Gibraltar to the farthest shore of Syria is 2900 miles, and the narrowest part, between Sicily and Africa, is only 90 miles. The basin, including the islands, occupies an area of 734,000 square miles. The surface of country of which it receives the drainage is very difficult to estimate, but may be assumed to exceed this quantity. On the shores of this sea have been transacted the most important events in the history of mankind, and its character seems to mark it as the theatre best adapted to the complete and rapid civilization of the race. From the great diversity of soil and productions, under a varied and favourable climate, the colonists, from whatever points they first proceeded, would soon require those different habits under which their several energies and capabilities would be developed. The comparative shortness of the distances of the several places, by rendering navigation easy and pleasant in small and imperfect vessels, would, by facilitating intercourse from an early period, tend to diffuse and to promote civilization; while commerce, by bringing together men of different habits, manners, and languages, and thus circulating practical information, would supply the materials for the perfection of the state.

As a notice even of a cursory kind, of countries and cities whose history is connected with almost every history in the world, would greatly exceed our limits, we shall confine ourselves almost entirely to those points which concern our subject. From the nearest coast of Syria is the island of information to the particular names. We shall therefore take a short view of the shores, beginning at Syria and proceeding along Asia Minor to Gibraltar, and return along the coast of Africa to Egypt, noticing some remarkable points, which are connected with commerce, war, and the arts; and, in short, with all that is essential to the well-being of a nation.

The shores of Syria, the general name of the country between Anatolia and Arabia, are mountainous between Tripoli and Tyre, but present in many places a large extent of low and flat coast. The climate is excessively hot in summer, and the winter often severe. The chief ports are Alexandria and Tyre, and the navigation here is confined to small coasting vessels; but under the oppressive and ignora-
tant government of the Turkish pashas it is very small. Tyre, and Sidon, afterwards still more famous, are reduced to failing villages. Though the country was antici-
tently inhabited by the Phœnicians, who are the most ancient inhabitants of the country, there is little or nothing remaining of their ancient monuments, but they have been found bearing inscriptions.

The coast of Anatolia, the west portion of Asia Minor, is mountainous, rising in some parts very near the sea to 7000 and 8000 feet. It is now a Turkish province. About 20 leagues to the south of Asia Minor, and connected with it by a narrow isthmus, is the island of Cyprus, where the greatest number of Phœnician inscriptions have been found, though none of a date prior to three centuries before Christ. The island of Caudia, the name given by the Venetians to the ancient Crete, is highly fertile, productive, and beautiful, but has little trade. The city of Candia stands in the port of the same name; Suda is a fine port. The island of Rhodes, celebrated for the first code of maritime laws, for its schools in the time of the Romans, and in the wars of the Knights of Jerusalem against the Turks, is situated in the south-western corner of Asia Minor, and is now in the hands of the Turks. It produces wine, fruit, and pine-timber.

The numerous islands in the sea called the Aegian Sea, between Greece and Asia Minor, forming the Grecian Archipelago, are of several kinds and degrees of beauty, and afford delightful sailing in summer, but they are subject to very heavy squalls. The sides of the islands being steep, and the water very deep, there are in general no anchoragest but in particular places. Delos, celebrated for its port and oracle of Apollo, Corinth, the head of the sea was at one time noted for its trade in slaves. It declined in the wars of Mithridates. Scio, a high and beautiful island, covered with the gardens of the Greek merchants, of whom it was the favourite resort, was massacred by the Turks in 1822. Milo is the residence of the patriarch of the Archipelago. The Archipelago and its coasts contain many high moun-
tains, as Athos, 6774 feet high, and many others. Smyrna, a place of high antiquity, is the great commercial entrepôt in this part of the world. The chief of the produce of the islands is wine, drugs, and fruits, for which ships carry manufactured goods, sugar, corn, &c. Tenedos, opposite the site of Troy, retains its antient name.

On the opposite side of this sea is Salonica, a large city of 70,000 inhabitants, as the seat of an archbishopric. The trade is good and the trade considerable, but there is no harbour. The islands Spezzia, Hydra, and Poros, which are near the coast of the Morea, have become distinguished of late years for maritime enterprise.

The coast of the Morea, the antient Peloponnesus, is moun-
tainous, some of the summits exceeding 6000 feet. The country is verdant and of an agreeable aspect, but not well wooded; the productions are numerous, but the trade small. It was given up by the Turks in 1830, to form a part of the new Kingdom of Greece. Corinth, on the head of an arm of the sea, and on the isthmus which joins Livadia to the Morea, formerly renowned as one of the most splendid and luxurious of cities, is now a small town exhibiting a few remains of its antient architecture. Athens, beyond the isthmus, is the most populous town of Greece, and has been increasing in importance since the commencement of the reign of Otho, the first king of Modern Greece. It is not a place of much trade.

The coast of Albania, including the antient Illyricum, is more mountainous and more rugged; the roads are more barren and more athletic than those to the southward. It is now part of the kingdom of Greece; it has but little trade. The known harbours are Antivari, Dulcigno, Durazzo, Valona, Corfu, Lepanto, and Provenza. Off this coast is the Morea, the lie of the Ionian islands. The great town of Corfu, the antient Cynora, is the seat of government, which is carried on in the name of the Republic of the Seven Islands, and which is placed under the protection of Great Britain by the treaty of Vienna, 1814. Corfu is picturesque, fertile, and wooded. Cefalonia has a more dreary aspect: it contains a mountain 5380 feet high, which is a conspicuous landmark. Inside Cefalonia is Ithaca, now called Teaki, the native place of Ulysses. The fertile island of Zante, famous for its currants, is to the south of the Ionian islands. When we enter the Adriatic, the entrance of which is 40 miles broad. The shores of Dalmatia and Istria afford numerous fine harbours, and are covered towards the interior with extensive forests of timber, much of which is fine oak. In Dalmatia is Ragusa, a republic of Venetian origin, and whose flag, prior to the French revolution, was known even to our own shores. Above Ragusa the eastern shores are studded with islands affording good anchorage.

The Greeks, especially the Hydriot, are active sailors. They employ both carrying and coasting vessels; both sail and pull, but they seldom venture to sea except in fine weather or with a fair wind. The trade to the Black Sea is chiefly carried on in Greek bottoms.

Trieste, the chief port of Austria, is a large and handsome city, and a place of great trade, exporting wool, tobacco, and the produce of the mines of Hungary. It is a free port. Venice, founded in the fifth century upon numerous small low islands at the mouth of the Po, celebrated as the entre-
pôt of the commerce between Europe and the Levant, which was at its maximum about the fourteenth century, is still a place of considerable trade, though its wealth and commerce have declined. The chief exports are corn, timber, silk, glass, &c. It has very fine and extensive fisheries. Of its manufactures, the pottery, in Venice, in hour, is one of the best in the world.

The chief port on the south coast of France is Marseilles, at the mouth of the Rhône, said to have been founded by a colony of Phocaeans, who, from the great trading facilities of the place, extended their possessions along the shores on both sides. Amongst these are Frejus, where Bonaparte was landed for Elba in 1814, and St. Marguerite, the island of from Elba in 1815. The Marseillais have been renowned as navigators. The principal exports are silk and wines; there is a great and increasing trade; and from 5000 to 6000 ships arrived in 1831. In the freshes of the Rhône the fish-market is one of the most picturesque in the world, and the Marseillais are famed for the excellence of their cuisine. The mind watered in this manner in the late war.

Toulon is the great naval arsenal of France. The Gulf of Lions, like all the gulfs on the north shores of the Mediterranean, is subject to violent gales from the northward, which sometimes last three days. The islands of Sardinia and Corsica, lying north and south, extend over 80 leagues of the sea between Genoa and Tunis. The climate of Sardinia is mild, and the soil fertile. It exports corn, salted provisions, and fruit. The natives of the interior are savage. The Sardinians have few vessels of their own, the trade, even to the fisheries, being carried on by foreigners, principally Genoese. The shipping is chiefly French from Marseilles. Corsica is mountainous, rising in some parts upwards of 8000 feet: it produces nearly the whole of the island's wants. The principal exports are wine and a variety of stone. Ajaccio, situated on the bay of the same name, is remarkable as the birthplace of Bonaparte. The small island of Malta, composed chiefly of calcareous sandstone, is from its situation in the midst of the main channels between Sicily and Africa, and its excellent harbour, the gateway of the Mediterranean, and second in importance to Gibraltar. The island is productive, and the population dense. Malta was ceded to the English in 1814. The Maltese are active sailors and are expert divers; their vessels are small but excellent. The east coast of Spain presents numerous harbours, and a highly fertile but not well wooded coast. The chief products are wine and olives and wool. The coast is particularly adapted to navigation by steam-vessels; but the disturbed and mountainous character of the country do not allow foreign steam-vessels to keep the trade in a very low state. The chief ports are Valence, which is a very handsome city; Cartagena, which is one of the finest harbours in the world; Barcelona, not adapted to large ships; Almeria, and Malaga.

The Balearic Islands, Majorca, Minorca, with Ibizca, one of the Pitiusas, now under the Spanish government, produce wine, corn, fruit, and some manufactures. The chief harbours are Palma and Port Mahon.

The chief land-locked harbour is Minorca, on which is a very rocky mountain, 1430 feet high, is a place of extraordinary strength. Its situation, and the narrowness of the straits dividing Spain from Africa, which are only eleven miles across, Gibraltar in the line of the Mediterranean, and Corsica on the other hand, maintained that the waters carried off by evaporation, and returned again in the form of rain, would be precisely the same for the sea outside and inside the straits; and that the numerous rivers of the Mediterranean, by lowering down the water in the continental regions, would cause a supply of excess, which would require an outward current to carry it off. It had been taken for granted that the water of the Mediterranean must be saltier than that of the ocean, in consequence of the continual evaporation of a large amount of water. The proportion of 41 to 38. Dr. Marcet however found no difference. The saltiness furnishes the solution of the difficulty, and Mr. Tennant suggested that a comparison of the density at great depths would decide the fact. 'No bottom,' he said, 'below, since, if the density or intensity of saltiness increased with the depth, it would naturally follow that a much slower current below would be sufficient to carry off the excess of salt left by evaporation. Capt. Smyth, at the suggestion of Dr. Wollaston, obtained water
from the depth of 400 or 500 fathoms, and at 450 and 600 fathoms from the straits, in which Dr. Mallet detected no increase of salt; but in the water drawn from 670 fathoms depth, at only 50 miles from the strait, he found four times the usual quantity of saline matter; from which it would appear that a current below of only three-quarters of a mile an hour would prevent a ship from reaching the surface of the sea. It may be worth while to mention also that a story is told of a ship which sunk at Creta, opposite Gibraltar, having reappeared two miles farther to the westward. (Phil. Trans., 1819, 1822, 1829.)

Tyrus, the most populous city of Africa after Cairo, stands at the bottom of an extensive bay, from which it is separated by a shallow lake of intense saltness, from the continued evaporation under a hot sun, and on which are seen great numbers of flamingoes of a brilliant red plumage. The chief trade is with Marseille, to which the inhabitants export corn, the produce of these fertile countries now, as it was in the days of ancient Carthage. The ruins of Carthage, east of the Columns of Hecules, are described as such when the ground is strewn with small thin pieces of verd antique and red porphyry, are not the remains of the antient city, but of that which was built afterwards by the Romans.

It is remarkable that on the low shelving shores of parts of the Tyrrhenian coast, the strong northern winds do not blow homes, and that accordingly a ship may be upon a lee shore and anchor in smooth water.

Tripoli is the capital of the state of the same name. Proceeding towards Barca, the antient Ptolemis, we pass the Gulf of Sylvia, or Grotto Sarris, an object of so much dread to the antient seamen on account of marshes and sea-monsters. Capt. Smyth, who examined this coast, found that these terrors were poetical exaggerations of the difficulties of navigating a low and dangerous bay. Passing this bay, the Columns of Hecules, founded on a sandy neck of land by Alexander the Great, whose sagacity pointed out the situation as eminently adapted to commerce.

Alexandria, which was one of the greatest commercial cities that ever existed, began to decline with the invasion of Egypt by the Saracens. Under these warlike people the maritime trade of the East passed to the shores of Syria, and Alexandria further declined as Cairo flourished. The trade of the former was now confined to the cotton, flax, drugs, spices, &c. The ports of Cairo, on the low and fertile shores of the delta at the mouth of the Nile, are Rosetta and Damietta. Fresh water may be skimmed two or three miles outside the Damietta mouth.

The Mediterranean is the most doubt be of very early date. The story of Minos destroying pirates (Thucyd., i. 4) takes for granted the fact, that there must have been merchant vessels carrying something worth stealing from the earliest recorded period. If with Strabo we take for granted the accuracy of Homer's description, it by no means follows that the Greeks knew everything that could have been known to every other nation at that time; and the stories told of the jealousy with which the Phoenicians and Carthaginians guarded their discoveries, prove at least that the former were not possessed of the information in their possession; and with regard to these very nations, the knowledge in which the Greeks could have had of them, among other barbarians, must have been inferior to that which we possess in our day, of the learning of the Scriptures alone. One story of Utica having been established 130 years before Carthage, proves a regular communication between this place and Syria at a distance of upwards of 1200 miles; and we may conclude that occasional voyages of these enterprises prolonged the extended the bounds of knowledge far beyond these limits.

If the precise time of the discovery of places lying, as it were, in the thoroughfare of this sea, is so uncertain, the histories of the places in the deep bays of the northern shores must be still more obscure; we shall therefore give at once a slight sketch of the geography of this sea from Strabo, who wrote in the first century.

The stadium adopted by Strabo was that of Eratosthenes, 700 stadia making 1/2 of latitude or of longitude on the equator, or 60 nautical miles; hence a stadium is 0'0587 of a nautical mile, this last being about as much as a fathom. The Mediterranean was divided into three basins: the first comprised the sea between the Columns of Hercules and Sicily; the second, between Sicily and Rhodes; and the third, between Rhodes and the shores of Syria.

Strabo supposed that the parallel of latitude of 36° 3 passed through the Sacred Promontory (Capo St.Vincenti), between the Pillars of Heracles (or Gibraltar and Ceuta), dividing this part of the Mediterranean in the middle of its breadth, which was believed by navigators to be 5000 statute miles. Let us take these parallel of latitude to mean 36° 3, which is the parallel of the north coast of Africa, but which measures only 330. The sea here however lies altogether to the north of this parallel; and hence, as the configuration of the European shores seems to have been tolerably good, the coast of Africa must have been proportionately contracted. This parallel was carried through the straits of Sicily, Rhodes, and the gulf of Issus, now the gulf of Scanderoon.

In consequence of the above supposition, he placed Marsalla at a distance of 1000 stadia from Alexandria, at the mouth of the Propontis, the Chalcos, and the cape of the coast of Asia Minor, would coincide with the meridian: this error placed Byzantium too far to the north, and not far enough to the east of Alexandria, to the mouth of 12,000 stadia, or 1028 miles: it is only about 800.

From Cape Passaro (Pachyhum) to the west extreme of Crete he considered 4500 stadia, or 386 miles; it measures 400: and he supposed the length of Crete 3000 stadia, or 261 miles; it measures 250. The_chance occurs by Alexandria to the west end of 12,000 stadia, or 1028 miles: it is only about 800.

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Many of the latitudes given by Strabo are very near, that is, within 10'; those of Marseille and Byzantium excepted, for these are too little determined by the computation of much. The longitudes, which were all at that time referred to Cape Saarum as the first meridian, and the extreme west point, as he believed, of the known world, are without exception too small; that of Carthage, the nearest to the south, being not 30', and Alexandria, the most erroneous, 60' 40", too small.

Fruit is an important article in our Mediterranean trade: fast-sailing vessels are therefore employed to carry it, and a premium is paid to the first vessel arriving in the port of enough to the east of Alexandria, to the mouth of 12,000 stadia, or 1028 miles: it is only about 800.

This sea is navigated by vessels of no great size. There is a form of vessel similar to the larger vessel, called policia, which has originated in the suddenness and frequency of squalls, which often require the sail to be instantly taken in: for this purpose the masts are made in one piece, and the topsails in two, to love without interruption. The Mediterranean, being studded with places of refuge, and in which cars, though frequent and violent, never last so long as to wear the ship or the spirits of the men, and in which, besides, vessels have from the earliest period, have been enabled, the months, might indeed be favourable to training men to a certain degree of expertise in managing boats, but could never originate that seamanship on the grand scale which the long and boisterous sea-voyages, the rugged and dangerous coasts, and long winter nights, force upon the hardier sailors of the northern regions.

The winds have been remarked as peculiarly variable in the Mediterranean, and three or four vessels have often been seen carrying different winds at the same time. The
Mediterranean, or south-east wind, has always been noted throughout the Mediterranean for its depressing effects upon the animal system, and for a prejudicial influence still more surprising in other ways, as upon paint newly laid on, which does not dry afterwards. It is usually accompanied with a gloomy appearance of the sky, distinctly a feature in its effects, and little before slight. Water-sprouts are very common, and in the month of September the writer of this article saw sixteen together at one time.

The depth of the Mediterranean is without doubt very great, the plates being composed of the abyssal strata, and not of any other great expanses of water (as the Yellow Sea, the Baltic, and the English Channel), soundings are comparatively of limited utility.

The Mediterranean, though poetically termed a "tidal sea," no longer possesses its former importance in its latitudinal extent between Venice and the Lesser Syrtis it experiences a rise and fall of from five to seven feet. Tides are also felt, but somewhat irregularly, on the sides of the Gibraltar current, in the gulf of Corinth, and in the Faro of Messina. There is a curious reaction of the waters in the channel of the Euripus, between Greece and Neptune. Strong currents occur, especially near Venice and the Faro of Messina. The Archipelago currents are noticed in the articles Archipelago and Euxine, and the group of the Syrtis is mentioned in the article of Karamania. It has been stated that an easterly current prevails constantly along the coast of Africa and Egypt, but this, we believe, has not been substantiated.

The Mediterranean has been the scene of some very important naval actions. The first sea-fight on record was that between the Ionians and their own colony Corcyra, 644 B.C. The first engagement by sea which has been described was that between the Persians, in the reign of Darius, and the Ionians in Asia; it ended in the battle of 493 B.C. Thirty years after this was the famous battle of Salamis, in which the fleet of Xerxes was destroyed. Numerous sea-fights took place between the Greeks and Persians, and amongst the Greeks themselves, and also between the Carthaginians and the Romans. The most important of these was the action in which the Carthaginians were beaten by the Romans under Duilius, 260 B.C., and which was the first action of the Romans at sea. The most curious circumstance recorded, namely, that the Carthaginians were entirely unharmed by the impact of the solid piece, is unknown. The general of his order Cursidragas (the 2nd) is provided with this solid piece (Cimbroraga, vol. viii.), but those of his first order, Pulmogadra, have no such support. Under the Pulmogadra he arranges the numerous thalamoi of the wall, and each of them is supported by a strong pier. The reader will find a sketch of the most approved systems, and a description and illustration of some of the most remarkable forms, as far as our limits will permit. [PULMOGRADA.]

MEED WAY, KANSAS,

MEERMAN, JOHN, son of the preceding, was born in Leyden, in 1728, and in 1748 became pensionary of Rotterdam. He spent the greater part of his life in learned research, chiefly relating to law. He died at Aix-la-Chapelle, December 15, 1771. His two great works were, ' Novus Thea- rius Juris Civilis,' 7 vols., 1741-43 (to which son added an eighth volume in 1780), and his 'Origines Typographicae,' 2 vols. 4to., Hague, 1764. An analysis of this last work was published in 'The Origin of Printing, in two Essays,' 8vo., Lond., 1774, by Meares. Bowyer and Nichols in the 'Antient History of the English Language,' which was to establish the claims of the town of Harleian to the invention of printing. (Bibl. Universelle, tom. xxvii.)

MEERMAN, JOHN, son of the preceding, was born in 1755. His earliest literary effort was made at the age of ten years, in a translation into Dutch of the 'Dutch Garce' of Molère. He commenced his regular studies at Leyden, and afterwards prosecuted them at Leipsig under Ernesti, and at Göttingen under Heyne. At different times in his life he visited nearly every country of Europe. His contributions to the 'Lookt Nghệ' have been already mentioned. The most important of his other works were: 'Specimen Juris Publici de Solutione Vinculi quod olim fieri sancrum Romanae Imperii in Ecclesia habuerat,' 4to., Hagen, 1774; 'A History of William, Count of Holland, King of the Romans,' in Dutch, 5 vols. 8vo., 1783-97; 'Remarks during a Tour in Great Britain and Ireland,' 4to., Hagen, 1787; 'An Historical Account of the Prussian, Austrian, and Sicilian Monarchies,' 4 vols. 8vo., Hagen, 1793-4;

nible surveys of great part of the shores both of Europe and Africa, which he completed in the Adventure in 1724, and which have appeared in his chart of the Mediterranean. In 1816 M. Hell, with French officers of engineers, made a detailed survey of Corsica; and M. Gautier extended a examination of the shores of Africa. After his effecte
'Historical Account of the North and North-East of Europe,' 6 vols. 8vo, Hague, 1804-6; 'A Narrative of the Siege and Conquest of Leyden by John duke of Bavaria, in 1429,' 8vo. Loyden, 1806; all in Dutch. He also published 'Hugonis Grotii Parallelinus rerum publicarum, libertatis de moribus ingenioque popularum, Atheniensium, Romanorum, Batavorum,' with a translation into Dutch, 3 vols. 8vo., 1801-2, and 'Grotii Epistolae ineditae,' 8vo., 1806. In 1812 he published, in Dutch and French, a poem entitled 'Montmartre,' and in the same year a 'Discourse on the First Travels of Peter the Great, principally in Holland.' 8vo. His last publication was a translation into Dutch of Klopopock's 'Messiah.'

Under Louis Bonaparte, as king of Holland, he was made Director of the Fine Arts and Minister of Public Instruction, and was entitled to the gratitude of his country for the zeal and success with which he prosecuted his functions. Afterwards, when Holland became united to France, he was made a count of the empire and senator by Napoleon. He died August 15, 1812. The Meerman Library was sold by auction in 1824, and produced no less a sum than 131,000 florins.

(Mogr. Univ. tom. xxviii.; Gent. Mag. vol. lxxxvi., p. i, p. 639.)

MEERSCHAUM, a magnesian mineral found in the island of Samos and Negropont (Euboea), in the Archipelago, &c. It is said to be employed as fuller's earth in the Turkey dominions, and in the manufacture of tobacco-pipes.

MEGADHERMA. [Chiroptera, vol. viii., p. 24.]

MEGADERMATA, a name given by Bowdich to a genus of fresh-water Conchifera (Polamophila of Sowerby, Galathe, Lam.).

MÉGADHUTA. [Calidasa.]

MEGALONYX. [Megalitherium.]

MEGALOPA, Dr. Leach's name for a genus of Macururus crustaceans (Macura of Latreille).

The external antennae are setaceous, hardly one-fourth as long as the carapace, and formed of elongated joints; the intermediate ones terminated by two bristle-like appendages, the upper of which is the longest. External jae-leaf, with the two first joints compressed, the second the shortest, and notched at the end for the insertion of the eyes. Anicerior feet equal, in form of disadbley pincers, rather short and stout; four last pair rather shorter, less stout, and terminated by a single nail, which is a little curved. Carapace short, wide, and a little depressed, terminated in front by a pointed rostrum, which is wide at the base, and sometimes inflected. Eys very small, set upon a very short peduncle. Abdomen narrow, extended, linear, composed of seven joints, of which the five intermediate ones are provided with appendages, viz. the four fins with false feet, having their external division very large and ciliated, and the fifth, on each side, with a horizontal blade or lamina, which is oval and ciliated, composing, with the last joint, a sort of fin, differing a little form that of the other Macurura.

MEGALOPA, Macula mutica. This species differs from the others in having the rostrum a little inflected perpendicularly on the carapace and calcified in the middle; also in the absence of a recurved spine on the haunches of all the feet. The shell is truncated posteriorly, and has no point like that of Megalopas. Colour brownish. Locality—Found by M.M. Audouin and Adolphe Brongniart at the mouth of the Loire.

MEGALOPHUS. [Musicaepide.]

MEGALOPOLIS. [Arcadia.]

MEGALOSAURUS, the name assigned by Dr. Buckland and the Rev. W. Conybeare to an extinct genus of Saurians found in the oolite slate at Stonesfield near Woodstock and other localities.

Though no entire skeleton is yet been discovered, the number of bones and teeth collected give sufficient data to enable the observer to pronounce upon the general osseous structure, with almost as great a certainty as would be the result of the examination of the bones of the animal in a perfect and connected state.

The femur, or thigh-bone, and tibia, or leg-bone, are nearly three feet in length severally, so that the entire hind-leg must have been nearly two yards long, and the discovery of a metatarsal bone measuring thirteen inches indicates that the foot was of a corresponding length. From these and other remains, including the vertebrae, teeth, &c., the size of this gigantic saurian has been calculated and its habits ascertained.

'The most important part of the Megalosaurus yet found,' observes Dr. Buckland, in his 'Bridgewater Treatise,' 'consists of a fragment of the lower jaw, containing many teeth.'

Anterior extremity of right lower jaw of Megalosaurus, from Stonesfield, one-fourth natural size. a, View of the inside; b, view of the outside. (Buckland.)

'The form of this jaw shows that the head was terminated by a straight and narrow snout, compressed laterally like that of the Dolphinus Gangeticus.'

Tooth of Megalosaurus, two-thirds natural size. The dotted lines indicate the compressed conical cavity, containing pulp, within the root of the growing tooth. a, Transverse section of the same, showing the manner in which the back and sides are enlarged, and rounded in order to give strength, and the front is brought to a strong and thin cutting edge.

The structure of these teeth, another of which is figured in the article MASTODON, leaves no doubt as to the carnivorous habits of this immense extinct lizard; and the internal structure of the cylindrical and other bones shows that it was a terrestrial animal, though it may have occasionally taken to the water in pursuit of prey, such as Plesiosauri and fishes. Its ordinary food is supposed to have been the smaller reptiles, crocodiles, and tortoises, whose remains occur abundantly in the strata where those of Megalosaurus abound.
was taught, modified to some extent by the doctrines of Socrates. The Megarian philosophers maintained that the greatest Good was always the same and unchangeable. 

They were distinguished in later times by their dialectic subtlety, and by the invention and solution of sophisms; on which account they were called Eristici (ipserustes) and Diadectes ( Gäntzer). (Diog. Laert. ii. 106, iii. 6), where Euclid, one of the oldest of them, resided. (Euclid.) A few of these disciples remained at Megara with Euclid, who was looked upon as the founder of a school of philosophy which is usually known by the name of Megara. In this school the Eleatic philosophy

MEGARICA, one of the political divisions of ancient Greece, in the territory of the Corinthians, from which it was divided from the Corinthian territory on the west by the Oenacian range of mountains, through which there were only two roads from Corinth into Megara; one of these, called the Scironian Pass, which is the steep escarpment of the mountains, and one called the Tropic Gulf, passed by Crommyon (Strabo, p. 391), and along the side of the escarpment was the direct road from Corinth to Athens. This road was made wide enough by the emperor Hadrian for two vehicles abreast (Pausan. i. 48, § 10, but at present it only admits a single vehicle, except in places (Thiersch, De l'Etat Actuel de la Grèce, ii. 32); yet the road on the whole is in good condition. The other road, following the coast of the Corinthian gulf, crossed the Oenacian range at its narrowest part, and led to Pegae, on the Corinthian gulf, and thence to Beozia.

The extreme breadth of Megara, from Pegae to Nisaea on the Corinthian gulf, is reckoned by Strabo at 120 stadia (p. 334); and the area of the city was the subject of an investigation by Mr. Clinton, from Arrowsmith's map, at 750 square miles (Facts Hfill., ii. p. 385), which is about the area of the county of Worcestershire. Megara is a rugged and mountainous country, and contains only one plain of small extent, in which the capital, Megara, is situated.

Civin's opinion Megalosaurus partook of the structure of the crocodile and the monitor. See also Mantell's Geology of Sussex; Cuvier, Osteumus Fossiles; and Geol. Trans. vol. ii. pp. 370-380.

Besides the localities above mentioned we may notice the occurrence of this animal in the solif of Normandy; Forest marlure, Caen; Jura, near Soisethun. (H. von Meyer.)

MEGAPODIDAE. Mr. Swainson's name for a family of the genera, the subgenus Megopodus, and the genera Dicholopus, Prophia, and Crax, with the subgenera Crao, Oraoz, Ortilauda, Peneloe, and Lophpcrass. An account of Dicholopus will be found under the title Carriana; and Prophia is described under that of Agami, with the synonym of Trophis crepusculans, an error for the Linnean name Proprya crepusculans. For a description of Meaurv, see the article. Megopodus and the other genera are treated of under the title Carriana. Lophophorus being the Gaulicus of Cuvier; but thus distinguished subgenerically by Mr. Swainson. From the head to the feet an elevated, pear-shaped, horn-like protuberance. Bill intermediate in shape, between Crax and Ornans Core small. Nostrils basal, oval or round.

Example, Crax gallus.

The genus Oraoz, as restricted by Mr. Swainson, which gives Oraoz erythrمحنches as the type, appears to be the Oraoz Mitu of Civin and others.

MEGARIAN SCHOOL. After the death of Socrates the disciples retired from Megara (Diog. Laert. ii. 106, iii. 6), where Euclid, one of the oldest of them, resided. (Euclid.) A few of these disciples remained at Megara with Euclid, who was looked upon as the founder of a school of philosophy which is usually known by the name of Megara. In this school the Eleatic philosophy...
MEGASPIRA. Mr. Lea's name for a pupiform, terrestrial, testaceous mollusk, remarkable for the length of the spire of its shell, which consists of twenty-three close-set, narrow, gradually increasing whorls, which he thus characterizes: 

**Shell clavate; aperture nearly oval, below rounded; margins reflected, above disjoined; columnella many-folded, below entire, not effuse.**

**Anomia.**

P. C., No. 920.

This genus, which is closely analogous to the genera Bulinus, Pupa, and Auricula, according to Mr. Lea, is founded on a single species, **Megaspira Rachenbergiana**.

**Description.** Shell subhyaluricular, turricled, thickly striate, brownish, with longitudinal reddish-brown dots, having a solid apex; whorls twenty-three, rather flattened; spire obtuse at the apex; columnella with four folds; outer lip reflected.

MEGASPIRA Rachenbergiana. (Lea.)

MEGA'STHENES lived in the time of Seleucus Nic-ator, king of Syria, who sent him on an embassy to Pali-bothra, the capital of Sandracottus, king of the Prasi. The territories of Sandracottus were on the Ganges and the Jumna. Megasthenes stayed in India seven years, and on his return recorded his observations in a work entitled 'Indica.' Of this work, which is unfortunately lost, there are extracts in Strabo, Arrian, and Balian. Though Strabo has on several occasions expressed an unfavourable opinion of the trustworthiness of the author, it is quite certain that the work contained much valuable information which was then entirely new to the Greeks. Megasthenes gave the first accounts of the Brahmins, or Ceylon.

MEGA'STOMA. (Griaux.)

MEGATHERIIDÆ, Megatherioids of Owen, who includes under the family the following genera of extinct Edentata, viz. Megatherium, Megalonyx, Glossothrix, Mylodont, and Sclodictatherium, all of which have as yet been found in America only.

Megatherium. (Cuvier.)

A gigantic extinct mammiferous group, more nearly allied to the Ant-eaters and Sloths than to the Armadillos. The dental formula cannot be definitely stated, because the number of teeth in the lower jaw is not known. The upper jaw, as Mr. Owen has shown, contains five on each side. The order and from the analogy of Sclodictatherium it may be conjecured that Megatherium had only four teeth on each side in the lower jaw. In that case the formula would be

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Cuvier pointed out the skull of this animal as very much resembling that of the Sloths, but observed that the rest of the skeleton bore a relationship partly to the Sloths and partly to the Ant-eaters. The Ant-eaters were for a long time the principal, if not the only source of information with regard to the genus, and as Mr. Clist remarks in his paper, to which we shall presently allude more largely, "that magnificient though imperfect skeleton had remained almost unaltered since the last century altogether unique. " Very few additional specimens, says that able osteologist, "appear to have been sent to Europe, and no other cabinet save the solitary one at Madrid possessed (as far as I am able to learn) a single intelligible fragment which could with certainty be assigned to this great unknown. The zeal and energy of Sir Woodbine Parish have added greatly to the materials for arriving at a just conclusion as to the proper place of this animal in the series; and the history of the Megate-

According to the description of Don Joseph Garriga, Spain possessed considerable parts of at least three different skeletons. The first and most complete is that which is preserved in the royal cabinet at Madrid. This was sent over in 1729, by the Marquis of Loreto, viceroys of Buenos Ayres, with a notice stating that it was found on the banks of the river Luzan, west-south-west of Buenos Ayres. In 1793 a second arrived from Lima, and other portions, probably not very considerable, were possessed by Father Fernando Scio, who had received them as a present from a lady who had come from Paraguay. According to MM. Pander and D'Alton, they were unable in 1818 to find any traces of the Lima specimen, or that which had been lent to Fernando Scio. -


The descripcion del esqueleto de un quadrupèd de muy antiguo y reunâ que se conserva en el real gobernador de las Indias a merito de Madrid; (1769) Vol. XV.-K.
The remains collected by Sir Woodbine Parish were found in the river Salado, which runs through the flat alluvial plains (the Pampas) to the south of the city of Buenos Ayres, after a succession of three unusually dry seasons, which lowered the waters in an extraordinary degree, and exposed part of the pelvis to view, as it stood upright in the bottom of the river. This and other parts, having been carried to Buenos Ayres by the country people, were placed at the disposal of Sir Woodbine Parish by Don Hilaro Sosa, the owner of the property on which the bones were found. A further inquiry was instituted by Sir Woodbine Parish, and, on his application, the governor, Don Manuel Rosas, granted assistance, the result of which was the discovery of the remains of two other skeletons on his excellency’s properties of Las Averias and Villanueva; the one to the north, the other to the south of the Salado, but at no great distance from the place where the first had been found. An immense shell or case was found with the remains discovered on the properties of Don Manuel, portions of which were brought to this country, but most of the bones associated with the shell crumbled to pieces after exposure to the air, and the broken portions preserved had not been sufficiently made out, when Mr. Cliif published his memoir, to enable that zoologist to describe them satisfactorily; but he gives very accurate figures of a portion of the shell.

The cuts here given will convey to the reader more accurately than words the osseous structure of this enormous animal, which, when full grown, must have been more than fourteen feet long including the tail, and upwards of eight feet in height.

The simple outline (from Pander and D’Alton) shows the extent of the skeleton at Madrid. The pale tint expresses the extent of corresponding parts sent to England by Sir Woodbine Parish. The dark tint shows the additional parts, which are deficient in the Madrid skeleton. (Ge-
The thigh-bone was twice the thickness of that of the largest elephant; the fore-foot must have measured more than a yard in length, and more than twelve inches in width, and was terminated by an enormous claw, and the width of the upper part of the tail could be less than two feet. The following comparative measurements, furnished by Mr. Clift, will be found in Sir Woodbine Parish's interesting forthcoming work, where a highly characteristic figure of the skeleton, drawn from the original bones, under Mr. Clift's superintendence, shows the parts which are wanting.

**Elephant. Megatherium.**

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The whole of the structure of this extinct animal is admirably adapted for digging the earth so as to enable it to obtain the succulent roots, which, in all probability, constituted the principal part of its food. The snout of the animal appears to have terminated in a short pro-

**Boscia, which must have borne a great deal of resemblance in its proportions to that of the modern Tapir.**

We have seen that an immense shell or case accompanied the remains discovered to the north and the south of the river Salado; and Dr. Buckland was led to suppose, not without considerable apparent ground for the opinion, that this shell was the armour that protected the Megatherium.

'The size of the Megatherium,' says Dr. Buckland, in his 'Bridgewater Treatise,' 'exceeds that of the existing Edentata, to which it is most nearly allied, in a greater degree than any other fossil animal exceeds its nearest living congener. With the head and shoulders of a Sloth, it combined its immense bulk and strength, and an admixture of the characteristics of the Ant-Eater, the Armadillo, and the Chlamyphorus; it probably also still further resembled the Armadillo and Chlamyphorus, in being cased with a bony coat of armour. Its haunches were more than five feet wide, and its body twelve feet long and about six feet high; its feet were a yard in length, and terminated by most gigantic claws: its tail was probably clad in armour, and much larger than the tail of any other beast among extinct or living terrestrial Mammalia. Thus heavily constructed, and ponderously accoutered, it could neither run, nor leap, nor climb, nor burrow under the ground, and in all its movements must have been necessarily slow; but what need of rapid locomotion to an animal whose occupation of digging roots for food was almost stationary? And what need of speed for flight from foes, to a creature whose giant carcass was encased in an impenetrable cuirass, and who, by a single pat of his paw, or lash of his tail, could, in an instant, have demolished the Coguar or the Crocodile? Secure within the panoply of his bony armour, what was the end which he was destined to encounter this Leviathan of the Pampas? Or in what more powerful creature can we find the cause that has effected the extirpation of his race? His entire frame was an apparatus of colossal mechanism, adapted exactly to the work it had to do; and strong and ponderous, in proportion as that work was heavy, and calculated to be the vehicle of life and enjoyment to a gigantic race of quadrupeds, which, though they have ceased to be counted among the living inhabitants of our planet, have, in their fossil bones, left behind them imperishable monuments of the consummate skill with which they were constructed. Each limb and fragment of a limb forming co-ordinate parts of a well-adjusted and perfect whole; and through all their deviations from the form and proportion of the limbs of other quadrupeds, affording fresh proofs of the infinitely varied and inexhaustible con- trivances of creative wisdom.' Much of this eloquent passage is unsuitable; but Professor Owen has demonstrated most clearly, and, we have reason to believe, to the entire satisfaction of Dr. Buckland himself, that the true shell or case found with the Salado remains did not belong to the Megatherium, whose tegumentary covering seems to have been not unlike that of the Ant-eaters and Sloths, but to a Dasyplodius or Armadillo-like gigantic extinct animal, to which Mr. Owen has assigned the name of Glyptodon, whose hind-foot, like the fore, appears to be expressly modified to form a base to a column destined to support an enormous incumbent weight; whilst in the Megatherium the toes were free to be developed into long and compressed claws, such as form the compensating weapons of defence of the hair-clad Sloths and Ant-eaters. Mr. Owen, in his paper read to the Geological Society of London, entitled 'A description of a tooth and part of the skeleton of the Glyptodon, a large quadruped of the Eocene period, to which the shell or case found with the Salado remains did not belong to the Megatherium' in his 'Memoir on the remains of the Megatherium brought to England by Sir Woodbine Parish,' showed that the portions of tessellated armour described and figured by Weiss (Berlin Trans., 1827) are identical in structure with those brought to England by Sir Woodbine Parish, and that the bones which were found with the armour in both cases are the same in their characters, and therefore that they belonged to animals specifically identical. He next entered upon the inquiry, Had the Megatherium a bhe Megath
weight. In the Megatheria the sacral vertebrae are only four in number, and are not anchylosed, and the spinal processes are comparatively small, not locked together, as in the Armadillos, but separated by intervals as in the Bipedes. In the Edentata, the weight of the cuirass is transferred from the sacrum to the thigh-bones by two points on each side. One of them, the ischium, is anchylosed to the posterior part of the sacrum, the other point is formed by the ilium. In the latter the ilium is represented by a stout blade passing straight from the thigh-joint to abut against the anterior part of the sacrum, where the weight of the shell is greatest, a structure which is wanting in the Megatheria. In no species of Armadillo is the ilium expanded, and it is in the Megatheria that the ilium, combining the shape of that of the Elephant in size, form, and position, and among the Edentata the nearest approach in this portion of the skeleton is to be found among the Sloths and Ant-eaters. The structure of the vertebrae of the Armadillos, with reference to the support of a bony covering, is the remarkable production of a part of the vertebra from above the anterior articular process on each side, in a straight direction upwards, outwards, and forwards, to nearly the level of the true spinous processes. Now these oblique processes, which are developed only in the loricated Edentata, beautifully correspond in form and use with the tie-beam in the architecture of a roof, and are entirely wanting in the Megatheria, the structure of this part of the skeleton is in no way corresponding to that of the character of the vertebrae of the hair-clad Sloths and Ant-eaters. Mr. Owen noticed other supposed adaptations in the skeleton of the Megatheria to a bony covering, as the breadth of the ribs, but the true articular processes of the Sloths and Ant-eaters are much more extensive than those of the Armadillos.

The paper contained a tabular account of the discovery of twelve skeletons of the Megatheria, and in no instance did any portion of bony armour occur with or near the bone. A notice was also given of the remains of a Gephyrion found in the left bank of the Pedernal before its junction with the Salas, an affluent of the Rio Santo, near Montevideo, and preserved in the museum of that town. From the accounts which have been given of these remains, they appear to have been preserved in the same manner as those already described in the paper. An allusion was also made to some portions of bony armour obtained in the Rio Beco, in the Banda Oriental, and similar in structure to the specimen of the Pedernal. One of the portions was named as the Banda Oriental, and presented in its concavity vestiges of cuadra vertebrae very distant from each other.

In conclusion, Mr. Owen observes, that having brought to light evidence of the remains of five species (found in the Rio Beco, Rio Janeiro, Villanueva, Pedernal, and the Banda Oriental), of a large Edentata species undoubtedly covered with armour, and more or less corresponding with the character of the Megatherion, and having established the characters of that genus both dentary and locomotory organs; he trusts at the same time that he has vindicated the opinion of Cuvier with reference to the Megatheria, by proving it to be, by its tegumentary covering as well as its osseous system, more nearly allied to the Ant-eaters and Sloths than to the Armadillos. (Geol. Proc., 1839.)

May we venture a suggestion as to the immediate probable cause of the extinction of these and other gigantic quadrupeds whose remains are found in America? The climate of America, great continent as it is, is not to long continued droughts, sometimes lasting for three years in succession, and bringing destruction to the cattle; and, indeed, the discovery of the remains collected by Sir Woodbine Parkeis was owing to a succession of unusually dry seasons, as we have seen. The upright position of most of these skeletons found in situ, with the ponderous vertebrae, and bones of the pelvis in their natural situation, indicates that the animal must have been hugging in adhesive mud sufficiently firm to uphold the ponderous bones after the decomposition of the soft parts. A long continued drought would naturally have brought these extinct animals from the drained and parched country to the rivers, brindled in the continued dry seasons, to a slender stream running between extensive mud banks, in which these gigantic quadrupeds may have been engulfed in their anxious efforts to reach the water."}

Megalonyx. (Jefferson.)

Under this name Mr. Jefferson, formerly President of the United States, described, from some bones found in cavities west of the Ohio, an extinct mammiferous animal, which he considered to be carnivorous. The body of this animal was of the size of a small fragment of a femur or a humerus, a complete radius, and all broken in two, three claws, and half a dozen other bones of the foot.

From the account above mentioned, and on comparison with analogues bones in the Lion, Mr. Jefferson came to the conclusion that the Megalonyx must have been upwards of five feet in height, that it must have weighed nearly nine hundred pounds, that it was the largest of Ungulate animals, and that it was probably the enemy of the Mastodon of the Ohio, as the Lion is of the Elephant. When once a theory takes possession of the human mind, there is generally no want of materials to confirm it in the imagination of the theorist. Thus Mr. Jefferson appeals to the fanciful story of a feline cannibal, related by ancient historians of the Anglo-Americans as visible on a rock at the mouth of the Kanawha, a branch of the Ohio, which must have been traced by the hands of the Indians from their rudest modes to the Sloths and Ant-eaters, some of those who living, who had heard during the night frightful roarings which terrified the dogs and the horses; and he asks if they do not prove the existence of some great unknown carnivorous species in the interior of America, and that this most unaccountable animal may not have been the Megalonyx?

Dr. Wistar, Professor of Anatomy in the University of Philadelphia, subsequently perceived some analogy between the bones of the fossil foot of Jefferson's animal and similar bones in the Lion, the Sloth, without other aid than Daubenton's description.

Cuvier, who saw at once the true analogies of the animal, and was ridiculed for his opinion by Paujas de St. Fonds, who mistook the clear-sightedness of that great zoologist for the blindness of one who would constrain nature to bend to the factitious classification of an artificial system, obtained casts of the bones indicated by Jefferson from Mr. Peale of Philadelphia, and was afterwards furnished by the Prince von Wrede with casts of the bones of the Sloth belonging to the same cain where Jefferson's specimens were discovered; fortunately one of these was a tooth. With these additional materials Cuvier completed his labours, and satisfactorily showed that the Megalonyx belonged to the Edentata.

Mr. Owen, in his description of his genus Mylodon, says: 'The greater part of Cuvier's chapter on Megalonyx is devoted to the beautiful and justly celebrated reasoning on the ungual phalanges, whereby it is proved to belong not to a gigantic Carnivore of the Lion kind, as Jefferson supposed, but to the less formidable order of Edentate quadrupeds: and Cuvier, in reference to the tooth,—the part on which alone a generic character could have been founded,—merely observed that the tooth of the Megalonyx is more like that of the great Armadillos than it is those of the Sloths. In the last edition of the "Régne Animal," Cuvier introduces the Megatherium and Megalonyx between the Sloths and Armadillos, but not to any other order, between the two genera and without the size of the "Ours," le Megalonyx, est un peu mince." Some systematic naturalists, as Desmarest and Fischer, have therefore supposed the genus, and made the Megalonyx a species of Megatherium, under the name of Megatherium Jeffersoni. The dental characters

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Mr. Darwin states that he was informed by an eye-witness, that during the great earthquake in Baja California, in 1812, at that time the snow being frozen, and the men being exhausted by hunger, they were unable to reach the mud banks, and were in consequence destroyed; and that on the following day, the head, hands, and legs, in short, with the whole of the bones except the tail and one foot, were found on the beach. It is probable, also, that the men were covered by their bony armour complete. There was also found a very small and perfect Megatherion, which must have been only just buried at the mouth of destruction. No mention is made of any traces of bony armour or shell about the Megatherion. In the old animal only one tooth is wanting. It has been suggested that the so-called young Megatherium may possibly be a skeleton of Scutellerum.
of the genus Megatherium are laid down by Fischer, as follows: — 'Dent. prim. et lan. 0 ; molares 4-4-4,' Odontoi, tritores, coronide nunc plana transversa suaeae, nem medio excaevata marginalis prominuit.' That Megalonyx had into the question of the molars, and Megatherium (meaning that number in the Megathere to be correctly stated, which it is not) is here assumed from analogy, for neither Jefferson, Wistar, nor Cuvier, the authorities for Megalonyx quoted by Fischer, — possessed other means of knowing the dentition of that animal than were afforded by the fragment of a single tooth.' (Owen, in Zoology of H. M. S. Beagle.)

The same author (loc. cit.) adds, 'With respect to existing Mammals, most naturalists of the present day seem to be unanimous as to the convenience at least of founding a general or subgeneric distinction on well-marked modifications in the form and structure of the teeth, although they may correspond in number and kind, in proof of which it needs only to peruse the pages of a Systema Mammalium which relate to the distribution of that animal than were afforded by the fragment of a single tooth.' (Owen, in Zoology of H. M. S. Beagle.)

This genus is founded on fragment of a cranium in Mr. Darwin's collection, discovered in the bed of the Guane river in Banda Oriental with the skull of the Toxodon. The fragment includes the parietes of the left side of the cerebral cavity, the corresponding nervous and vascular foramina, the left occipital condyle, a portion of the left pterygoid process, and the base of the articular surface of the lower jaw. No tooth, no locomotive extremity, was present to lend its aid; and yet, upon the slender materials above stated, Professor Owen has been enabled to give generic distinction to the animal to which they belonged, and to fix its place in the animal series satisfactorily.

Professor Owen remarks, that the importance of the articular surface of the lower jaw in the determination of the animal has been very highly appreciated since the relations of the motions of the lower jaw to the kind of life appointed for each animal were pointed out by Cuvier; but he observes that we should be deceived if we were to establish, in conformity with the generalization laid down by Cuvier, our conclusion from this surfact, of the nature of the food of the extinct species under consideration; for the shape of the glenoid cavity is such as to allow the lower jaw free motion in a horizontal plane from right to left, and forwards or backwards, like the movements of a millstone: 'Nevertheless,' continues Owen, 'to affirm it to be most probable that the food of Glossothemium was derived from the animal and not from the vegetable kingdom, and to predict, that when the bones of the extremities shall be discovered, they will prove the Glossothemium to be an ungulate, an ungulate with a fore-foot endowed with the movements of pronation and supination, and armed with claws, adapted to make a breach in the strong walls of the habitations of those insect enemies upon which it had come in greatest evidence, in other parts of the present cranial fragments, that the animal, though large as an ox, was adapted to prey.'

The data on which Professor Owen rests this affirmation are, in the first place, a remarkable cavity situated immediately in the middle of the tympanic bone, of regular hemispherical form and an inch in diameter. The surface of this cavity does not appear to have been covered with articular cartilage, because it is irregularly pitted with many deep impressions, and Mr. Owen concludes therefore that it served to afford a ligamentous attachment to the styloid element of a large os hyoides. In addition to this evidence of the size of the bones of the tongue, there is a more certain indication of the extent of its soft and especially its muscular parts in the magnitude of the foramen for the passage of the stylohyoid nerve, which is measured by Mr. Owen to be more than four times as large as that of Glossothemium. In the other parts of the cranium Mr. Owen finds more decisive evidence of the relationship of this extinct edentate to the genera Myrmecophaga and Muntia.

The question, Had the Glossothemium teeth? is answered by the Professor in the affirmative, from the rugged surface of the temporal fossa indicating an extensive temporal muscle; from the well-defined boundary, formed by

*Simp and Martius, 'Relief in Brazil', 1864, p. 5.
a slightly elevated bony ridge, extending to near the sagitta, suture; the size of the zygomatic portion of the temporal bone, and the remains of the oblique suture by which it was articulated to the malar bone; and he is of opinion that they will probably be found to be molar teeth of a simple structure, as in the Orycteropus.

Here is evidence of the existence of an at male. This bone is wanting in the Pangolins; in the true Ant-eaters it does not reach the zygomatic process of the temporal bone. From this evidence of the completion of the zygomatic arch, the Professor concludes that Glossothierium was more nearly allied to the Armadillos and Orycteropus; and from the form and loose condition of the tympanic bone, through the care and attention of Mr. Darwin, was preserved in situ, that the affinity of the animal was closer to Orycteropus than to the Armadillos: but the tympanic bone of Orycteropus differs from that of Glossothierium in forming parts articulated to the lower jaws whose long axis vertical, and in sending outwards from its anterior part a convex eminence, which terminates in a point directed downwards and forwards: in the distance from the origin of the zygoma to the occipital plane, which is relatively greater in Glossothierium, than in Orycteropus, the lower jaw is more similar to Myrmecophaga and Manis.

The internal surface of the cranial fragment shows that in Glossothierium, as in other Brusa, the cerebellum must have been almost entirely exposed behind the cerebrum, that the latter was of small relative size, not exceeding that of the Ass; and that it was chiefly remarkable, as in Orycteropus, the Ant-eater, and Armadillo, for the great development of the olfactory ganglia.

Such are the leading points on which the establishment of this extinct genus is placed. Our limits do not admit of our following out the interesting details which confirm the view taken by Mr. Owen, and which the reader will find in his 'Fossil Mammalia,' as part of the 'Zoology of the Voyage of Her Majesty's Ship Beagle,' under the command of Captain Fitzroy, R. N., edited and superintended by Mr. Darwin, and published with the approval of Her Majesty's Treasury; but we think it advisable, with reference to the succeeding fossil species described by the Professor, and here noticed, to give the concluding paragraph in his paper on Glossothierium.

'A question,' says Professor Owen, 'may arise after perusing the preceding evidence, upon which the present fossil is referred to a great Edentate species nearly allied to the Orycteropus, or therian in the lower jaws, subsequently to be described, and, like the inarticulate, to that of the Orycteropus or Didymopithecus families of Edentata, may not have belonged to the same species as does the present mutilated cranium. I can only answer that these relative size were discovered by Mr. Darwin in a different and very remote locality: that no fragments or teeth referrible to them were found associated with the present fossil; and that, as it would be therefore impossible to determine from the evidence we have now before us which of the two lower jaws should be associated with Glossothierium: and as both may, with equal, if not greater probability, belong to a totally distinct genus, it appears to me to be preferable, both in regard to the advancement of our knowledge of these most interesting Edentata of an ancient world, as well as for the convenience of their description, to assign to them, for the present, distinct generic appellations.'

Myodon. (Owen.)

A genus of Edentate Megatherioids, founded on some fossil remains described by Dr. Harlan in his 'Medical and Physical Researches,' and referred by him to Megatherius, and on a mutilated lower jaw and teeth discovered by Mr. Darwin among the many interesting novelties which have been the result of that zealous naturalist's researches in the southern division of America.

The fossil last alluded to was found in a bed of partly consolidated gravel at the base of the volcanic rocks of Punta Alta, at Bahia Blanca, in Northern Patagonia, and consists of the lower jaw, with the series of teeth entire on both sides: the extremity of the symphysis, the coronoid and condyloid processes, and the angular process of the left ramus, are wanting.

The teeth are implanted in very deep sockets, and about one-sixth only of the last molar projects above the alveolus; but the proportion of the exposed part increases gradually in the anterior teeth. This and the relative distance of the teeth will be seen in the following figure.

The implanted part of each tooth is simple, of the same size and form as the projecting crown, and with a large conical cavity at the base, for the persistent pulp, and indicating that their growth, during life, was perpetual.
which expanded slightly to the symphotic region, and thence contracted gradually in all its dimensions to the anterior extremity.

"The Cape Ant-eater (Orycteropus) [Aard-vark]," says Professor Owen, "of all Edentata, most nearly resembles the present fossil in the form of its cranium, and next in this comparison the great Armadillo (Dasypus Gigas, Cuv.) may be cited: on the supposition therefore that the correspondence with the above existing Edentals observable in the parts of the cranium which have come out through those which are defective, the length of skull of the Scelidotherium must have been not less than two feet. The cranium is singularly small and slender in proportion to the rest of the skeleton, especially the bulky pelvis and femur, of which bones the latter has a length of seventeen inches, and a breadth of not less than nine inches; the astragals again exceeds in bulk that of the largest Hippopotamus or Rhinoceros; yet the condition of the epiphyseal extremities of the long bones proves the present fossils to have belonged to an immature animal. Hence, although the Scelidotherium, like most other Edentals, was of low stature, and, like the Megatherium, presented a disproportionate development of the hinder parts, it is probable that, bulk for bulk, it was, when alive, the largest existing pachydermn mammal.

Two species, Mylopond Harlani, founded on the fossil described by Dr. Harlan, and Mylopond Darwinii, on that discovered by Mr. Darwin, are recorded by Professor Owen; and gives the following admeasurements of the lower jaw of these species:

<table>
<thead>
<tr>
<th>Species</th>
<th>Inches</th>
<th>Lines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length (as far complete)</td>
<td>17</td>
<td>6</td>
</tr>
<tr>
<td>Extreme width, from the outside of one ramus to that of the other</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Depth of each ramus</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Length of alveolar series</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>From first molar to broken end of symphysis</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Breadth of symphysis</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Longitudinal extent of symphysis</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Circumference of narrowest part of each ramus</td>
<td>5</td>
<td>9</td>
</tr>
</tbody>
</table>

He further observes that the teeth and bones of Mylopond Darwinii, above described, exhibit all the appearances and conditions of those of a full-grown animal, and that they present a marked difference of size as compared with those of Mylopond Harlani, which must have been a much larger animal, for if the lower jaw of the latter species bears the same proportion to its teeth as that of Mylopond Darwinii, it must be about two feet in length. (Zoology of H. S. Beagle.)

Scelidotherium. (Owen.)

A large extinct edentate mammal, allied to Megatherium and Orycteropus.

The remains on which this genus is founded include the cranium, which is nearly entire, with the teeth, and part of the mandibles; the vertebrae, eight dorsal and five sacral vertebrae, both scapular, the left humerus, radius and ulna, two carpal bones, and an unequal phalanx; the two femora, the proximal extremities of the left tibia and fibula, and the left astragalus.

These bones were discovered by Mr. Darwin at Punta Alta in Northern Patagonia, and in the same bed of partly consolidated gravel as that wherein the lower jaws of Toxodon and Mylopond were imbedded. All the parts were discovered in their natural relative position, indicating, as Dr. Owen observes, that the subtilior formation in which they had been originally deposited had been but little disturbed. This beach is covered at spring-tides, and many portions of the skeleton were encrusted with Pliotre: small marine shells were lodged within the crevices of the rocks.

Sufficient of the cranium remains to indicate that its general form resembled an elongated, slender, subcompressed cone, beginning behind by a flattened vertical base

Remains of skull of Scelidotherium. (Owen.) Reduced.
alluded to demonstrate, in like manner, that the laws of acoustics have not changed, and that the extinct giants of a former race of quadrupeds were endowed with the same exquisite mechanism for appreciating the vibrations of sound as their existing congeners enjoy at the present day. 

'The brain,' says Mr. Owen, 'being regulated in its development by laws analogous to those which govern the early perfection of the organ of hearing, appears to have been relatively larger in the Scleridotherium than in the Glissotherium: it was certainly relatively longer; the fractured cranium gives us six inches of the antero-posterior diameter of the brain, but the anatomy of the Orycteropus would lead to the inference that it extended further into the part which is broken away. The greatest transverse diameter of the cranial cavity is four inches eight lines; their dimensions however are sufficient to show that the brain was of very small relative size in the Scleridotherium; and, both in this respect and in the relative position of its principal masses, the brain of the extinct Edentata closely accords with the general character of this organ in the existing species of the same order. We perceive by the obste rise continued obliquely upwards from above the upper edge of the petrous bone, that the cerebellum has been situated wholly behind the cerebrum; we learn also, from the same structure of the enduring parts, that these perishable masses were not divided, as in the Manis, by a bony septum, but by a membranous septum, in the Glissotherium and Armadillo in the Orycteropus, as has been before remarked, there is a strong, sharp, bony ridge extending into each side of the tentorium. The vertical diameter of the cerebellum and medulla oblongata equals that of the cerebrum, and is two inches three lines: the transverse diameter of the cerebellum was about three inches nine lines; its antero-posterior extent about one inch and a half. The sculpturing of the internal surface of the cranial cavity bespeaks the high vascularity of the soft parts which it contained, and there are evident indications that the upper and lateral surfaces of the brain had been disposed in a few simple parallel longitudinal convolutions. The two anterior conoidal foramina have the same relative position as the single corresponding foramen in the Glissotherium, Orycteropus, and Armadillo; and the inner surface of the skull slopes outward from these foramina to the inner margin of the occipital condyle. 

The size of the orbit is relatively smaller than in the Orycteropus, and still less than in the Ant-eaters. Here however, observes Mr. Owen, 'we have merely an exemplification of the general law which regulates the relative size of the eye to the body in the Mammalia. The malar bone does not extend so far forwards in front of the orbit as in either the Orycteropus or Armadillo; in the inclination however with which the sides of the face converge forwards from the orbits, the Scleridotherium holds an intermediate place between the Armadillos and Orycteropus. 

The dental formula of Scleridotherium appears to have been:

Incisors 0 0 0 0 / Canines 0 0 / Molars 2 2 3 1 1 = 18.

Though the teeth of Mylodon and Scleridotherium have a close analogy to those of existing small Insectivorous Edentals, there is nothing in their structure to militate against the presumption that these extinct genera were fed on succulent plants, such as cabbage-palms, or on farinaceous vegetables, such as large ferns. Their teeth are well adapted to chew vegetable tissues of moderate firmness. (Zoology of H. M. S. Beagle.)
MEG

M. Lund distinguishes two species, present this particularity, that their zygomatic arch is furnished with a descending branch, a character regarded till now as exclusively proper to an ox. Fragments of these skeletons have already been described by MM. Weismann and D’Alton of Berlin.

M. Lund has found fragments belonging to a genus approaching Hoplothorus, and to which he assigns the name of Parachytherium. Its proportions were still more massive and its stature taller.

Family of Bradydonta.

M. Lund is thus conducted to the family of the Sloths, which he places under the order of "pachyderms" in these circumstances: a very important part, whether the number and variety of their forms, or the great size which the species attained, are considered.

The first genus which he notices is Megalonyx. It is connected by the Armadillidium (Tatous) by the osseous plates which protected a part of its body; but these plates, although of excessive size, far from forming a continuous curvus as in the Tatous, were separated from each other by great intervals. The Megalonyx exhibits the greatest affinity for the Phalangeridae, and in the articulation of the hind feet, according to M. Lund, the articulation is effected in the ordinary manner, and it is the carpal surface of this last bone, which by its anomalous configuration, caused the termination of all the other bones of the foot, to the number of five above and four below, to be deprived of roots as in the animals of the order Edentata; in that they differ from those of Megatherium, which are described as having two roots.

* But see above, pp. 47, 60.

MEI

MeBAHOM, MARC, a member of a numerous German family, who were distinguished in the seventeenth century for their classical knowledge and scientific attainments. He was born at Tonnaingen, in the duchy of Schleswig, about the year 1630, and died at Utrecht about the year 1711. Dr. Hutton gives 1590 as the year of his birth, and 1668 as that of his death, which are no doubt incorrect. Marc Meibom was patronised by Christina, queen of Sweden, to which the dedicated a collection of seven Greek authors upon music. Amst., 1620, 4to. He was subsequently appointed to a professorship in the university of Upsal, by Frederick III, to whom he acted in the capacity of librarian. He quitte Upsal for the professorship of Hebrew-literate in the University of Utrecht; but the latter library remained but a short time. In 1674 he came to England, where he prepared the publication of a new edition of the Hebrew Bible, asserting that the edition then in use was full of errors; his translation was approved and approved by the learned. Among his published works, a list of which will be found in the Biographie Universelle, there is a curious 'Dialogue on Proportion,' wherein he introduces the whole of the antient geometricals, Euclid, Ait, Apollonius, Pappus, and others; and, in 1670, Meibom in this work respecting the doctrine of proportion were shown to be erroneous by Lingis, and by Dr. Wallis in a tract printed in the first volume of his works. (Hut- ton's Dict. ; and Biograph. Univ.)

MELICYPHOR (WEE. [ETC.]

MEINIAN, River. [Siam],

MEININGEN, or MEININGEN, the capital of the duchy of Saxe-Meiningen-Hildburghausen, is situated in 50° 59' N. lat. and 10° 24' E. long.; in a pleasant valley on the banks of the river Fuld, which here divides several arms. It is a well-built town, with broad, straight, and paved streets; the ducal palace, called the Elisabethenburg, is a handsome building; the central part is 500 feet in length, and is adorned with 24,000 volumes, a gallery of paintings, a collection of engravings, and the archives of Henneberg. In a separate building in the garden there is a cabinet of medals and a collection of natural history. The other principal buildings are the house of the assembly of the Estates, the townhall, with a good library, the four churches, an infirmary, and a theatre. There are a lycem, a gymnasium, a seminary for country schoolmasters, and several schools. The environs are very agreeable. The inhabitants, now 6000 in number, have manufactures of black grape, yarn, calico, and woollens of various descriptions, in which they carry on a considerable trade.

MEISSEN, one of the circles of the kingdom of Saxony, is a part of the antient Margraviate of the same name. It lies on both sides of the river Elbe, between 50° 49' and 51° 26' N. lat., and 12° 45' and 14° 17' E. long. Its area is 2352 square miles, and its population 379,378 souls. This circle is one of the most fertile and best cultivated parts of the kingdom; it produces corn, grain, and in some parts wine. It likewise contains the principal manufactories in Saxony of woollen, linen, and cotton. Dresden, the capital of the kingdom, is in this circle, which is peculiarly distinguished by its natural beauties, such as the mountainous country known by the name of the Saxo- Switzerland, the basaltic groups of Stolpen, and the romantic envisions of Dresden, Pillnitz, and Meissen. (DRESDEN.)

MEISSEN, the second town in the circle, in the same name in the kingdom of Saxony, is situated on the river Saxon on 15° 20' E. lat. and 51° 3' N. lat., and between hills on the left bank of the Elbe, over which there
is a covered bridge, supposed to have been originally built in the eleventh century; this bridge was destroyed in 1547, 1757, and in 1813, but has since been rebuilt. It is one of the oldest bridges in the country, having been founded in 922 (as some say, 926), by king Henry I., as a bulwark of his German settlements against the conquered Slavonians. His son, Otto I., founded the cathedral, and established the prince-bishopric of which the town continued to be the seat till the Reformation. There are now but few remains of the fortifications which were begun by Henry I. The cathedral, a masterpiece of antient German architecture, has a tower surmounted with a spire 60 feet high, composed of being 465 feet from the ground. It is rich in its proportions. Adjoining it is the prince's chapel, founded in 1425, by Frederick the First, elector of Saxony, of the house of Meissen, for the hereditary vault of his family, in which there is a bronze monument of the founder. The town of Albrechtsburg, near the cathedral, was formerly the common residence of the margraves, burggraves, and bishops of Meissen; but the margraves transferred their residence to Dresden in the thirteenth century. The palace was almost entirely rebuilt in 1449. It now contained the celebrated porcelain manufactory, the productions of which rival or surpass those of China and Japan in hardness, durability, the beauty of the forms, and the taste of the painting. The former convent of St. Afra, which is joined by a stone bridge to the palace, contains the chapel in which the palace stands, contains the prince's school, in which there are 120 scholars, most of whom live free of all expense. There are various flourishing manufactories, but the chief source of profit is the making of bone. (Reinhard, Die Städte Massen, &c.; Uranus, Die Domkirche zu Meissen.)

MEISSNER, AUGUSTUS GOTTLIB, a popular and voluminous German writer of the last century, was born at Bautzen in Upper Silesia, November 4, 1753. In 1783 he was professor of mathematics at the university of Prague, and in 1803 director of the high school at Fulda, where he died, February 20, 1807. He wrote several dramatic pieces, including some translations from Molière and Dumas; he was a representative in German Parliament, and was a close friend of Goethe; but it is his 'Skizzen' that rendered him a favourite with the public. These sketches, extending to fourteen sammlungen, or series (the first of which appeared in 1778, the last in 1793), consist of essays, tales, narratives, anecdotes, dialogues, &c., and recommend themselves by their agreeable liveliness, shrewdness, and pleasantness. Although not entirely free from blanishments of style, they have the merit of being the most successful attempts in the lighter walks of literature which German literature possesses. Many of them were translated or imitated in French, Danish, and Dutch, and one or two were translated by Thompson in his ‘German Miscel- lany.’

His ‘Tales and Dialogues’ (1781-9) may be considered as a continuation of his sketches, being similar in plan. His ‘Alcibades,’ ‘Massaniello,’ ‘Bianca Capello,’ and ‘Spar- tacus,’ are productions of greater length (the first mentioned being in four volumes), and are specimens of the historical and biographical romance. With the exception of the last, they have all been translated into French. Among the above and a variety of other works, Meissner contributed a great number of literary and historical articles to different periodicals.

MEKINÉZ. [Morocco.]

MEJERDA, or BA‘GRÁDAS, is a river in Northern Africa, and probably the largest river of that continent which extends into the Mediterranean. It is rich in its tributaries and 36° N. lat. and 7° E. long. constitute the most easterly of the elevated ranges of Mount Atlas; after watering a rich and populous country, which extends east of those ranges to 23° 30' N. lat., and form the Wady Sbat, the principal branch of the Mejerda river. In its course, which is nearly due north, it separates Algers from Tunisia, until it reaches 36° 10' N. lat., where it is joined by the Wady Hamza from the west, and takes the name of Mejerda. Up to this junction its course exceeds 600 miles, and from this point it runs about 60 miles easterward through a fertile country. It then turns north-north-east, and continues this course until it falls into an inlet of the bay of Tunis near Cape Farina, after a course of more than 260 miles. The Mejerda does not appear to be navigated, but it is used to irrigate the fields in the lower part of its course, where it flows through a wide and level valley. It overflows and fertilises the adjacent country; but these inundations do not, as in the Nile, take place in the middle of summer, but in the spring. They are the effect of the winter and spring rains, and of the melting of snow on the high mountains which surround its upper branches.

MEKRAIN [PARRIA.]

MELA, POMPONÍUS, a Roman writer on geography. He is thought by some critics to have been the same person as the supposed author of a work on the conspiracy against Nero, and who put an end to his own life (Tac., Ann. xvi. 17; Plin., N. H. xix. 61); but this opinion is only founded on the similarity of the names. It is probable, from a passage in which Mela speaks of the emperor Claudius; and it is evident from many passages in his work that he could not have lived before the time of Augustus (iii. 1, 'turris Augusti titulos memorabilius;') compare iii. 2, &c.). It appears from a passage in his own work (iii. 3, 4), that if his work was so widely diffused as MESS. S. see, in this passage, that it is difficult to determine the right reading; many critics think that we ought to read Mellaria.

Mela's work is entitled in most MSS., ‘De Situ Orbis.’ It is divided into five books, and contains a very brief description of the various parts of the world. In the first book, after giving a short account of the great divisions of the earth, Mela commences with Mauritania (part of Morocco), and following generally the coast, he describes successively Nubia, Egypt, Syria, Phoenicia, Cilicia, Pamphylia, Lydia, Asia, Aegyptus, and the countries on the Euxine and the Mesopotamia as far as the Phriphian mountains. In the second book he commences again at the mouth of the Tanais (Don), and describes the countries in Europe on the western side of Gaul, and afterwards describes Germany and the central parts of Europe and Asia as far as the Caspian. After mentioning some of the islands in the ocean, he next describes India and the maritime coast of Persia, Persis, and Arabia, and concludes the description of the world in the third book. Mela appears to have been a mere compiler, and to have had no scientific knowledge of his subject. If we consider him later than Strabo, it does not appear from Mela's work that geography had made any progress in the meantime. Luke Strabo considers the earth as enclosed by four great inlets of the ocean, of which the Mediterranean, the Red Sea, and the Persian Gulf were three; the fourth was the Caspian Sea. The singular error as to the Caspian Sea is remarkable when we consider that Herodotus knew the Caspian to be a lake (Herod., i. 252; Strabo, p. 121; Mela, i. 3; iii. 6)

The best editions of Mela are by Gronovius, Leyden, 1685, frequently reprinted; by Tischbeck, 7 vols. 8vo., 1825; by Lapie, of the Lincei, 1835. It was translated into English, by Arthur Golding, Lond., 1562 and 1590, and into Italian, by Porcachini, Ven., 1575, and into French, by Fradin, 3 vols. 8vo., Paris, 1804.

MÉLAIN, a name which has been given to the colouring matter of the red dye of the madder plant. It is prepared by evaporating the ink to dryness and boiling the residue successively in water, alcohol, hydrochloric acid, more water, and a little carbonate of ammonia. Dr. Prout found 19 parts of the dry residue of the ink of the cuttlefish C. cuttlefish, 19:40; carbonate of magnesia, 7 ; substance analogous to mucous; 18:4; various salts, 216.

MELALEUCA CAJEPUTI (Roxb.), the Melaleuca

MINOR (Smith), a native of the Molucca islands, yields the oil termed cajeput. It is obtained by distillation of the leaves and branches, which are collected the night before they are subjected to this process. It is very limpid, pellucid, and of a light or yellowish green colour. Specific gravity, 0.927; it boils at 146° (Hiadamur). It is placed among the penetrating odours; the taste is acridly aromatic, leaving a sense of coldness in the mouth. Its chemical composition is, carbon 78.12, hydrogen 11.49, oxygen 10.38. It seems to consist of two distinct oils: one transparent as water, of specific gravity 0.887; the second dark green, of specific gravity 0.926. Unrectified oil reddens litmus paper, but rectified does not. It does not detone with iodine, nor does it form an artificial camphor with hydrochloric acid gas, but has its colour much changed by that gas. It never deposits a stearin. Some examples of cajeput oil contain copper, which may be detected by different tests; an artificial oil is also sometimes vended, but it is not difficult to detect the fraud.

In its action on the human frame cajeput participates in the properties of other volatile oils, and is rubefacient externally, stimulant and antispasmodic when taken internally. Mixed with other ingredients it has proved a useful application to the joints in rheumatism and similar affections, while a few drops of cajeput oil on the external lip will ward off slight attacks of hysteria or epilepsy. It by no means realised the expectations entertained of it as a remedy in spasmodic cholera.

MELANIPUS (Zoology). De Montfort's name for a genus of turbaned testaceans (Conoidea or Conocephalus of Lamarck) placed by Cuvier next to the great genus Auricula, and by M. de Blainville and M. Range under the family Auriculacea. De Blainville arranges both Melanipus (Conoidea) and Tornatella under Pedipes (Adanson).

This genus has, like Auricula, plates on the column or pillar of the shell, but the external lip has no roll or bourrelet, and is finely striated internally. The general contour of the shell is that of a cone, of which the spire forms the summit. The species are Melanipus coniformis, a little enlarged.

MELANCeONTH, PHILIP (or MELANCTHON, as he himself was most accustomed to write the name, according to Christ. Saxius, 'Onomast.' iii. 589), was born in the small town of Breiten or Breither, in the Palatinate of the Rhine, or Lower Palatinate, as it is called in both languages. They still show at Breiten, or did a few years ago, the house in which his parents lived. His father was George Schwarzerde, or Schwarzerdt, and is called by Melchior Adam, the earliest authority, Magister Armorum, a description which has given rise to some controversy. It appears that whatever was the original condition of Melanchthon's father, he was a man of remarkable ingenuity in his profession, and had worked his way up to a situation of some distinction, that of principal engineer to the elector, before the birth of his son. (See Bayle, Dict. Crit., 2nd edit., ii. 2019, and the authorities there quoted.) According to Joachim Camerarius (in Vit. Phil. Melan.) he was a native of Heidelberg, and came to take up his residence at Breiten upon marrying the daughter of John Reuterus, a person who had been mayor of that town. Reuterus, who lived till his death, was eleven years older than the credit of having been the chief superintendent of his earliest training. On the death of his grandfather, which was followed within a fortnight by that of his father, he was sent to the college of Freiburg, where the remarkable progress he had already made in his studies was continued at an answerable or an accelerated rate. (See a short notice of the early life of Melanchthon in Baille's 'Ensaes Clnbres,' pp. 42, 43.)

At Freiburg he was lodged in the house of a sister of the celebrated Greek scholar John Reuchlin, who was his relative, and it was from Reuchlin, who had trans- lated his own Teutonic surname into the Greek formation Capuio, on the supposition of its connection with Rauch (smoke), that the young Schwarzerde, a compound, meaning, in English, 'black earth,' received the more melodious Gregoric appellation of Melanochthon (quasi melaochar, 'black'). He intended to signify the same thing; by which alone he is now known.

After spending about two years at Pforta, Melanochthon was removed in 1509 to the university of Heidelberg, which however he quitted in 1512 for that of Tübingen, where he remained till 1515. He was a friend of Reuchlin, who in 1518 appointed, by the elector Frederick of Saxony, professor of Greek in the newly established university of Wittenberg. This situation he held so long as he lived. It was at Wittenberg that Melanochthon became acquainted with Luther, then occupying the chair of theology in that university. In his young colleague the great reformer found, along with a ready disposition to imitate his opinions in religion, a pietist as sincere as his own, and an erudition greatly superior; while, if Melanochthon wanted the fiery energy and boldness, and the large heart of Luther, he was free also from some of the defects apt to attend upon such endowments of strength and passion, and, indeed, the calmness of the reformer, and grave and studious character of nature, was formed both to temper the impetuosity of his friend, and to win admittance for their common views into minds of a certain class, and that by no means the lowest, which all the powers of the other might have assailed in vain.

Thus attached by the characteristics in which they were contrasted, as well as by those in which they resembled each other, they soon became the most intimate of associates and supporters of each other. The fellowship of these two was the most distinguished name in the history of the Reformation in Germany; and the remainder of his biography is chiefly the detail of his various labours in the promotion of that great cause. In 1519 he accompanied Luther to Leipzig, to hold a disputation on the divine origination and papal authority with Ecius, or Eckius, one of the chiefest of the Catholic champions of that age. For some years after this he was actively employed, not only in writing books in defence of the reformed doctrines, but in founding schools and colleges, in reviving churches, and in other services of the same kind, undertaken at the command of the elector.

In 1536 he was appointed by the general body of the reformers to draw up what was to be the basis and fundamental Confession, or exposition of their opinions, which was presented to the emperor at the diet held at Augsburg in March that year. Both Francis I. of France, and Henry VIII. of England, were desirous of obtaining the assistance of Melanchthon in their religious reforms, but circumstances interfered to prevent him from visiting either country. In 1540 and 1541 he maintained another great disputation with Ecius, which was begun at Worms, and afterwards transferred to Ratisbon, where it was carried on before the diet, the emperor presiding in person. After the death of Luther, Melanchthon became involved in a bitter controversy with the more ardent spirits of his party, in consequence of his aversion to extreme courses, and especially the timidity he was accused of showing in his approval of the system of compromise between the two religions issued by the emperor in 1548, and afterwards known by the name of the Interim, an approval in which, whether the circumstance is to be held honourable to him or the reverse, it must be admitted that he stood neither in the company of distinguished men of both sides. He died at Wittenberg, 19th April, 1560, leaving two sons and two daughters by his wife, the daughter of a burgomaster of that town, whom he had married in 1526, and who died in 1557. His numerous works, consisting of theological treatises, and translations of several of the Greek and Latin classics, Latin poems, and some historical and philosophical writings, were published in a collected form in five vol. fol., at Basle, in 1544, and in four Prols. fol., at Wittenberg, in 1564, again in 1560, and again in 1601. Melanchthon principally contributed to the diffusion of the Aristotelian philosophy in Germany, both by his teaching and his writings, among which were his 'Elements of Logio and Ethics.' 'Aristot. x, p. 336.'
lized Gastropoda, placed by Lamarck in his family **Melanismia**; by M. de Blainville in his family **Ellipsostomata**; by Cuvier in his order **Pectinibranchia**, between the genera **Helicina** and **Rissae**; and by M. Rang under the order last mentioned, and in the first family of it (**Turbinoidea** of De Férussac), between the subgenera **Palaclidina** and **Rissae**.

**Generic Character.**—**Animal** elongated, with a foot which is ordinarily short and not thick; head proloculi-form, subconical, truncated, and terminated by a buccal slit which is small and longitudinal; one pair of tentacles elongated, filiform, carrying the eyes on the external side, sometimes near the base, sometimes towards one-fourth of their length; mantle open, with festooned edges; **operculum** horny, elongated, and narrow, with an apical and pulmonary summit. (Deshayes.)

**Shell** with an epidermis, of an oval oblong, a pointed spire, which is often elongated or turriculated, and an oval aperture which is widened anteriorly, and has a very sharp edge.

**Geographical Distribution of the Genus.**—The rivers of warm climates generally, and of Asia especially. Species are also recorded from Africa and North and South America. Mr. Conrad has described several new species from the rivers of Alabama.

**Animal and Shell of Melania (Pirenia) aurita.**

**Fossil Melanision.**

M. Deshayes, in his Tables (Lyell, 1833), makes the number of living species thirty-four, and the number of fossil (tertiary) species twenty-five. The species recorded as both living and fossil (tertiary) are, **Melanision inquisitor, inflexo, Cambessedesii**, and a new species. The habitations allotted to the living species of **inquisitor, inflexo, Cambessedes** and the new species, are the Philippine Isles, the Mediterranean, and the lakes of Como and Geneva. **Melanision lactea, mitida, and costellata**, are noticed as fossil species found in more than one tertiary formation. In the last edition of Lamarck (1838) the number of recent species is thirty-six, and of these **Melanision inquisitor** only is noted as occurring in a fossil state. The number of fossil species recorded in this edition is eight, and of these M. Deshayes notes the species **costellata, marginita, and mitida**, as not being **Melanision**, M. mitida having all the characteristics of the genus **Eulima**. The other two M. Deshayes keeps provisionally among the **Melanision**. **Melanismia semipuncata**, another of the eight, he conceives to be a variety of **M. lactea**, and is of opinion that it should be expunged from the catalogue.

Dr. Mantell records two species (**eucata** and **costellata**) in the blue clay of Brickkilnham. Professor Phillips notes a **Melanision** in the Speeton clay, and two (**M. Heddonstonensis** and **stratiata**) in the coralline oolite, **M. Heddonstonensis** and **vitata** in the corrobals, and **M. Heddonstonensis** and **stratiata** in the Bath oolite. In the table at the end of his work (Geology of Yorkshire) he records **Melanision stratiata** in the coralline and Bath oolite, **Heddonstonensis** in the coralline oolite, corrobals, and inferior oolite, **lineata** in the inferior oolite, and **vitata** in the coralline oolite and corrobals. Dr. Fitton records **Melanision Heddonstonensis** in the Oxford oolite (Dorset and Oxford).

**Melanision, Lamarck’s name for a family of fluvial, testaceous, operecdulated, breathing water only, and belonging to the order **Tarchelipodida**. The family consists of the genera **Melanision, Melanopsis, and Pirenia,** according to Lamarck, and Mr. G. B. Sowerby, Jun. (Conchological Manual) suggests that to these may be added **Ancusella** and **Parasthenia**. M. Deshayes, in the last edition of Lamarck, adds the genera **Eulima** and **Rissoea** to **Melanision, Melanopsis, and Pirenia**, the latter of which, it seems, should be expunged.

**Melanopsis**, a genus of fresh-water, testaceous, turbinated mollusks, to which Lamarck assigns a position among his family of **Melanision**. M. de Blainville places it in his family **Ellipsostomata**, between **Cerithidea** and **Pirenia**; and M. Rang, who includes it in the genus **Pirenia**, between **Scutaria** and **Planaxis**.

The genus **Melanopsis** was established by M. de Férussac, and much difference of opinion appears to have existed among all observers as to its proper place in the series. M. Deshayes, in the last edition of Lamarck, gives it as his opinion that it should be arranged in the family of **Melanision**; and he observes that if one considers the zoological and conchological characters of the two genera **Melanopsis** and **Melanision**, they coincide so closely that soon arises. He remarks that M. de Férussac gave, in the first volume of the ‘Memoirs of the Society of Natural History of Paris,’ an interesting account of the animal of the **Melanopsis**, which he had observed in Spain in the neighbourhood of Seville and Valencia, and that M. Quoy has since made known the animal of the **Pirenia terebrae** of Lamarck; so that the means are now at hand for comparing with exactness the three principal types of the family of
Melanopsis, and of observing the analogy of their zoological characters.

If,' continues M. Deshayes, 'we have before us a great number of species of Melanopsis and Melanopsidees, living as fossils, resting on the bottom with the shells of other species, and it is a phenomenon entirely similar to that which we have pointed out with relation to the genera Bulimus and Achatina; that is to say, that we have seen the columnar truncation established by nearly insensible degrees from the most uncertain commencement to a notch as deep as that which marks the Buccina. If, in relying on the identity of the organization of the Bulimus and Achatina, we have been able to reduce almost to nothing the value of the character of the columnar truncation, we are authorised to employ here the same means for demonstrating the little importance which the truncation of the columnella in the Melanopsidees ought to have in the eyes of zoologists as a ground for separating them from the Melanopsis. Already we have explained ourselves as to the value of the genus Pirena, and have shown that it was composed of fossil shells in a heterogeneous manner: on one side we find true Melanopsis, and on the other singular shells, approximating in their characters to certain Cerithia which Linnæus comprised among his Strombii. On approximating these species, we have all the characters of the genus Melanopsis, and that they do not in reality differ from them, except by a notch in the right lip, which notch occupies in these species the place of the posterior gutter in the beeciform Melanopsidees. M. de Férauss clearly points out the relation between the Melanopsidees and joined them to that group, leaving in the genus Pirena only those which we actually comprise among the Melanopsidees. Thus dismembered, the genus Pirena should be expunged from the system.

Geographical Distribution of the Genus.—M. Deshayes observes that the Melanopsidees inhabit the fresh waters of the south of Europe, and particularly those in the neighbourhood of the Mediterranean; and that they show themselves abundantly in a fossil state in the greater part of the tertiary beds of Europe. He remarks that M. de Férauss has noticed that among the fossil species in our temperate countries there are some analogous to those which live in such warmer regions,—an interesting fact, from which he has been led to conclude that the lowering of the temperature had been a sufficient cause for the destruction of the races which once lived in the centre of France. M. Deshayes states that he had observed and drawn the conclusion so generally from so confined a number of observations; and he thinks that, in order to establish a fact so important as that of change of temperature by the aid of observations on the mollusks, it would be necessary to find a great collection of facts, not only regarding fresh-water mollusks, but also regarding the fossil species which inhabit the old beds of rivers and collected these facts, and is thus able to estimate approximately the temperature proper to each of the principal tertiary epochs.

Generic Character.—(Melanopsis, Fér., and Pirena, Lam.)—Animal with a proboscis and two conical tentacula, which are conical, annulated, and each with an occluded peduncle at their external base; foot attached to the neck, very short, oval, angular on each side anteriorly; respiratory orifice in the gutter formed by the union of the mantle with the body. Operculum horny, subspirall.

Shell with an epimeris, elongated, fusiform or conico-cylindrical, with a pointed summit; spire consisting of from six to fifteen whorls, the last often forming two-thirds of the shell; aperture oblong; columnella, truncated at its base, separated from the external border by a sinus, the callosity prolonging itself on the convexity of the penultimate whorl, forming a gutter backwards; sometimes a sinus at the posterior part of the right lip.

a. A single sinus at the external border of the aperture, separating it from the columnella. (Genus Melanopsis, Lam.)

b. Two distinct sinuses at the external border of the aperture, one which separates it from the columnella, the other situated near the union of this border with the penultimate whorl.

Example, Melanopsis atrata (Pirena terrestris, Lat.), Strombus ater, Linn., Locality.—Madagascar.

Fossil Melanopsidees.

Mr. G. B. Sowerby, who also includes the genera Melanopsidees and Pirena under the first generic appellation, says: 'We are not aware that any of the Melanopsidees are marine, for all the recent species occur either in rivers or lakes, and yet most of the fossil species are found in beds that are considered by geologists (in this country) to be of marine formation. We know not what degree of credit is to be given to the assertion of a celebrated author, "that the greater number of the genera of the Pectinibranchia might formerly have contained species peculiar to rivers and lakes as well as to the sea," but this we do know, that wherever the fossil Melanopsidees are found, they are accompanied by many other species of genera that at present only live in fresh water; and therefore we think it might be considered as characteristic of the formation in which they occur.'

M. Deshayes, in his Tables, makes the number of living species of Melanopsidees ten, of fossil species (tertiary) eleven, and notes Melanopsidees buxicoides (prerosa), Dufouri, costata, nodosa, accularia, iceria, as species occurring both living and fossil (tertiary). He assigns as habitats to the latter, Asia, Spain, Greece, and Lycamb. Of Pirena he makes the number of living species three, and of fossil (tertiary) two. In the last edition of Lamarck, M. Deshayes gives nine recent species, and of these he notices Melanopsidees costata, prerosa, nodosa, Dufouri, and accularia 1 (M. subulatus, Sow., "Min. Con."); as occurring in a fossil state, observing that it is to be presumed that the species found fossil at Dax is to be distinguished from M. Dufouri, which occurs in a fossil state in the Isle of Rhodes.

The number of species which are fossil only he makes seven. The number of recent species of Pirena he gives as four, but records none as fossil only. Under Pirena terrestris (Melanopsidees atrata) is a reference to Férauss's fossil Melanopsidees, pl. 2, f. 7, 8c.

Dr. Fitch reports three species with a query, two under the names of Melanopsidees attenuata and M. triarcinata, in the Weald-Clay (Dorchet), and Hastings sand (Sussex), and the third, without a name, in the Purbeck beds (Bucks). MELANORRIGSA, a genus of the natural family of Terebratulaceae, tribe Anacardiaceae, so called from the brown fluid turning black upon exposure to the air, with which every part of the principal species abounds. This tree (M. urata) is familiarly known as the Burmese varnish-tree,
er thesee, but was not described by botanists until discovered by Dr. Wallich, and figured in his splendid work 'Plantae Asiaticae Rariores,' t. 11 and 12. The tribe to which it belongs, abounds in plants yielding a blackish, acrid, and resinous juice used for varnishing and other such purposes, as the Marking Nut and the Japan Varnish-tree. This tree was first seen near Prome, and is found in different parts of Burma and along the coast from Tenasserim to Tavoy, extending from the latter in 14° to 23° N. lat., as Dr. Wallich has identified it with the *Xyela* or Varnish-tree of Manipur, a principality in Hindustan, bordering on the north-east frontier districts of Sihet and Tippera. It grows especially at Kubbu, an extensive valley elevated about 300 feet above the plains of Bengal and 200 miles from the nearest sea-shore. There it attains its greatest size, some, and those not the largest, having clear stems of 42 feet to the first branch, with a circumference near the ground of 13 feet. It forms extensive forests, and is associated with the two staple timber-trees of continental India, Teak and Saul (*Tectona grandis* and *Shorea robusta*), especially the latter, and also with the gigantic Wood-oil tree, a species of *Dipterocarpus*. A second species of the genus, *M. glabra*, has been obtained by Dr. Wallich from Tavoy.

The Thesee forms a large tree, with the habit of *Sempervivus*, and abounds in every part with a viscid ferruginous juice, which quickly becomes black by the contact of the atmosphere. Its leaves are large, coriaceous, simple, very entire, and deciduous. The panicles of flowers are axillary, oblong; those of the fruit simple and lax, with very large rufous and finally ferruginous involucres. It sheds its leaves in November, and continues naked until the month of May, during which period it produces its flowers and fruit. During the rainy season, which lasts for five months, from the middle of May until the end of October, it is in full foliage.

At Prome a considerable quantity of varnish is extracted from this tree, but very little at Martaban. It is collected by inserting a pointed joint of a bamboo, which is closed at the other end, into wounds made in the trunk and principal boughs, which are removed after twenty-four or forty-eight hours, and their contents, which rarely exceed a quarter of an ounce, emptied into a basket made of bamboo and rattan previously varnished over. The collecting season lasts from January to April. In its pure state it is sold at Prome at about 2½ ed. for about 3½ lbs. avoirdupois. (Wall. Mr. Smith, who was long resident at Sihet, and was acquainted with this substance in 15-12, states that it is procurable in great quantities from Manipur, where it is used for paying river craft and for varnishing vessels designed to contain liquids. The drug, he says, is conveyed to Sihet for sale by

the merchants, who come down annually with horses and other objects of trade. In Burma, Dr. Wallich states that almost every article of household furniture intended to contain either solid or liquid food is lacquered by means of it. The process consists in first coating the article with a layer of pounded calcined bones, after which the varnish is laid on thinly, either in its pure state or variously coloured. The most difficult part consists in the drying. It is also much employed in the process of gilding: the surface, being first besmeared with this varnish, has then the gold leaf immediately applied to it. Finally, the beautiful Patr writing of the Burmese on ivory, palm-leaves, or metal, is entirely done with this varnish in its native and pure state. Some difference of opinion exists as to the effects of the juice on the human frame. Dr. Wall is states that it possesses very little pungency, and is entirely without smell, and that both Mr. Swinton and himself have frequently exposed their hands to it without any serious injury, and that the natives never experience any injurious consequences from handling its juice; but he has known instances where it has produced extensive erysipelas in swellings attended with pain and fever. Sir D. Brewster, on the contrary, considers it a very dangerous drug to handle, one of his servants having been by it nearly killed by it. (Wallich, *Pl. As. Rar.,* t. 9, p. 11 and 12; and *Edin. Jour. of Science,* viii., p. 96 and 100.)

MELANERITE, one of the mineralogical names for native sulphate of iron, or green vitriol. [ Loc.]

MELANTh/CE/z are a natural order of poisonous Endogens, very nearly related to Liliacea, from which indeed they are only to be distinguished with certainty by their anthers being turned towards the sepals and petals, and by their styles or carpels being distinct or at least separable. The species vary exceedingly in their appearance, some being subterranean-stemmed herbaceous plants, producing a few flowers without their leaves just above the surface of the ground, as is the case with Colchicum; others forming a stem of considerable size with large leaves and numerous flowers. The consequence of this difference
in their manner of growth is a considerable difference in the appearance of the species, but they are all found to conform to the characters of Lilacaceae, with the difference above explained. Iridaceae, to which they bear a striking resemblance, because of the similarity between Colchicum and Crocus, are readily distinguished by their inferior fruit and triandrous flowers.

The most important species of this order are medical plants, viz.: Colchicum, or Meadow Saffron, which is employed as a remedy for gout and rheumatism; Veratrum album, whose acrid poisonous rhizoma is White Hellebore; Asafoetida officinalis and Veratrum Sabadilla, both of which furnish the seeds called Cebadalins, now largely consumed in the preparation of Veratr.; and a few North American plants of less moment.

Another prolonged into a beak, and having in the bud their points curved downwards, and inserted into sockets between the side of the ovary and that of the calyx. The ovary itself is many-seeded and many-seeded, while he vents with the calyx by vertical plates, which form the partitions between the sockets in which the anthers are confined. The species are extremely numerous in tropical countries, where they usually form bushes or small trees, and are scarcely known beyond the tropics, with the exception of Rhehasia, which straddle into North America. In Europe the order is unknown, unless in gardens, where many species are cultivated for the sake of their gay purple or white flowers. Some of the species bear berries, which are edible, and stain the mouth a deep purple, whereas their name Melastoma, or black-mouth; otherwise they are of no known use to man; not a traced of aromatic secretions being found in them, notwithstanding their near relationship to the aromatic Myrtaceae.

1. A diminished figure of Veratrum Sabadilla; 2. an expanded flower; 3. a vertical section through part of the ovary; 4. a ripe seed-vessel.

MELASTOMA. [SHREWS.]

MELASTOMACEAE, an extensive natural order of polytropical Exogens, nearly related to Myrtaceous. They have opposite ribbed leaves without any trace of dots;

MELASOMA. [SHREWS.]

MELASOMA, an extensive natural order of polytropical Exogens, nearly related to Myrtaceous. They have opposite ribbed leaves without any trace of dots;

1. A branch of Rhehasia speciosa; 2. a vertical section of the flower; 3. a calyx; 4. a transverse section of the ovary.

is given with an English translation, and other specimens of Meli's poetry, in an article 'On the Dialects and Literature of Southern Italy,' in No. IX. of the 'Foreign Quarterly Review,' November, 1899.

Meli has excelled particularly in his 'Ecloghe Pescatorie,' or fisherman's dialogues, in which he has borrowed the peculiar language and humour of that class of people. Unlike Guarini, Tasso, and other courtly writers of pastoral poetry, Meli speaks the language of the shepherd, the shepherd, and fisherman, and fisherman speak their own homely and unpretending language, which is nevertheless susceptible of poetical imagery. The seventh idyll is in a loftier key: it is the lamentation of Polemuni, a man persecuted by fate, forsaken by his fellow-creatures, a despairing outcast, who is represented as seated on a lonely cliff which overhangs the deep waves that have wasted the base of the rock, and have hollowed out caves in it, within which the surge roars in dark eddies. The halcyon has built its nest on the bare sides of the cliff, and its melancholy cry is heard far over the foaming billows. Polemuni was the son of a substantial fisherman, who himself followed for a time his father's trade, had a tight gallant boat, and store of nets and tackle: when on shore he was the gayest of the gay, and the favourite of the girls of his district. Misfortune came: a storm smashed his boat, his love proved faithless, and he found himself sighted and forsaken by all. Houseless and almost naked, he is sitting on the lone cliff with his poor reed in his hand, attempting to follow his wonted occupation, while he utters his grief in song. He remembers his former happy days, and contrasts them with his present bereavement; he rail at the faithlessness of pretended friends, he sees the gloom of despair closing all around him, until at last a fearful tempest breaks forth, the waves swell beyond all bounds, and, rising in one mountain billow, overflow the cliff, and hurl the devoted victim down into the abyss of the sea.

Meli's idylls, which fill the second volume of his works,
are mostly amorous, though not indolent. Some of them are exquisitely finished, such as 'Lu Labbru' (the lip), and 'Lu Pettu' (the breast). An Italian version of them has been published by Professor Rosini of Pisa, which, however, is inferior in gracefulness to the original.

Meli has written a mock heroic poem, under the title of 'Don Chisciotte' (Don Quixote), in which he cancels, with all the spirit of imitation of Cervantes's celebrated novel. It abounds with beauties of detail, but the ludicrous prevails throughout, and often becomes mere farce. He also wrote a volume of fables, besides satires, some of which reflect on peculiar features of Sicilian life and manners, and other mock epistles. His works were collected and published at Palermo, under his own revision, in 1814, in seven volumes. King Ferdinand granted the author a copyright for ten years, and gave him also a small pension, for which the author expressed his thanks in his compositions. Meli died, not long after, at an advanced age.

The Sicilian dialect has assumed, under his pen, a delicacy of refinement which places it foremost among the written languages of Italy. Some remarks on the Sicilian and other folk songs belonging to the natural family of Meli capillaries, are given in an article 'On the Study of the Italian Language and Literature,' in No. X. of the 'Quarterly Journal of Education.'

MELIA (Zoology.) M. Latreille's name for a genus of Concreta (Lydia of M. Milne Edwards, who has since withdrawn the name in favour of M. Latreille's prior appellation). This form approximates to Pilaneus, but has also some analogy with Grapuis.

Example, Melia tessellata. Colour white with red lines; some bars on the feet. Length about five lines.

Locality, Isle of France.

MELIA, so called from Mala, the Greek name of the common ash, which one species of the genus is thought to resemble. It belongs to the natural family of Rhamnaceae, to which it has given its name, and which is, like Melia, characterised by having the filament of the anthers combined into a tube, with the anthers sessile within it, and opening inward; the seeds without wings. The species are very interesting, and are, in fact, the same as the species of the genus Fraxinus, but with the leaves much larger.

Melia Azedarchi, the Neem tree or Margosa tree of the Peninsula of India, has been separated into a distinct genus on account chiefly of its ternary, not quaternary, flowers. The name Neem is derived from the Sanskrit 'Neem,' and the name Margosa from the Spanish name 'Marquésa.'

Locality, India.

MELICERTA. (Zoology.) [PULMOGRADA.] Melicerta and Meliocrates are also used to designate genera of Crustacea. [SALICOIDE.] MELILOT, the Melilotus or Honey-lotus of botanists, so called from its smell, is a tall yellow-flowered annual. It has loose racemes of small flowers formed like those of Clover, of which it was once regarded as a species. The Melilotus officinalis, or Trifolium Meliloti officinalis of Linnaeus, has long roots and a branching stem two or three feet high. It grows wild in woods, hedges, and neglected fields. When cultivated in a dry soil and made into hay, it has a powerful aromatic smell, and mixed in a small proportion with meadow-hay, gives it a agreeable flavour. This plant is used in making the Swiss cheese called Schabzieter. It is ground in a mill, and mixed with the milk. When put into the cheese, which is put into conical moulds and there dried. [CHEESE.]

The white or Siberian melilot rises several feet high, with a strong branching stem. It was strongly recommended by Thouin in a memoir addressed to the Agricultural Society of France in 1770, and has been tried occasionally with some success by various agriculturists, without however having been so generally adopted for cultivation as might have been expected from the high enumerates passed upon it. It will bear four cuttings in the year, and produces a kind of hay which is put into conical moulds and there dried. [CHEESE.]

The MELIoM is distinguished by Dr. Royce from the West Indian M. sempervirens of Schwarz, with which it was united by Dr. Roxburgh. This tree appears to be a native of Asia, though common throughout India; it is called by the Arabs ham, and by the Persians azadi durakht. It is probable that this may be one of the trees included under the Azadirachta of Avicenna. The seeds are bitter, and considered laxative and anthelmintic, as is also the bark. M. tonentia is a species found in the island of Penang, and M. composta, in which are included both M. superba and M. robusta, is a species found in Malabar and Mysore.

MELIACEAE, a natural order of polypetalous Exogents, distinguished from all others by their stamens being united into a complete cup, within, and often below, the rim of which the anthers are inserted. It consists of trees or shrubs with alternate, often compound, leaves, inhabiting all countries within the tropics, but very rare in colder climates. Melia Azedarchi, or Bear-tree, a Syriac plant, now naturalised in the south of Europe, forming the principal exception. In general the species are bitter and astringent, but they are sometimes dangerously poisonous, acting violently as emetics and purgatives. Notwithstanding this, the pulp of the fruit of the Lanne is esteemed in the Indian Archipelago, and that of Milne edulis is eaten in Sibi, where it seems to resemble the Litchi and Longan of China.
by that generally stronger and more perfect confusion which distinguishes them from the more typical families, they form the aberrant groups; that they are united among themselves by general affinities; and that they correspond to the tribe on each side with the conterminous tribes that appear to them, that is, with the Scansoriae at the one extreme, and with the Fissirostrae, with which we first entered on the order, at the other.

Mr. Swainson (Classification of Birds, vol. i.), after observing that he could obtain no opportunity of examining the tongue of the African Sun-birds (Cimieridae), states that by a fortunate chance he had discovered that the type among the Australian Honey-suckers (Meliphagidae) which represents the Trochilidae, has the tongue constructed precisely the same as the Semi-circular, and described it as being `too long as the bill; nor are the bones of the os hyoides carried back upon the skull, as in the woodpeckers and humming-birds. Nevertheless the structure appears especially adapted for suction; the form of the lower part is the same as in other birds; but the great number of delicate fibres or filaments exactly resembling a painter's brush. Lewin, who drew and described these birds in their native region, has figured the tongue of the Black-faced Honey-sucker (Meliphaga phrygia) (Birds of New Holland, pl. 4), and described them as to be seen in great numbers, constantly flying from tree to tree (particularly the blue gum), feeding among the blossoms by extracting the honey with their long tongues from the flower at a rate. The most extraordinary to the scientific naturalist is the fact that some birds of this melipagous group are actually woodpeckers, and yet retain the typical structure of the tongue of their own natural family. The same observer, speaking from that position, described in the long tongue in search of small insects, which it draws out with great dexterity.' Now, as Lewin describes this bird as a honey-sucker, we must conclude, until facts are supplied to the contrary, that this long tongue is the honey-suckers, but that it is used for the purpose, not of spearing insects, but of catching them by means of the glutinous matter on the filaments, a mode of capturing its prey by means improbable, provided the insects were not baited with the honey of the Meliphagidae, several of which are as large as a thrush, and three or four much larger, is restricted, any more than that of the humming-birds, simply to the nectar of flowers. They indeed feed upon the honey, but Lewin declares that they are fed with the insects lodged in most of the flowers, which they extract in a dexterous manner with their tongues, peculiarly formed for that purpose. It is clear however, when we come to reflect upon the matter, that birds which are attuned to the secretion of particular trees, as are many of the Meliphagidae, can only enjoy their favourite food for a comparatively short season, that is, while the tree or plant is in blossom. They must therefore either feed at other times upon small insects or upon fruit. The first two habits we have shown them to possess; and the last, that of devouring fruits also, is exemplified in the yellow-eared honey-sucker of Lewin, who remarks that 'in the winter season these birds have been seen feeding on the sweet berry of the white cedar in great numbers.'

Mr. Swainson makes the Melipagidae the first family of the tribe Teinrostrae; and he thus characterizes these Honey-suckers:—

**Bill** the strongest in this tribe (Teinrostrae), having the middle digit distinctly notched. **Feet** large, strong; the hinder toe much developed. **Tongue** extensible, generally ending in a bunch of filaments.

The following genera and subgenera are placed by this author under the Melipagidae.

**Genera.** Melipaga. (Lewin.)

*Bill* moderate or short, weak; the under mandible not thickened. **Lateral toes** unequal; the inner the shortest. **Feet** rounded or graduated. **Tongue** short; each division ending in numerous filaments. (Sw.)
Subgenus: — Meliphaga. (Example, Meliphaga barbata. "Ois. Dor.," pl. 57, and M. Australasiana.) Pilotois (Sw.) leading to Glyciphila. (Example, "Lew. Bdas.," pl. 6.) Zanthomiza (Sw.) (Example, Zanthomiza Phrygia. Shaw. "Zool. of N. E.," pl. 4, the tenuirostral type.) Antho-
chera* (Horsfield and Vigors), the usual type. (Ex-
ample, Anthocharis carunculata. White's "Voyage," pl. 6.)

Glyciphila. (Sw.)

Habit of Meliphaga. Bill either shorter or slightly longer than the head; the notch in the upper mandible far removed from the tip. Tongue rather short, terminated by numerous filaments. The third and following quills longest and nearly equal. Lateral toes equal. Tail even. (Sw.)

(Example, G. fulvifrons. Lewin, N. H. Birds, pl. 22.)

Anthemiza.

Habit of Meliphaga. Bill rather short. Tongue. Wings much rounded; all the quills more or less terminating in points. Tail forked. Lateral toes equal. The tenuirostral type. (Sw.)

Example, A. ceruleocephala. ("Mus. Carl.," i., pl. 5.)

Legoptilus. (Sw.)

Habit of Cinnips. Bill remarkably long, slender, and curved. Tongue retrac- tile, long, bifurcated, as in Trochilus. Lateral toes unequal. Tail nearly even. The tenuirostral type. (Sw.)

Example, L. cucullata. ("Ois. Dor.," pl. 60.)

Piliorus. (Sw.)

Bill much thickened, slightly curved; the upper mandible dilated, and folding over the base of the under; the margins of both inflicted towards their tips. Nostril lengthened; the aperture linear. Wings moderate, rounded; the first quill spurious; the four next very broad at their base, and emarginate at the inner web. Lateral toes unequal. Tail very long, graduated; the middle feathers lax and narrow. The rasioal type. (Sw.)

Example, P. Capensis. (Lo Vaill. "Al.," vi., pl. 287, 288.)

Manorhina. (Vieill.)

Bill short, robust; the under mandible thickened; culmen arched, and much elevated from the base, considerably compressed its whole length; commissure curved; upper mandible notched near the tip.

Example, M. erithaca. ("Fl. of Orn.," pl. 78.)

Subgenus: — Gymnophrya (Gymnophrya?) (Sw.)

Example, G. torquata. (Lewin, N. H. Birds, pl. 24.) Eido-
pusus (Sw.)

Example, E. bicinctus.

Entomyza. (Sw.)

Bill strong, moderate; culmen much elevated. Nostril large, naked; the aperture large, oval, and placed in the middle of the bill, at the termination of the naked mem-
bra; culmen obtuse, convex. Frontal feathers small, compact. Hind toe and claw very large, and as long as the middle toe.

Example, E. cyanotis. (Lewin, N. H. Birds, pl. 4.)

Philedon. (Cuv.)

Culmen sharp, carinated. Head and face naked. Front with an elevated protrubrance. Hind toe and claw shorter than the middle.

Example, P. corniculatus. (White's "Voy.," pl. 16.)

Myzomea. (Horsf. and Vigors.)

Bill with both mandibles very considerably curved; the sides broad and much compressed. Tongue and nostrils as in Meliphaga. Wings lengthened; the third, fourth, and fifth quills equal. Tail short, even. Middle toe much longer than the hinder; lateral toes equal.

Example, M. N. H. Birds, pl. 19.)

Mr. Swainson inquires whether this is the fifth sub-
genus of Meliphaga or an aberrant Melithecus?

Mr. Vigors and Dr. Horsfield, in their "Description of the Australian Birds in the Collection of the Linnaean Society," after remarking on the three (1836) imperfect state of knowledge with regard to this group, and the constant influx of

* Certhia Novae Hollandiae of old authors; and of which Mr. Swainson is led to believe M. Sericea is only a sexual difference.

† Mr. Swainson has the following note in Anthocharis: — I hardly think it advisable to discriminate these subordinate types by subgeneric names; but as that of Anthocharis has been already done, I have designated what appears to me to be three of the others; the fifth I am unacquainted with.
MELITA. Dr. Leach's name for a genus of Amphipodous crustaceans generally found beneath stones on the seashores.

Example, Melita palmata, Cancer palmatus, Montagu. Colour blackish; antennae and feet annulated with pale grayish.

MELITIA. This term is employed by Peron and Blainville for a group of Medusas, by Lamarck and Lamouroux for Polyporidea, analogous to Isis and Gorgonia. [POLYPHORIA COTICIFERA]

MELLITHEPTUS. [MELIPHAGIDÉ; SUIDE-MANGA.]

MELITO, SAINT, was bishop of the church at Sardis in Lydia, in the second century. He is supposed by some to have been the angel of the church at Sardis, to whom St. John addressed the epistle in Rev., iii. 1-6; but this conjecture is not supported by any ancient writer, and it is also improbable in account of the length it assigns to the episcopate of Melito.

By Polycrates, bishop of Ephesus, in the second century, he is called 'Melito the Eunuch,' probably because he lived in celibacy, in order the better to discharge the duties of his office: the same writer adds, that he was guided in all his conduct by the influence of the Holy Spirit. [Euseb., Hist. Eccl., v. 24.]

Terrutianus, as quoted by Jerome, praises his eloquent and oratorical genius, and says that he was thought by many to be a prophet. Yet he has been charged with heresy; but upon no better ground than the titles, or perhaps a misunderstanding of the titles, of one or two of his works.

During the persecution of the Christians in the reign of Marcus Antoninus, Melito wrote an apology for them. It is addressed to the emperor, but we are not told whether it ever reached his hands. Eusebius, who has preserved an extract from this apology, places it in a.d. 170; Tilmont assigns it to the date of 175; Basnage and Lardner, that of 179.

Melito died and was buried at Sardis before the end of the second century.

Eusebius and Jerome have given lists of Melito's works, of which the most important is a 'Catalogue of all the Books of the New Testament which are universally acknowledged.' This is the earliest catalogue of the O.T. Scriptures found in any Christian writer. It was obtained, as Melito himself informs us, in Palestine, whether he had travelled on purpose to procure it. It contains all the books at that time received as canonical, except Nebuchad and Esther, of which the former is probably included under 'Radas' [Era]. The 'Proverbs of Solomon' are also called 'Wisdom.'

Melito wrote a book on Easter, a fragment of which is preserved by Eusebius, on the occasion of a controversy which arose in Laodicea concerning the time of keeping that feast.

All his other works are lost; but from the title of one of them, 'Concerning the Devil and the Revelation of John,' Lardner thinks it probable that he received the Apocalypse as canonical, and ascribed it to the Apostle John.


MELIZOPHILUS, Dr. Leach's name for a genus of Inseccorial birds. [MERULIDÆ; SYLVIAEAE.]

MELLILITE, a mineral which occurs crystallized. Primary form a square prism. Scratches apatite. Colour reddish or greyish yellow. Lustrous vitreous. Transparent. Specific gravity 3'24 to 3'28.

Fuses by the blow-pipe into a greenish glass; the powder gelatinizes in nitric acid. Found at Tivoli and Capo di Bove near Rome.

Analysis by Carpi: — Silica, 38; Lime, 19; Magnesia, 19; Alumina, 2; oxides of Iron, 12; oxide of Manganese, 2; oxide of Titanum, 4; Oxide of Magnesium, 4.

MELITE. Honey-Stone. Occurs nodular, granular, and crystallized. Primary form a square prism. Fracture conchoidal. Hardness 2'0 to 2'5. Colour honey-yellow, orange-yellow. Streak white. Lustrous resinous, vitreous, Translucent; transparent. Specific gravity 1'597. In the flame of a candle it becomes white and opaque. When more strongly heated it becomes black and falls to powder.

Found at Arten in Thrace, in bituminous wood.

Analysis by Klaproth: — Melite acid, 46; Alumina, 16; Water, 38.

Mellite Acid was discovered by Klaproth in melitite, which is a melitle of alumina; this, when digested in carbonate of ammonia or potash is decomposed, and the alkaline melitite formed is to be decomposed by acetate of lead, by which melitite of lead is precipitated, and this treated with hydro-sulphuric acid is decomposed, and sulphuret of lead is precipitated, while melite acid remains in solution.

This acid has a sour biter taste, is very soluble in water, and also in alcohol, and it crystalizes in colourless needle-form crystals. Neither nitric nor hydrochloric acid produces any effect upon it, but it undergoes some change when heated with alcohol.

According to Liebig and Pelouze this acid consists of—

| One equivalent of hydrogen | 1' |
| Four equivalents of carbon | 1' |
| Four equivalents of oxygen | 32' |
| Equivalent | 57' |

MELIVORA. [RATEL.]

MELLON, a compound of azote and carbon, discovered by Liebig, and is the cyanogen, consisting of the same elements in different proportions, is considered as a compound radical. When dry sulphocyanogen is heated to redness in a retort, it is decomposed; there are obtained a considerable quantity of sulphur and sulphuret of carbon, and there remains a substance of a lemon-yellow colour, which is mellow.

The properties of this substance are, that it has a yellow colour; is insoluble in water, alcohol, dilute hydrochloric or sulphuric acid; but it is dissolved and decomposed by nitric acid and the solutions of potash and soda; and with the last mentioned, ammonia is evolved. Mellon decomposes the iodide, bromide, and sulphocyanide of potassium, when fused with them, iodine, bromine, and sulphocyanogen being evolved. When heated with potassium it forms mellonuret of potassium, which, being dissolved in boiling water, and nitric, hydrochloric, or sulphuric acid being added to the solution, hydromellonuret is formed, which is precipitated, in the state of hydroxide, as a dirty white gelatinous substance, which becomes yellow on drying, and it is slightly soluble in water, has a weak acid reaction, and is not decomposed by hydrochloric or nitric acid.

Mellon is composed of—

| Six equivalents of carbon | . . . . . . . . . . . . . . . 36 |
| Four equivalents of azote | . . . . . . . . . . . . . . . 56 |
| Equivalent | . . . . . . . . . . . . . . . 92 |

and this, with one equivalent of hydrogen = 1, forms 1 equivalent of hydromellonuric acid = 93.

MELMOTH, WILLIAM, bancher of Lincoln's Inn, born in 1666, died in 1743. The work by which his name is known is 'The Great Importance of a Religious Life,' a book of which the author was not known till after his death, and which was published by Way, and in the name of the late Mr. Nicholls. Nichols mentions, in his 'Literary Anecdotes,' that since the death of Melmoth to his time above 100,000 copies of this work had been sold.

MELMOTH, WILLIAM, son of the above, born in 1710, died in 1799, was appointed commissioner of bankrupts by Sir Erasde Wilmet. He was twice married, first to the daughter of the well-known Dr. King, secondly to Mrs. Ogle. He was an accomplished scholar, though not educated at either University, and his translations of Pliny, those of Cicero to his friends, and the treatises on Old Age and Friendship, are generally allowed to be the best in the English language. These translations are made in an easy and pleasing but rather diffuse style. He was the writer of 'Lethe's Letters,' and 'Lethe's Dissertations,' both moral and literary.' He wrote a treatise on the Christian Religion, and Memoirs of his father. Both Birch and Barton, the former in his life of Tillotson, the
latter in a note on Pope's works, mention Malmoth's translations with the highest praise. He also wrote a poem on Active and Retired Life, in Doltshe's 'Collection,' which is chiefly remarkable by its smooth versification and sound morality. (Chalmers' Biographical Dictionary; Nichol's Literary Anecdotes.)

MELO (Maloacology, Broderic's name for a subgenus of Volucra.)

MELOCHOBRIA, a genus of Polyplasia, proposed by Labrousse. The small porous plates of this stone substance are attached to the leaves of marine plants.

MELOCRINUS, a genus of Crinoids, employed by Goldfuss in his 'Vetereacta Europae' for some fossils of the terrigenous class, but it has not yet been mentioned as British. [Encrinita.]

MELODrama. [English Drama, p. 499.]

MELODY (melodia), in music, is Air or Song—a succession of single distinct sounds, in measured time.

Melody and Air are synonymous terms in modern music, whatever their difference may have been in that of ancient Greece; we therefore shall add but little to what we have already said on the subject under the word Air, to which the reader is particularly referred.

The question—which exercises most influence over the mind, melody or harmony? has often been agitated. Rousseau taking the lead, who certainly has treated it eloquently, but inconsistently, the part of advocate on both sides, and of professor of himself; He has agreed to Metastasio, that music is a kind of language, but overlooks the fact, that, like every other language, it can only affect those who understand it by either studying its principles, or in the case of the English, by frequenting those who have been particularly acquainted with it, as in the case of the many. He does not seem to have considered that simple music, that is, melody, like simple language, makes most impression on the unlearned majesty, beauty, and utility of the whole; while the complicated music, like high-wrought rhetoric, excites more pleasure in the minds of the instructed minority, who enter into its combinations and perceive all its relations. Melody and harmony may be said to generate each other, the one being in the selection of single sounds from a hard source, the other a union of two or more melodies simultaneously heard. Thus both are closely connected; and Dr. Burney has remarked, that after melody and harmony have been heard together, nothing can compensate for their separation.

MELOE VESICATORIUS. [Cantharis.]

MELOGALIC ACID. The reference to this article under GALLIC ACID is a typographical error. It should be ACID. [MELOGALLIC ACID.]

MELOLONTHAE, a family of Coleoptera, forming insects of the section Lamellicornes, and subsection Phyllophagi. This family, of which the common cockchafer (Melolontha vulgaris) is an example, may be thus characterised: larvae traverse the vegetables in the inner phyllostachium, and the young pupa forms a meridional long as broad, with the length exceeding the breadth; sometimes nearly heart-shaped, and sometimes square; the anterior margin either straight or notched in the middle, but without any projecting process or tooth; mandibles strong and horny, and having at most but a single membranous appendage, which is situated in a concavity on the inner margin; the apex truncated, and having two or three denudations; maxilla generally horny, and armed in the two sex denudations; antennae usually with more than three lamellae, or very short lamellae; these are terminated by two claws, which are usually furnished with a spine on the under side near the base, and sometimes divided at the apex. The family Melolonthidae consists of three genera: Melolontha, Rhizotrogus, and Serica, and some subgenera of minor importance. Species of this family are found in all parts of the world. In the genus Melolontha the antennae are ten-jointed; the terminal five, six, or seven joints are lamellae and not lamellated; the sixth joint is slender and horn-like; in the females the lamellated joints form a smaller club than in the males, owing to their smaller size, and also to a decrease in their number, there being six, five, or four; the labrum is deeply excavated; the claws of the tarsi are furnished with a spine on the under side near the base; the abdomen in the male sex often terminates in a horn-like process.

Two species of this genus are found in England, the common cockchafer (Melolontha vulgaris, Fab.), of which there is a figure in the article Coleoptera, and the Melolontha fulva, a large species nearly an inch and a half in length, and which is of a black-brown colour, with irregular white markings. This beautiful insect is common in some parts of the Continent, but rare in this country, and has been found chiefly in the neighbourhood of Deal.

The genus Rhizotrogus differs from Melolontha chiefly in having the under tarsal lamellated joints to the antennae, which are nine-jointed.

Rhizotrogus solstitialis, an insect which makes its appearance in the month of June, and often occurs in great abundance in some parts of this country: it very closely resembles the common cockchafer, but is of a smaller size, narrower form, and paler colour.

In the species of Rhizotrogus, as in Melolontha, the claws of the tarsi are furnished with a spine on the under side near their base; but in the next genus, Serica, the claws of all the tarsi are divided at the apex; the body is of a convex, ovate form, generally has a silk-like appearance, and changes in hue according with a change in the direction of the light.

Serica brunnea, a common insect in England, as well as in various parts of the Continent, is about three-eighths of an inch in length, and of a uniform pale-brown colour; the elytra are rather deeply striated, and, as well as the thorax, thickly punctured.

Serica simulans, another British species of the present genus, is of a black colour; the elytra are reddish-brown, and have the suture and outer margin black. This is a smaller insect than the last (being about three-twelfths of an inch in length), and of a shorter, and more rounded form; it also differs from the former in being the generally acquainted with it, as in the case of the many. He does not seem to have considered that simple music, that is, melody, like simple language, makes most impression on the unlearned majesty, beauty, and utility of the whole; while the complicated music, like high-wrought rhetoric, excites more pleasure in the minds of the instructed minority, who enter into its combinations and perceive all its relations. Melody and harmony may be said to generate each other, the one being in the selection of single sounds from a hard source, the other a union of two or more melodies simultaneously heard. Thus both are closely connected; and Dr. Burney has remarked, that after melody and harmony have been heard together, nothing can compensate for their separation.

STICHEIUS is the name of several British species of the present genus, of a black colour; the elytra are reddish-brown, and have the suture and outer margin black. This is a smaller insect than the last (being about three-twelfths of an inch in length), and of a shorter, and more rounded form; it also differs from the forenamed in being the generally acquainted with it, as in the case of the many. He does not seem to have considered that simple music, that is, melody, like simple language, makes most impression on the unlearned majesty, beauty, and utility of the whole; while the complicated music, like high-wrought rhetoric, excites more pleasure in the minds of the instructed minority, who enter into its combinations and perceive all its relations. Melody and harmony may be said to generate each other, the one being in the selection of single sounds from a hard source, the other a union of two or more melodies simultaneously heard. Thus both are closely connected; and Dr. Burney has remarked, that after melody and harmony have been heard together, nothing can compensate for their separation.

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Melons will thrive if their roots are actually allowed to extend themselves in water; and in the case of the floating-beds on which they are grown in some parts of Persia, they find their way through the water support its surface. But a drier medium for the roots becomes essential for good flavour in the comparatively close mode which in forcing them it is necessary to adopt in this country, in order to prevent the dissipation of heat, which would otherwise take place from a limited atmosphere. The temperature and elasticity of which are so much above that by which it is surrounded.

About four months may be allowed, on an average, for the period between the sowing of melons and the ripening of the fruit. In the month of January the climate is not sufficiently warm to sow; and the young plants are so exceedingly tender, that accidents are then very likely to occur to them. It is on this account necessary to make successive sowings, in order to be prepared for replacement, if requisite, and also for continuing the supply throughout the summer. A sowing for the latest crops will require to be made in April.

Melons may be grown by means of frames on hot beds [Hor-Bed], or in pits heated according to some of the various modes of hot-bed application now so generally adopted. The seeds are sown in pots, which are intended for transplanting, and fruiting is prepared for their reception, by placing small hills, rather more than a foot high, of light rich mould below each saucet, and nearer to the back of the frame than the front. Care must be taken that this mould be of the purest, the youngest possible, and for which is to take place when they have made a few rough leaves.

If the roots extend, more soil should be added of a gradually stronger nature; and ultimately the roots should have a depth of about 15 inches of such soil. The soil should never be too deep, because it is intended for a frame which is to be in contact with the air, and if there be no means for previously bringing it to the temperature of at least 70°, it should be put into the frame in small quantities. When water is required, it should never be much below the above temperature, and the temperature should not exceed 80°. It should not be applied when the air of the frame is at a high temperature from sun heat. Shading is necessary immediately after watering, when the sun’s rays have any great degree of power; unless this precaution is taken, the soil will be induced, and the red spider will be likely to attack the foliage.

With regard to pruning and training the runners or vines of melon plants, it is necessary that a sufficient number of these for filling the frame should be made to ramify as close as possible on the base of the frame. As the distance between the young shoots which are intended for filling the frames, as well as for other frames, may be increase, or the branches may be divided by pinching off the top of the latter when it has made a few joints, or four leaves above the cotyledons; and the laterals, which in consequence become developed, may be again subdivided by a similar process. Blossoms of a monocious character will soon after make their appearance. The male blossoms, or at least a portion of them, must be retained for the purpose of fertilisation till the requisite quantity of fruit is fairly set, after which those shoots which have only male blossoms may be dispensed with, in order to afford more space for the foliage connected with the fruit. The extremities of the fruit-bearing vines are stopped by pinching at the second or third joint above the fruit. The vines must afterwards be kept regulated so as not to overcrowd the frame, and not to make contact with the light. The regulation should be early and frequently attended to, so as not to have occasion to remove many vines from the plant, or divert it of much foliage at any one time. A piece of slate or tile is placed under each vine for this purpose, and the soil must be well watered, and kept a proper temperature, and a well conditioned air must be admitted to the frame, and the atmosphere must be free from all unhealthy influences. The fruit should be regularly examined for decay, and the frames kept clear of all vegetation.
that the melon is grown in open fields, intersected in every direction by small streams, between which he elevated beds richly manured with pigeons' dung. Upon these beds the melons are planted. It is further observed that the Persian gardener has therefore to guard against nothing but scarcity of water; the rest is provided for by his own favourable climate. With us the atmosphere, the ventilation, the water, and the heat are all artificial agents operating in opposition to each other. From this it is seen in vain to attempt to bring those fruits to that delicious perfection here which are known to acquire in their native country, except at the most favourable period of our season; for if the benefit of these essential parts pressing favour, a copious ventilation and high temperature, may be frequently combined without the latter being at the same time much counteracted by the former.

The varieties of melons can scarcely be kept permanent, particularly where many are cultivated, as they hybridise so readily. One of the finest, and perhaps the best of all, is the Beechwood melon. The Early Cantaloupe, Windsor, Scarlet Flushed, Cephalonian, Green Fleshed Egyptian, Green Fleshed Italian, Early Polignac, and Golden Rock, are esteemed excellent. Of the Persian varieties the melon the Green Hooisaine, Striped Hooisaine, and the large Ghermek are considered the hardest; and the Melon of Kesieng. Melon of Nukaleian, Sweet Melon of Isphan, and the Geree Melon, are also well flavoured. The Copah is a very large melon, or one of those varieties which are cultivated in the East, and have the property of keeping for a long time after being cut.


MELONIA. [Foraminifera, vol. x., p. 348, where the name of the genus is erroneously printed Melonidia.]

MELVILLE, who mentions the name of a race of people, is a subgenus of Lactea (Sw.). The subgenus is thus characterised:

- General structure of Fragillaria, but the upper mandible is notched near its tip. Hinder claw lengthened, but rather shorter than its toe. Lateral toes equal. Tail even. Head crossed by reticulate lines.

Example. M. erythrophorus. ('Ill. of Orn.; p. 132.)

MELOS. [Mil.] Melpomene. [Musa.] Melrose. [Scot.] Melton Mowbray. [Leicestershire.]

MELUN, a town in France, capital of the department of Seine et Marne, situated on the Seine, 24 miles in a direct line south-east of Paris, or 26 miles by the road.

The town stands on the place where the Abbey church, by the name Melunensis, and perhaps Metisodorus, describes it as being a town of the Senones, situated in an island of the Sequana (Seine), in the same manner as Lutetia (Paris). (B. G., lib. vii., c. 56.) It was taken by Labienus, Caesar's legatus, in his campaign against the Gauls; it was a place of note in the earlier times of the French monarchy, and was repeatedly taken by the Northmen or the English. It was taken, after an obstinate resistance by the governor Barbaran, by the English under Henry V. (A.D. 1419 or 1420; but in 1435 the inhabitants drove them out and admitted the troops of Charles VII.

The town is the most part built on a slope on the right bank of the Seine, and, from the advantage of its situation, appears to have been laid out nor well built. It has a large circular place, and two insignificant promenades. Of its two churches, that of St. Apollos is distinguished by some handsome stained-glass windows. The prefect's residence was formerly a Beu-Aubry, and is the ruins of an old castle on the island, in which the Celtic town stood. The population in 1831 was 6604 for the town, or 6622 for the whole commune; in 1836 it was 6848. The chief manufactures are cotton yarn, printed cottons and other cotton goods, woollen cloths, drapery and serns, leather, window-glass, and earthenware. There are flour and tan mills, and lime and plaster kilns. Trade is carried on in corn, flour, wine, cheese, wool, and cattle; there is a well-kept market for the supply of Paris. There is much meadow-land round the town. There are a prison or house of correction, a barrack for cavalry, and a theatre; a high school, a free drawing-school, &c.

The arrangement of Melun has an area of 390 square miles: the population in 1831 was 57,697; in 1836, 57,721. It is divided into six cantons or districts, each under a justice of the peace, and an elected berger, or custodian of the castle, 'castello puellarum,' that is to say, sheriff of Melun. There was then no sheriff of the shire of Melun: none had yet been constituted, nor for some time afterwards; and the public business was in all likelihood principally transacted in the castle, of which he was said to be sheriff.

In the same reign and forwards to the year 1171, Melun was lord-justiciar of Scotland; then strictly so called, or the territory of the kings of Scotia north of the Frith of Forth (south of the Forth, in the county of Fife, and of Lothian), and of the castle of Edinburgh, then a little fort, which Philip de Malleville, the son of the said Philip, was sheriff of the Mearns from the year 1206. In 1242 he was made sheriff of Aberdeenshire; and in 1240 a joint-justiciar of Scotland with Richard de Montalbarn.

MELVILLE, SIR JAMES, is supposed to have been born in the year 1533. He was the third son of Sir John Melville of Haith, one who early joined the party of the Reformers in Scotland, and afterwards favoured the erasure of Cardinal Beaton, at length fell a victim to his successor, Archbishop Hamilton, in 1549. Young Melville, then about 14 years old, was upon this, sent by the queen dowager's influence and direction, and under the protection of the French ambassador remaining in Paris, to be a page of honour to the youthful Mary, Queen of Scotland. He appears however to have rather continued in the ambassador's employ till 1553, when he got into the service of the constable of France. He afterwards made a visit to England, as a courtier of the Protector, and remained there for some time, but ultimately came to Scotland. It would be a profitable task to follow the knight in all his missions and movements. He was a courtier in the strict sense of that term, one to whom a court was the whole world, and its principles of action the great code of duty. He appears to have had a high idea of his own importance, and sometimes blames himself for the unfortunate temper, which he says he possessed, of finding fault with the proceedings of the great. All this and much more we learn from the two voluminous editions of his correspondence, of which we are careful to write for the benefit of posterity. Two published editions of this curious work were published in English, besides a French translation, but an accurate edition has been recently published from the original manuscripts.

MELVILLE, ANDREW, was born on the 1st August, 1545. He was the youngest of nine sons, children of Richard Melville of Baldo, a small estate on the banks of the South Esk, near Montrose; and he had the manor to lose both his parents when only about two years old, his father falling at the battle of Pinkie in 1547, and his mother dying in the course of the same year. The care of young Melville devolved upon his eldest brother, who was a soldier and died of wounds received in the course of the establishment of the Restoration in 1560. The year preceding this, Melville, then at the age of fourteen, was removed from the grammar-school of Montrose, where he had been for some time, to St. Mary's College, in the university of Aberdeen.

At this time the Reformers, with their able reputation for philosophy and the languages, and repairing to the Continent, entered himself a student in the university of Paris, where he remained two years, when, in order to acquire a more perfect knowledge of the civil law, he proceeded to France. He had scarcely arrived there when, such was the opinion entertained of him, that though a stranger and only twenty-one years of age, he was made a regent in the college of St. Marcen. He continued in this situation for three years, prosecuting at the same time the study of the law, when, on receiving the political disturbances of the place, he retired to Geneva, and was there, by the influence of Beza, appointed to the
chair of humanity in the Academy, which happened to be then vacant. When he received this appointment he was, as to pecuniary means, in a state of almost total destitution. Leaving his books and other effects behind him, he had set out on his journey to Geneva on foot along with a young Frenchman, who wished to accompany him, and on reaching their destination the latter was induced to return. The travelling expenses did not exceed a crown. The quarter's salary, which was advanced to Melville at his admission to the chair, proved accordingly a most seasonable relief. Geneva was a scene to which the mind of Melville was accustomed in his pupil days, and it enabled him to make rapid progress in Oriental learning for which he became so distinguished. There also he enjoyed the society of some of the best and most learned men of the age; but above all it was there the hallowed flame of civil and religious liberty began to glow in his breast, with a fervour which continued unabated ever after. He left Geneva in the spring of 1757, at the urgent request of his friends at home, and returned to his native country after an absence altogether of about ten years. On this occasion Beza addressed a letter to the General Assembly, in which, among other expressions of a like kind, he declared that Melville was 'equally distinguished for his piety and his erudition, and that the Church of Geneva could not give a stronger proof of affection to her sister church of Scotland than by suffering in her behalf.' In his letter, Melville pronounced that his native country might be enriched with his gifts.'

It was about this time Melville seems to have made his first appearance as an author. His earliest publication consisted of a translation of the Book of Job, with several smaller poems, all in Latin, and worthy of the disciple of Buchanan, especially his 'Carmen Moysis.'

On Melville's arrival in Edinburgh, in July, 1754, he was invited by the reverend Mr. Morton to enter his family as a domestic tutor; but this invitation was declined by Melville, who was averse to a residence at court, and preferred an academic life. He was early gratified in this wish; for shortly afterwards he was appointed by the General Assembly to the chair of Biblical literature, and became an important member of the theological sub-council. He was distinguished for his energy, and talents were eminently serviceable, not only to the university over which he presided, but to the whole kingdom and to literature in general. He introduced improvements in teaching and discipline, of great importance, and infused an uncommon ascetic into his pupils. His very talk and conversation were so interesting and instructive that the master of the grammar-school, who was afterwards principal of the college, used to say 'he learned more of Mr. Andrew Melville, cracking and playing, for under his person, than by his lectures than by all his commentators.' It was not however as a mere scholar or acolydian that Melville was distinguished. He took a prominent part in the ecclesiastical disputes of the time, and was an active member of the church, which was held in high esteem. He was also more than once involved in controversy with the privy-council on the then much agitated subject of church government. To him is generally ascribed the overthrow of episcopacy at that time and the establishment of presbytery, and he commonly went afterwards by the name of Episcopomastix, or the Scourge of bishops. His intrepidity was often very remarkable. On one occasion, when threatened by the regent Morton in a menacing way, which few who were acquainted with his temper could bear without apprehension, Melville replied in a language which the regent said was 'the same to me whether I rot in the air or in the ground; and I have lived out of your country as well as in it. Let God be praised; you can neither hang nor exile his truth!'

Another matter to which the attention of the General Assembly was directed was the improvement of the universities. Here Melville also took a leading part. At the end of the year 1758 he was translated from Glasgow to be principal of St. Mary's College in the university of St. Andrews, and there he carried on his useful labours and ability. Besides giving lectures on theology, he taught the Hebrew, Chaldee, Syriac, and Rabbinical languages, and his prelections were attended not only by young students in unusual numbers, but also by the professors of the college. In these scholastic labours however he did not lose sight of the condition of the Church, and being called on to open an extraordinary meeting of the General Assembly in 1767, he inveighed in his sermon in strong terms against the arbitrary and oppressive measures of the court. His boldness gave offence to the regent, and shortly afterwards he was cited before the privy-council on a charge of high treason founded on some expressions which it was alleged he had made use of in the pulpit. The charge was never proved; but being determined to silence him, the privy-council found him guilty of behaving irreverently before them, and sentenced him to imprisonment, and to be further punished in his person and property. Forking his death was ultimately intended, he was urged by his friends to make his escape, and accordingly leaving Edinburgh he went first to Berwick and then to London, where he remained till about the end of the year 1768, when the indignation of the kingdom having driven Arran from the court, Melville returned to Scotland after an absence of about twenty months, and resumed his former station in the university. His sincerity and zeal however were by no means agreeable to the king, who wished to assume an absolute control over the affairs of the Church; and in order to accomplish his wish to get rid of him, the king had recourse to one of those stratagems which James thought the essence of 'king-craft.'

In May, 1769, after the king had ascended the English throne, Melville received a letter from his majesty desiring him to repair to London that his majesty might consult with and other of his learned brethren on ecclesiastical matters. Melville and others went accordingly, and had various interviews with the king, who at times descended even to a low and vulgar with them; but they soon learned that they were interdicted from any communication from his majesty. Melville having written a short Latin epigram, in which he expressed his feelings of contempt and indignation at some rites of the English church, was immediately summoned before the privy-council, found guilty of scandalum magnatum, and, after a confinement of nearly twelve months, first in the house of the dean of St. Paul's and afterwards in that of the bishop of Winchester, was committed to Newgate. He was discharged from prison on the 23rd day of February, 1761, a period of about four years, when, at the solicitation of the duke of Bouillon, who wished his services as a professor in the university of Sedan, he was permitted to depart the kingdom.

In 1769 he died, which had previously been slightly impaired, grew worse, and in the course of the year 1762 he died at Sedan, in the seventy-seventh year of his age, but under what circumstances is not accurately known.

Melville appears to have been low in stature and slender in frame, though his voice was strong, his gesture vehemence, and he had much force and fluency of language, with great accuracy of mind and constancy of purpose. His memory was wonderful, and his power of recitation was great. His piety was active, as is shown by the words of his biographer, 'next to the Reformer I know no individual from whom Scotland has received so many important services, or to whom she continues to owe so deep a debt of national respect and gratitude as Andrew Melville.' (M‘Crue's Life of Melville.)

MEMBRANE (in Anatomy) is an expansion of any tissue in a thin and wide layer. Since the time of Bichat [Bichat], the membranes have been generally enumerated as of three kinds, the serous, the mucous, and the fibrous, which are distinguished as well by the structure and their functions, as by the diseases to which each is peculiarly subject.

The serous membranes are so named from the character of their secretion, which consists of a very small quantity of fluid, in adult human beings. In the higher vertebrata, they form what are called shut sacs. In each of the cavities of the chest, for example, which are exactly filled by the lungs, there is a serous membrane, the pericardium, which lines the inner surface of the heart; the pleura, which lines and completely encloses the lung, and of that which envelops the lung, an extremely narrow space, a sac, into which a very small quantity of fluid is introduced; and finally the peritoneum, which is a constant friction between the lungs and the walls of the chest, which the fluid, by its lubrication of their surfaces, renders easy. It is the general condition of serous membranes, that they exist, with the single exception of the conjunctiva of the eye [Kantor], wherever there is friction between the
surface of an organ and the cavity in which it is contained. They are adapted for this condition by possessing a remarkably smooth polished surface, covered by a very fine layer of epithelium, through which their moistening secretion can easily pass. The basis of their structure is a fine and rather loosely lined tissue, which by falling is at once converted and digested by the serous membranes in man are in the arch, which is found in the cerebro-splanic cavity [Brain], lining the dura mater, and covering the brain and spinal chord, and lining the ventricles; the pleura, lining the chest and covering the lungs [Lung]; the pericardia, the peritoneum, lining the abdominal cavities and covering the abdominal part of the digestive canal, the liver, spleen, part of the pancreas, &c.; and the vagina, forming the sac of the vestibule.

The serous membranes, by which joints are lined, and the heads of bones which move on each other, may be regarded as a modification of serous membranes, differing from the bladder in the character of their secretion and in some of their diseases. [Articulation.]

A membrane very similar to the serous lines the whole vascular system, and forms the internal membrane of the arteries, veins, lymphatics, and tracts, forming a closed easy membrane and secretory vessel, and affording, with its polished surface and fine epithelium, the least possible obstacle to the movement of the circulating fluids.

The serous membranes, like the serous, are named from their peculiar secretion. [Mucous.]

Where the serous membranes, cavities whose surfaces are in contact with living parts, the serous membranes line those canals and cavities which, in the adult condition of man and the higher vertebrates, are exposed to the contact of the air and other inorganic substances. The basis of these membranes is cellular tissue, which does not yield gelatin in boiling, and whose aereola do not contain fat. Their epithelium is thicker than that which covers the skin, thinner then the epidermis covering the skin, to which they are in many respects similar, and affording, with the organs of sense, the mucous membranes are generally best with fine nervous papillae; in other parts, numerous glands for peculiar secretions open on their surface by orifices through which the membrane is continued up the trachea in the character of the very substance of the gland. [Gland.]

Nearly all the acts of mucous membrane in man communicate with each other: they are, the nasal, which lines the cavities of the nose; the conjunctival, which covers the front of the eye-ball and lines the conjunctiva of the eye by the lacrimal gland; the ear [Ears]; the auditory, which lines the cavities of the ear [Ear] and opens into the pharynx; the digestive, including that which lines the mouth, oesophagus, stomach, intestines, and the several glands whose ducts open into the respiratory tract; the respiratory, which lines the trachea, bronchial tubes, and bronchi; and the respiratory tract, and the mammary.

The fibrous membranes are those which are chiefly formed of fibrous tissue. They are the ducts for the protection of important parts, as the pericardium; the dura mater, the fibrous capsules of joints, the sheaths of tendons, &c.; or to envelop and strengthen certain parts, as the peritoneum, fascia, &c.; or they are merely expanded tendons, as the tendons. They are tough and inelastic membranes, composed of the shining dense wavy fibres which constitute the usual structure of tendons, mixed with more or less of a dense cellular gelatinous tissue.

MEMBRANIPORA. [Polypijaria membranacea.]

MEMEYLA/CES are a very small natural order of Polypetalous Exogens, consisting of a few tropical plants of little interest. Most of them inhabit the East Indies, the Isle of France, and Madagascar. They are in habit and structure very unique, but they do not bear flowers in most respects; but they have anthers which in form resemble those of many Melastomaceae, and the leaves have no transparent dots. From the latter order they are distinguished by their leaves not being ribbed, and by their cotyledons being connate. In the opinion of Guettard and Chamisso, it is rather as a section of Melastomaceae than as a peculiar order that Memeeylaceae are to be accounted. No useful properties have been assigned to any of the species, except to Memeeylaceae, whose leaves are an ingredient in the dyes of Ceylonese, according to Roxburgh, and whose ripe astringent pale black berries are eaten by the natives.

MEMEL. River. [Niemen.]

MEMEL (called Klaipeda by the Lithuanians), the capital of the large circle of the same name, in the government of Kingstown, in East Prussia, is situated in 55° 42' N. lat. and 21° 57' E. long. It is the most northern town in the Prussian dominions; and being only 13 miles from the Baltic of Riga, has long been the port of a considerable extensive trade with that empire, which has however been extremely restricted by the very rigorous measures employed by the Russian government. It is situated at the mouth of the little river Danse (pronounced Dancis), near the Kurrusse Hall, which is connected by a narrow channel with the Baltic. The harbour, which is good and safe, is defended by the citadel. Before it there is a lighthouse, 75 feet high, on a sand-hill. Memel is extremely well situated for commerce; and the number of ships that annually visit it may be taken at 708 on an average, of which at least two-thirds are British. The principal articles of exportation are:—timber, which is brought down in floats; hemp, flax, corn, hides, tallow, bristles, wax, feathers, and yarn. The imports are chiefly colonial produce and calicoes. There are breweries, manufactories of saw-mills. The town was formerly well fortified; but only a part of the works now remain, and no use is made of them. There are several public offices and public schools; the churches are four in number, viz., one German Lutheran, one Lithuanian Lutheran, one Roman Catholic, and one Calvinist. None of the public buildings are remarkable. The town is however on the whole regularly built. The population, by the census of 1837, was 9634. Memel is likewise the German name of the river Niemen.

(M. A. Preuss, Beschreibung von Preussen, 8vo. 1835; Stein; Horschelmann.)

MEMINNO, a genus of the subfamily Micchia (Gray) [Mecchiae].

MEMINNION, a personage frequently mentioned by Greek writers. He is first spoken of in the 'Odissey,' as the son of Eos, or the morning, as a hero remarkable for his beauty, and as the vanquisher of Antilocthos. (iv. 188: xl. 521.) Heissid, called him the king of the Ethiopians, and represents him as the son of Tithonos. (Tithonos, 98.) He is supposed to have fought against the Greeks in the Trojan war, and to have been killed by Achilles. In the 'Vergiliana,' a lost drama of 'Aischylus, the body of Meminnon is carried away by his mother Eos. (Fragm. No. 261, Dieterich.) He is represented as the king of the Ethiopians, but he is also said to have been connected with Persia. According to Diodorus (ii. 22), Tithonos, the father of Memnon, governed Persia at the time of the Trojan war, as the viceroy of Tithonos, the Assyrian king; and Memnon erected at Susa, the palace which was afterwards
known by the name of Memnonium. Diodorus also adds that the Egyptians claimed Memnon as a native of their country. Pausanias combines the two accounts: he represents Memnon as king of the Egyptians, but also says that he was sent to Thebes from Ethiopia not from Egypt, subduing all the nations in his way. (Paus., x, 31, § 6; i. 42, § 2) Asklepios also, according to Strabo, spoke of the Cossians, that is, Sueans, parentage of Memnon (xv., p. 720); and Herodotus mentions the palace at Susa, called Memnonion, and also says that the city itself was one of the seven described under the same name. (Herod., v, 53, 54; vii, 151.)

The great majority of Greek writers agree in tracing the origin of Memnon to Egypt or Ethiopia in Africa; and it is not improbable that the name of Memnon was not known in Syria when abandoned at last to Greek tradition. In these buildings there called Memnonian by the Greeks were, in name at least, the representatives of those in Egypt. (British Museum, Egyptian Antiquities, i., p. 267.) The partial deciphering of the Egyptian hieroglyphs affords one reason for believing, with Pausanias (i. 42, § 2), that the Memnon of the Greeks may be identified with the Egyptian Phamenoth, Phamennoth, Amenophis, or Amenoph; of which name the Greek is probably only a corrup- tion of the Egyptian form. The name of Memnon may be rendered ‘city of Ammon,’ or ‘devoted to Ammon,’ ‘belonging to Ammon.’

Memnon then must be regarded as one of the early heroes or kings of Egypt, whose fame reached Greece in very early times, but was somewhat obscured by the name of Amman occurring, with this remark:—‘This is he who is supposed to be the Memnon and the vocal stone.’ He is Amman II., and the son of Thutmose, who was allowed to drive the sheep out of Egypt.

There has been translated from the recent works of Strabo and Pausanias, with the northern march of Alexander, the term of the collegial statues in the Theban plain, on the west bank of the Nile. Its height, according to modern travellers, is about 50 feet; and its legs contain numerous inscriptions in Latin and Greek, commemorating the names of those who contributed to their upkeep. The most remarkable part had in their time fallen down; but at present the upper part exists in its proper position, though not in a single piece. Hereon conjectures that the broken statue might have been repaired after the time of Strabo. With respect to the sounds supposed to come from this statue, it is conjectured that they were caused by some trinkety of the priests. ‘Alexander Humboldt speaks of certain sounds that are heard to proceed from the rocks on the banks of the Oramo at sundown, which he attributed, to confined air making its escape from crevices or caverns, where the difference of the internal and external temperature is considerable. The French savans attempt to have heard such sounds at Carnac, on the east bank of the Nile; and some of the recent writers of this kind of inquiries, have observed this phenomenon, took advantage of their knowledge, and contrived, by what means we know not to, make people believe that a similar sound proceeded from the collegial statues.’ (British Museum, Egyptian Antiquities, vol. i., p. 36.)

The head of the collegial Memnon in the British Museum has no claim to be considered as the vocal Memnon described by Strabo, Tacitus, and Pausanias. The height of the figure to which the head belonged was about 24 feet, which dimensions of the figure the British Museum, i. 9 feet 64 inches high, which is a copy of the great Memnon at Thebes.

(Hamilton's Egyptian; British Museum, Egyptian Antiquities, i.)

MEMNON of Rhodes was the brother of the wife of Artasbus, the satrap of Lower Egypt, and was advanced, together with his brother Mentor, to offices of great trust and P. C., No. 923. The power by Darius Ochus, king of Persia. We are ignorant of the time of Memnon’s birth, but he is mentioned by Demosthenes as a young man in b.c. 352. (Aristocrates, p. 672.)

Memnon possessed great military talents, and was entrusted by Darius the King of Persia, on the invasion of Asia by Alexander of Macedon, with the command of the phalanx in western Asia; but his plans were thwarted and opposed by the satraps, and it was contrary to his advice that the Persians offered battle to the Macedonians at the Granicus. After the defeat of the Persians at the Granicus, Memnon was appointed to the chief command in western Asia, as the only general who was able to oppose the Macedonians. He first retired to Miletus, and afterwards withdrew to Halicarnassus in Caria, which he defended against Alexander, and only abandoned it when he was no longer able to defend it.

After the fall of Halicarnassus, Memnon entered into negotiations with the Lacedaemonians, with the view of attacking Macedonia. He was now completely master of the sea, and proceeded to subdue the islands in the Aegean. He took Chios, and obtained possession of the whole of Lesbos, with the exception of Mitylene, before which place he died, b.c. 333. The loss of Memnon was fatal to the Persian cause: if he had lived he would probably have had the Persian empire. He gave up his prospects of Asiatic conquest, in order to defend his own dominions.

(Ann. Diodorus Siculus; Quintus Curtius.)

MEMNON, a Greek historian of Hercules in Bithynia, lived in the first half of the second century B.C. He wrote a history of the tyrants of his native town, of which considerable extracts have been preserved by Photius; these extracts have also been published separately. The best edition is by Orellus, Lep., 1816. They have also been translated into French by General Gall, in the 'Mém de l'Acad. des Inscriptions,' vol. xiv., p. 279-333. Photius was acquainted with the first eight books of Memnon's History, nor with those which follow the sixteenth. (Phot., ii. 294.) The 'Extracts' of Photius embrace a period from the assassination of Cicero to the death of Bithagoras, which was at least later than 46 a.c.

MEMOIRS, a term, in its application to a particular species of writing, of French origin, and in appearance properly signifies the obvious etymological signification of the word; a narrative or account mainly or primarily intended for no higher purpose than that of simply recording the facts it embraces, or addressing the one faculty of the memory. Perhaps the modern memoirs may be held to properly be comprised by Commentaries or Commentaria (see the meaning of this word in Facciotani, Lexik.), unless when that title was given, in genuine or affected modesty, to writings of a more artificial character properly belonging to the last ends, and the gratification of the imagination and the taste, aimed at in what is properly called a history, are not therefore to be looked for in memoirs, which, when they relate to historical subjects, are in truth not so much history as materials for history. A common description of French works of this kind is Mémoires pour servir (i.e. d' histoire). Most frequently too, but not universally, memoirs detail events in which the writer himself has been personally concerned. Very often the work is purely narrative, and not histori- cal at all; and sometimes materials for biography only, and not a biographical work in the proper sense of the term. Sometimes it is neither historical nor biographical, but merely a discourse or statement on some point in science or literature. There are, indeed, many accounts ( Mémoires de l'Académie des Inscriptions, for instance), and other literary or scientific societies. It may be noted, that when Horace Walpole wrote his amusing account of the last ten years of the reign of George II., probably soon after the middle of the last century, he called 'Memoires,' which is the title he has given his work, was still so far from being completely naturalised among us, that he has retained the French spelling. At the same time, we have several English memoirs—such as the 'Memoirs of the Reigns of King Charles I.' by Sir Philip Warwick, 1701; 'Memoirs concerning the Affairs of Scotland,' by George Lockhart, Ess., 1714; 'Memoirs of John Ker, of Kersland,' by himself, 1726, &c. The French lan- guage, however, has adopted the word Mémoires, for biographical materials which are expressed by the term Mémoires.

MEMORIAL. [Anniv.] Vol. XV.—N
MEMORY is a name given to one of the faculties of the mind, as it is otherwise expressed, of remembering or recollecting. The word is used to denote at the same time the operation or act of remembering, the state of the mind when it exercises the faculty, as distinguished from the faculty itself; but this last is a definition and by far the rarer use of the word. It is the idea of the idea of its having been present before present in the mind, this complex state of mind is a case of memory. We are then said to remember the thing (whatever it may be), the idea of which is thus present to the mind. This is as a rule the faculty of memory.

Mr. Stewart seeks to make a distinction between the memory of events and the memory of things, on the ground that in the former case alone does the idea of past time form part of the complex state of mind. This does not seem to be correct. In all cases of memory, in the memory of things as well as of events, there is (as has been said) the idea of the idea which is now present to the mind having been present before. And this idea is obviously a complete idea, with all the previous time of the idea of the interval between that and the present time are parts. The particular idea of past time, by means of which Mr. Stewart seeks to make his distinction, belongs to the event that is remembered, and has evidently nothing to do with the mental phenomenon of memory. It is the idea of the event having taken place at a past time, and not (which alone is concerned with the mental phenomenon of memory) the idea of the idea of this event having been before present to the mind.

The distinction between remembering and recollecting, which, though not always observed in conversation, it is yet worth while to notice. The ideas that are remembered either come into the mind without any effort on the part of the person remembering, or they come more properly said to remember, in the second to recollect. The effort of recollection may be generally described as consisting in seeking out for different ideas which are likely to recall, by any of the ordinary modes of association, the desired idea. What these modes of association are has already been fully explained in two previous articles, Association and Dreams.

It will be seen that the thing which is essential to the faculty of memory, and which distinguishes it from other faculties of the mind, and which is peculiar to the faculty of memory, is the faculty of recognising an idea which has before been present to the mind, as having been present before. But this faculty of recognition can never be exercised until the idea that is to be recognised has been introduced by some of the ordinary modes of association. The faculty of principle or (as it may also be called) the faculty of association is necessary to the exercise of the faculty of memory. This principle of association, which, though necessary to the exercise of the faculty of memory, is yet only accidentally connected with that faculty, becomes consequently the basis of mnemonic science, or the art of recollection.

The principle of all systems of mnemonics, however much these may differ in complexity, is the same, and simple. It is to select a number of objects which, whether of themselves or by reason of the order of selection, are more easily remembered than those which it is our object to remember, and to associate in our minds each one of the latter set with some one of the former. One of the simplest systems of mnemonics which has been used by the ancient orators, of connecting in their minds the different parts of a speech with different parts of the building in which it was delivered. The different systems of Memories Technica which are given in later and more complex systems of the art. Of these, or of any one of these, it is unnecessary to give a detailed account here. One of the best known is that of Dr. Grey (London, 1739).

MEMPHIS. [Evren.]

MEMPHIS. [Evren.]—The best Castilian poet of the fifteenth century, was born about 1412 at Cordova, the 'alma ingeniorum parentes,' as Nicolas Antonio calls it, on account of its numerous authors, especially Latin, Arabic, Hebrew, and Castilian poets. Although Mena did not show an ardent love of letters till he attained his twenty-third year, yet he so quickly and fully sowed his mind, both in his native city and at Salamanca and Rome, that he was much courted by the elegant poet the Marquis of Santillana, Don Enrique de Villena, the constable Alvaro de Luna, and the rhetores who attended Juan II. This king appointed Mena his Latin secretary, and, what is more, his historiographer, a most honourable office, which he was instituted by Alphonse X., 'el Sabio,' i.e. the 'Learned.' A fatal pleasure spoiled Mena's career in 1456 at Torreluzana, where his friend the Marquis of Santillana erected a sumptuous monument to his memory.

Menendez is probably responsible for 'El Laberinto,' or 'Las Trececientas (coplas),' is a didactic moral poem of the apologia kind, but the scene is different from that of Dante, and it is unlike the work of the Italian poet also both in metrical form and style. It was published for the first time in 1496. Quintana, a high authority (Poetae Spaniae), dwells on it with little of his wonted severity. Souteyry, on the contrary, appears to forget the age in which the poem was written. The scenery, says he, and machinery, are desperate. He has however the gloom and the gloom of Spanish, such as the patriotic end of the naval hero Conde de Niebla: he observes, 'There is no glimpse of imagination, and scarcely a trace of feeling' in it. Even the erudition of the commentator Fernan Nuñez, which must have been prodigious, cannot save this article from the criticisms of this critic. If Mena, coming 200 years after Beroe, is to be denied the title of Spanish Ennius, it is much to be regretted that his more fortunate and immediate successors did not estimate his merit, and themselves imitate him in the spirit of his poetry, and his mould, and the severe infections, which are so congenial to inspiration and originality of thought, and so productive of deep impressions. Mena also wrote some fugitive pieces; 'La Coronacion,' in honour of his patron and friend Santillana, and part of an elegy of 1446, as well as a 'Treatado de la Experiencia,' 1438. This latter was unsuccessfully continued by Gomés Mauricio, Pero Guiller (styled 'el gran trobador,' probably of Segovia), and Jeronimo de Olivares, Knight of Alcantara. He also wrote 'Versos de Amor,' 1437, and 'Canto de la Damaisa.' From these memoirs on noble families of Castile ('Librea de Linage'), and a portion of the Iliad in Spanish, still in MS., are probably attributed to him. This is not the case however either with the first act or the whole of 'La Celestina,' or 'La Tragi-Comedia de Castigo a Medida,' which was begun by Rodrigo Cota, and continued in a different style by Fernandez de Rojas; nor with the anonymous 'Coplas de Mingo Rebulo' (a satirical elegy against Enrique IV., not Juan II., as Bouterwek has hastily fancied); nor the commen- taries on the Iliad, which were published by Pulgar, according to Mariana, year 1472 of his history) and the learned Sarmiento ('Obras Postumas'). The primitive sources for Mena's biography are, Barichler Fernandez Gomez de Coba Real ('Centon Epistolare'), Valero Francisco de Albornoz, and the 'Compendio Historico.' He was posthumously censured, the editor of the corrected edition of all his works, which Lucas Junta published at Salamanca in small 12mo. in 1587, and which was the foundation of a 20th, published in 1604 at Madrid, in small Spanish 8vo., by Repolles. This has however over the writer of Fernan Nuñez above mentioned, who is not to be confounded with the chronicist Fernandez Perez de Gusman.

MENAGE, GILLES, was born at Angers (where his father, a man of considerable means, held the office of Avocat du Roi), on the 23rd of August, 1613, as he has himself informed us in his 'Anti-Bailie,' chap. 71, where he inveighs with no small bitterness against the malignity of Baillet, who, in his 'Jugemens des Savans,' had made him a most scandalous abuse to be the unremorseful observer Ménage, that the older I am, the more respect I owe me, and that Callistratus, the jurisconsult, on the fifth law of the Digest, 'De Juris Humanitatis,' has said: "In our state, old age hath been at all times venerable; but innocence, when it goeth beyond, won't deserve the honour as to magistrates." Ménage began life by practicing as an advocate at Paris; but finding this profession not to suit his taste or his temper, he got himself made a haberdasher, which enabled him to hold some livings in the church without ecclesiastic title. He took the name of the family of Cardinal de Retz; but he finally established himself in a house of his own in the cloister of Notre Dame, which soon became celebrated for the assembly of men of letters, whom he continued to gather around him on
the Wednesday evening of every week to the end of his long life,—his Mercureiai, as he called them, from the Latin name for that day. A very considerable range of learning, an admirable memory, and some wit enabled Ménage, notwithstanding a pedantry which was often ridiculed, to maintain his position as the central figure of these reunions; and he also made some small profession of gallantry, both Madame La Fayette and Madame Serigné having the honour of ranking him among their suitors. So, with all his military exertions however did not prevent him from writing a great many books, which brought him a wide reputation, and were highly applauded in his own day by the general voice of the literary world, although the satiric and contemptuous style in which they were written did not make him a good many enemies; and one unfortunate performance in particular, his Réquête des Dictionnaires, published in ridicule of the Dictionary of the Academy, for ever shut against him the doors of that institution, or at least restricted him to a seat till he thought himself too old and infirm to accept one when he might have had it. (See the account he himself has given of this affair in Anti-Ballet, chap. 82.) Of his numerous works, the following are the most important: Les Ordres de l'Ouest (1631); Les Ordres de l'Ouest, qui sont les plus honorables du monde, in the annexed order; and the work published under the title of Dictionnaire Etymologique de la Langue Française, folio, 1694, and 2 vols. folio, 1750; Poëme des Héros, des Heroïdes, des Amours, of which the first canto was published in 1693, and the second in 1701; Poèmes et Idées tirées de la Langue Française, 2 vols., 1694, 1695; Poèmes de l'Éloge du Prince, 1705, 1706, and 1707; Histoire de la Langue Française, 2 vols., 1712; and Réquêtes des Dictionnaires, published in ridicule of the Dictionary of the Academy, for ever shut against him the doors of that institution, or at least restricted him to a seat till he thought himself too old and infirm to accept one when he might have had it.

After his death, which took place in 1692, his friends published, under the title of Ménagiana, a collection of his bon-mots and other remarks made in conversation, upon the value of which Buteau, in his Dictionary, has pronounced a judgment that gives it a high rank, considering it was so generally considered to be one of the best, if not the very best, of this class of works. It was originally published in two volumes, the first of which appeared in 1693, the second in 1694; but the best edition is the third, published in 1714, and augmented by the learned editor, M. de la Monnoye, to four volumes.

MENAI BRIDGE, across the Menai Strait, where it connects Caernarvonshire with the Isle of Anglesey, at the rocky point of the island of Anglesey and the peninsular in the latter, is the finest Suspension Bridge hitherto erected, and a noble monument of the scientific skill of the late Thomas Telford. Formerly the passage between Anglesey and the opposite mainland was kept up by six ferries, the chief of which was that of Menai Bridge, a very dangerous and tedious passage, at a distance of three miles; but a permanent connection, by means of a bridge, had been in contemplation, and various projects for one had been considered long before the present structure was undertaken. In 1785 a petition for such a bridge was presented to parliament, but the scheme was deferred for a further period, and not until Oct. 28, 1785, was a contract given to Mr. Telford for the construction of the bridge, which was eventually completed in 1826, the work being commenced in 1825. The bridge is nearly a mile long, and consists of two arches, each 250 feet, with a stone arch between each of the two, 100 feet in span; the other at Ynys-y-Moch, with a single cast-iron arch 500 feet, to which latter he himself gave the preference. The subject excited much public attention, but great doubts were entertained of the practicability of the plan. In the meanwhile Telford published his design for Rumney Bridge, with a centre opening 1000 feet wide, and two others of 500 feet each. Upon this he was directed by the Act of Parliament, which also authorized him to construct a suspension bridge, for the passage across the Menai.

The site fixed upon by him at Ynys-y-Moch was highly favourable, the opposite shores being bold and rocky, and allowing the roadway of the bridge to be 100 feet above high-water mark. The distance between the supporting pyramids or points of suspension was proposed to be 560 feet, the height of the pyramids above the level of the roadway, the main chains to be 16 in number, with a deflection of 37 feet, their ends being secured in a mass of masonry built over stone arches between each of the supporting piers, or pyramids, and the adjoining shore, and these arches, four on the Anglesey side, and three on the Caernarvonshire side, being each 50 feet in span. The roadway is divided into two carriage ways, each 12 feet wide, with a footpath 4 feet wide between them.

The plan having been approved of by parliament, the sum of £20,000 was voted to enable the commissioners to commence operations. Accordingly, in July, 1818, all the requisite preparatory steps were taken, labourers were engaged, workshops built, and the levelling for the foundations commenced, when such opposition was made to the scheme, that the commissioners were obliged to apply to parliament for an act to confirm and amend their powers. Although this occasioned considerable delay, all the preparatory works continued to be proceeded with. The new bill was brought before the House of Commons on July 2, 1818, and was laid on the 10th August following. The three arches on the Caernarvonshire side were keyed in on January 18, February 27, and March 25, 1822; those on the Anglesey side, on August 31, September 13, and September 23, of the same year. In March of the following year the ironwork for the attachment of the main chains to the rocks was begun to be fixed; and in July a new act of parliament was passed, conferring greater authority on the commissioners than which the Treasury issued 186,492 l., for completing the bridge and paying the sum awarded by the jury for the purchase of Bangor Ferry. In 1824 the works were so far advanced, that the only remaining difficulty was, 'How are the main chains to be put up?' and the answer was, 'The plan which the Treasury had speculatively adopted, and of which no precise details had been determined up to that time, which was so far an advantage, that the engineer had the benefit of full consideration and experience, and many mistakes were observed which must have happened had the details been all settled beforehand.

In the beginning of May the cast-iron segments and saddles were carried up to the pyramids; but it was not till the April of the year 1825 that the first chain was fixed, which was most satisfactorily done. After the second chain had been put up, it was found necessary to replace some of the bars which had been damaged; and owing to this it was practically ascertained that if one or more links of a chain should at any time be injured, the remaining links might be immediately replaced. By the end of August the last chain was fixed, and by the end of August the whole of the suspended parts of the chain had been connected with each other; and on the 2nd September the suspending of the roadway-bearers was commenced. In January, 1826, preparations were made for opening the bridge, and on Monday the 30th the mails drove over it for the first time. Shortly after however (February 6) a tremendous gale did considerable damage to the iron-work, and repeated gales during the spring tended greatly to retard the necessary operations in repairs. But no inconvenience has been since felt; and there is reason to believe that, with ordinary care and attention, this noble structure will last for ages.

With respect to the constructive details and operations of the work, those who wish for such information will find all the particulars in a large folio by W. Alexander Provis, the superintendent engineer, entitled, An Historical and Descriptive Account of the Suspension Bridge over the Menai Strait in North Wales, etc. London, 1828. All that we add is the following (as given by Drevy in his work on suspension bridges):

The weight of the 16 main chains between the points of support, including connecting plates, screw-pins, wedges, &c., is

- Tonns, cwt. qr. lb.
- 394 5 0 16

The transverse ties are

3 16 2 20

The suspending-rods and platform, &c.,

245 13 2 27

Making the total suspended weight 643 15 2 7

N. 2
According to Mr. Rhodes's experiment the tension on the iron at each point of suspension is 1.7 times the whole suspended weight, or 1094.42 tons. The entire section of the bars of the chains is 360 square inches, which would bear 7200 tons with the standard of 9 tons per square inch, the chains will bear without any risk (9 x 360 = 3240) tons, or 3240 - 1094.42 = 1245.5 tons more than the strain produced by the weight of the bridge itself; consequently it may safely be loaded with 17 or 7231 tons, besides its own weight.

Menander, a Greek comic poet, one of the three who were called the writers of the new comedy, was born B.C. 341, and died, as some suppose, by drowning, B.C. 291. According to Suidas he was the son of Diophetes and Hesistratus, was cross-eyed, and yet of mind sound enough. The same authority says that he was incomparably addicted to women. He wrote more than one hundred comedies, of which only fragments remain, but in spite of this fertility, and although the most admired writer of his time, he was only eight times voted. His name was Thespomnatus, according to the testimony of Pampphila.

All antiquity agrees in praise of Menander. We learn from Ovid that his plots all turned on love, and that in his time the plays of Menander were common children's books—

* Fabulae juveniles saea est amore Menanderi.*

* Scideat hic poeta virginitatem suam.*

Ovid, *Trist. ii. 579.*

Julius Caesar called Terence a 'dimidiatus Menander,' having reference to his profound knowledge of the Athenian drama. Plautus preferred him to Aristophanes, and Dion Chrysostomus to all the writers of the old comedy. Quintilian (Inst. Orat. x. 1. 69) gives him unqualified praise as a delineator of manners. From these notices, from the plots of Terence, and from an awkward compliment passed upon him by Aristophanes the grammarians, we may infer Menander to have been an admirable painter of real life. His effeminate and immoral habits, and that carelessness in his verses, which subjected him to the charge of copying the comic phrasing of his contemporaries, as well as his fashion rather than the imaginativeness of the poet. And indeed the writer of what is termed the new comedy (that namely, which satirised characters, not persons) had more occasion for knowledge of the world than for higher qualities, just as the fashionable novel-writer of the present age has more need to be a nobleman or a member of parliament than a philosopher or a speculative thinker. It has been observed that there is very little of the humourous in the fragments, and what remains of it cannot judge a play by fragments. Sheridan's plays, if reduced to the same state, would be open to a similar charge, although he is perhaps the most witty writer of any age or country. The essential aim of the comedy of manners is to excite interest and laughter, not tears.

The plays of Menander were probably very simple in the dramatic action. Terence did not keep to this simplicity, but, as he tells us himself, he added to the main plot some subordinate one taken from a different piece of Menander; thus, as he says, making one piece out of two.

Between the time of Aristophanes and that of Menander a great change must have taken place in the Athenian character, which was probably mainly brought about by the change in the political condition of the Athenian state. The political result of the decline from the noble patriotism which characterised the plays of Aristophanes at a time when Athens was struggling for supremacy in Greece; and in the time of Menander, Macedonian influence had not yet extinguished the spirit that animated the conquests of Marathon and Plataea. Manners probably had not changed for the better in Athens, though the obscenity and racy of Aristophanes would no longer have been tolerated. The transition from coarseness of expression to a daintier propriety of language undoubtedly hastened the history of the language in every country. Thus the personal satire and the coarseness which characterised the old comedy were no longer adapted to the age and circumstances in which Menander lived, and there remained nothing for him to attempt as a new and dainty and at once satirical comedy in which, by the unanimous judgment of all antiquity, he attained the highest excellence.

The fragments of Menander are principally preserved in Athenaenus, Stobaeus, and the Greek lexicographers and grammarians. A good critical edition of the fragments of Menander and Philemon, by Meineke, was published at Berlin 1823, 6vo. It seems possible that some of the plays of Menander may yet exist; at least there is evidence to the fact of some of the plays having been in existence in the seventeenth century. (Journal of Education, i. 186.)


Menander Protector, a Greek writer, who lived at Constantinople during the 4th century, is one of the emperor's body-guard, whence he derived the surname of Protector. (Cod. Theod. vi. 24.) He wrote a history of the Eastern empire from A.D. 559 to A.D. 582, in eight books, of which considerable extracts have been preserved in the *Bouges Liability,* attributed to Constantine Porphyrogenetus. The best edition of Menander is by Bekker and Niebuhr, Bonn, 1830, together with the fragments of Dexippus, Eunapius, Patricius, &c.

Menahem Ben Israel, a celebrated Jewish Rabbi, was born in Spain about A.D. 1604. He was educated in Holland, whither his father, Joseph Ben Israel, had fled to escape the persecution of the Inquisition. At the age of eighteen he succeeded his tutor, Rabbi Isaac Usiel, as preacher and master of the Talmud at Amsterdam; and he soon after commenced his work entitled 'Conciliator,' on which his reputation as one of the most learned and accurate of Jewish theologians chiefly rests.

At the age of thirty-five he lost his fortunes through the confiscation of his father's property by the Spanish Inquisition; and in consequence of this loss he betook himself to commerce, a necessity of which he grievously complains on several occasions. The interruption occasioned by this loss was of great moment to his studies. He came over to England during the Protectorate, and was graciously received by Cromwell, from whom he obtained some favours for his nation. He died at Amsterdam, about 1639.

Menasseh lived on terms of intimacy with several of the most learned men of his age, by whom he was highly esteemed for his erudition and moral character. Grotius testified his respect for the Rabbi's learning by consulting him on the most difficult points of theology, and by recommending his works, especially the 'Conciliator,' to the attention of biblical students. Menasseh was strongly attached to Judaism, and some of his works are disfigured by the introduction of invectives against Jesus Christ.

The following are his chief works:

**1. Nova Synagoga, cónsulat Židův,** published in Spanish at Amsterdam in 1632. A Latin translation of this work, by Dionysius Voss, was published at Frankfort in 1633, with the title, 'Conciliator, sive de Conveniuntia Locorum Sacrorum quaestionum,' and was reprinted in 1636 as 'Resurrectione Mortuorum,' Amst., 1636. 3. 'De Creativae Problematibus xxxi,' Amst., 1635. 4. 'De Termino Viti Libri iii,' Amst., 1639. 5. 'Spes Israelita,' and in Spanish, 'Esperanza de Israel,' Lond., 1658. 6. 'A Defence of the Jews in England,' Lond., 1658. 7. An edition of the Hebrew Bible, in 2 vols. 4to. Amst., 1635.

Mendelssohn, Moses, was born at Dessau, in 1729, where his father Mendel was a schoolmaster. Being a Jew, he instructed his son in the Hebrew language and literature, and it was at Dessau that Moses learned to be instructed in the Talmud by others. The celebrated work of Maimonides, 'Moreh Nevochim' (the guide of the wanderers), he studied with such zeal that an impaired constitution and a distorted spine were lasting marks of his effort. This work however did not exhaust his mental powers. In 1742 he went to Berlin, where he subsisted on the small bounties of the members of his own persuasion; but his mind was greatly improved by his acquaintance with the superior intelligence of Israel Moreh, a Jewish mathematician, urged him to read Euclid's 'Elementa,' a physician named Kisch instructed him in Latin; and by the aid of Dr. Aaron Solomon Gumpertz, he became acquainted with modern literature. He lived for some time in the humble condition of a bookseller's assistant, and a publisher, named Bernael, took him into his house as an instructor to his children. Subsequently he became a superintendent in the factory, and was ultimately taken into...
partnership. His intimacy with Lessing began in 1754, and is said to have been of the greatest advantage to him. Philosophy now became his favourite study, and his first work was his ‘Briefe über die Empfindungen’ (letters on the sensations). He published other philosophical works from time to time, and gained a high reputation for acuteness rather than for originality of thought: his excellent moral character also greatly contributed to the respect in which his religious authority was held. His ‘Jerusalem, oder über Religöse Macht und Judenthum’ (Jerusalem, or on the Power of Religion and Judaism) appeared in 1783. He had begun his philosophical work entitled ‘Morgenstunden’ (morning hours), of which the first volume was published when he received Jacobi’s ‘Essay on the Doctrine of Spinoza. He then persuaded his wife (the de- ceased) with Spinozism; a charge then much more heavy than at present, when many German philosophers are avowed admirers of Spinoza. The zeal with which he defended his friend by a written answer excited him to such a degree, that reasoning with him, most, if at all, was sufficient to terminate his existence in 1786.

As an instance of the successful pursuit of knowledge under difficulties, Mendelssohn is immortalised; and to do him full justice, the circumstances of his life must be remembered. He was, probably, the first of his countrymen who was translated into almost every European language: this is his ‘Phedon,’ a dialogue on the immortality of the soul, held between Socrates and his disciples. The characters are taken from Plato’s dialogue of the same name, and the dialogue in the main monotonous. But the infinite wisdom and cerebral power of the philosopher have made Socrates produce new arguments in place of those attributed to him by his disciple Plato; thinking these new arguments better adapted to the correction of modern errors. The folowing is his principal and indeed his only peculiar argument, the rest of the dialogue being employed in its defence, and in expressions of reliance on the goodness of the Deity. For every change three things are required: first, a state of the changeable object, which is characterised by the change that follows the change; and thirdly, a middle state, as change does not take place at once, but by degrees. Between being and not-being there is no middle state. Now the soul being simple, and not, as a compound body, capable of resolution, could not, if it persis, be absolutely annihilated; and in its change from death to life, it must pass at once from being to not-being, without of course going through any middle state; a change which, according to the three requisitions of change, is impossible. Thus by reason of immortality, the soul is proved. Kant, in his ‘Critik der reinen Vernunft’ (second edition*), has shown the futility of Mendelssohn’s argument, while he admits its acuteness in perceiving that mere incapability of resolution into parts was of itself not the immediate foundation of the immortality as had been supposed by many philosophers of the time. Mendelssohn, by assuming that change must be gradual and not sudden, thought that he had established his point, as the soul, being simple, could not admit of gradual resolution. Kant, however, shows that we may conceive a gradual annihilation even without resolution into parts; or, to use his own expression, a diminution of the intensive magnitude. Thus a deep red colour may grow fainter and fainter at first, and then, as it grows faint, and without any diminution of the surface coloured. Another fallacy in Mendelssohn’s argument is that his definition of change applies only to a transition from one state of being to another, and therefore does not include a transition from the state of not-being to the state of being, there is no occasion for an argument at all, as the continuance of being is assumed in the definition of change, nor would anything be gained by supposing the soul in such a paradoxical state as nonentity with still a sort of being among atoms.

A magnificent edition of Mendelssohn’s works was published lately at Berlin: an English version of the ‘Phedon’ appeared in 1789 and also in 1838.

MENDICANT [Lozana]

MENDIP [SOMERSET]

MENDIP HILLS, a long ridge of limestone extending from Wells in Somersetshire to the Bristol Channel at Bledyton Hill and Brean Down. Through its whole length it is what geologists term an anticlinal axis, the strata dipping to the north, under the drainage of the Avon and the Yeo, and to the south under the low plains watered by the Axe and the Broe. This axis passes from Frome by the Beacon Hill above Sheepstor Mallet, Maudit Castle, Nine-Barrow Hill, and Black Down, to Bledyton Hill, Uphill, and Brean Down, from whence, according to Buckland and Conybeare, it may be supposed to be continued into the Ship Holm in the Bristol Channel.

Along the line of the axis of Mendip old red-sandstone strata show themselves for considerable lengths, and form the nucleus of this miniature mountain-range. They are exposed on the roads from Wells to Chetwin Mendip, and to Harkyn, in each case lying on the carbo-ferrifereous limestone. Upon the slopes of this limestone, both north and south, rest considerable stratified masses of what is often justly termed magnesian conglomerate, and this is covered by the general mass of red marls which fill so large a tract in the low parts of Somersetshire. The limestone series is estimated by Buckland and Conybeare at from 500 to 700 yards thick. The axis of the Mendip Hills runs irregularly east and west: the geological era of its principal upward movement appears to be anterior to the red marls, and probably the time of the Older Carboniferous, though they may have been broken and re-formed. Here the upturned and almost vertical strata of mountain-limestone are found covered by horizontal strata of oolite, each of these contrasted rocks containing the characteristic fossils which are frequent in that district. What renders the case more curious is the fact that the level surface of the subjacent inclined beds of limestone is not only worn smooth by littoral action below the oolite, but also covered by attached oysters, and perforated by the lithographic shells of the oolite series, which are large and full, now full of the oolite, and partly retaining the boring shells not uncommon in that rock.

The most elevated point of the Mendip Hills is Maudit Castle, about 999 feet above the sea-level.

The features of these hills remind the observer of some parts of northern Derbyshire, both in the wide bare surface of limestone and the rugged glens which suddenly break the dullness of the open country. These narrow valleys appear like creeks and fissures in the mass of calcareous rocks, which, in Cheddar Cliffs, rise 285 feet perpendicular early from the bed of the spectator, and undoubtedly exceed in grandeur the noblest rocks of Derbyshire or Yorkshire. Several of these glens are called ‘combes,’ and Brocklecom Beame can be taken as a beautiful example of the mixture of gray rock and antient wood.

From the chasms just alluded to the transition is easy to the cavens and internal fissures, which are numerous in Mendip. Many of these have become familiar to geologists by the uncommon abundance of bones found in them by a host of explorers since the days of Catcott, the celebrated and unfortunate explorer of Cucko Hole.

Dr. Buckland, in his ‘Reliquiae Diluvianii,’ describes, from the notes of Mr. Catcott and Mr. Conybeare, the circumstances under which the teeth and bones of elephants, horses, oxen, stag, bear, fox, and other animals of the Mastozootic period, were found at Hutton. The bones were found in the ochre-pits, which were antiently worked; they were mostly white, well preserved, and appear to have been drained in by water, or collected from the falling in of quadrupeds roving on the surface.
MEN

At Boughton, in the Mendip Hills, and also in Wekehole, a celebrated cavern near Wells, human bones have been found of high antiquity, but being accompanied by urns or other marks of sepulture, it is not supposed they belong to races contemporary with the mammoth and large cavern bear. The specimens of this latter animal in the cave at Hutton are amongst the most enormous built.

Not far from Hutton Hole is the less renowned cavern of Banwell, explored under the direction of the bishop of Bath and Wells. The best collection of the contents of this rich repository is to be seen near the mouth of the cave, at the house of Mr. Beard. The complicated parts of this cavern are accessible by steps made in the rock, and are much visited. The bones belong chiefly to oxen and deer. Bones of elephants, bears, and other carnivora occur less frequently, and the specimens in admirable preservation, and contrast remarkably with the fragmentary bones of the same animals at Kent's Hole and Kirkdale.

Very recently Mr. Long communicated to the British Association at Newcastle a notice of human bones found in a cave at Cheddar.

The Mendip Hills, in their metalliciferous products, resemble the similarly constituted mountains of Derbyshire and Flintshire. They yield galena, calamine (carbonate of zinc); antimony; also iron, lead, and copper. The calamine occurs principally in limestone; the calamine belongs to the overlying magnesian conglomerate. In that rock agates occur, and the large geodic crystallizations of quartz called 'potato-stones.' The fossil corals, shells, tri- lobites, &c. of the Mendips have been long known to collectors; but a complete account of them has, we believe, never been prepared.

(Coneybeer and Phillips, Geology of England and Wales; Boscawen, Geology of the Coal District of England, in Geol. Trans., vol. 1, new series.)

MENDOCINO, CAPE. [CALIFORNIA.]

MENDEZA, INIGO LOPEZ, better known as the Marques de Santillana (Sancho Juliana), was born in 1595, at the town of Alujar, in the province of Granada, and died in 1627. He was the son of the poor Pero Gonzales Mendez, and a descendant of that Mendez, who, in the battle of Aljubarrota, saved the life of Juan I. at the expense of his own. (Romane de Huirado de Velarte: 'El Caballo vos han muerto.') He was also the father of the first duke of Infante, who secured the preservation of his valuable library and directed it to be kept at his palace of Guadalajar.

Santillana was the most elegant scholar at the court of Juan II., then the most brilliant in Europe. Much of his poetry is said to be lost or lying dust. Several of his pieces however, chiefly devotional and amatory, are contained in the older Cancioneros. Like the compositions of D. Juan Manuel, the marquis Enrique de Vergara, and men of his epoch, they exhibit a singular contrast with the license of that period. They can, perhaps, be due to the indomitable spirit of that heartless bigot Philip II., who banished from his court this old servant, then sixty-four years of age. This act of royal severity proved however beneficial both to the illustrious veteran and to posterity. In his retirement at Granada he lived the life of a hermit and wrote an imitation of the Latin historians that modern Spanish literature possesses.

The rich and florid diction of this history forms a contrast with the coarseness and rigidity of Sallust, with whom however Mendez has generally been compared. The modern historian is a model of impropriety, and he does not even spare his own brother. Having been an eye-witness of most of the events which he has so admirably recorded, he has happily combined in the same work the strictest accuracy with integrity and the ability of a great writer.

In 1575 Mendez, ana desire to return to Madrid on business, but he died shortly after his arrival there. He bequeathed his valuable library to the king. Ambrosio Morales, Nico. Antonio, Bouterwek, and many others, are profuse in their eulogiums of Mendez. Juan Diaz publishes some poems in 1580, and the works of this celebrated writer are celebrated by Portalegre, who prefixed to it the author's life, which, although ill written, is highly interesting. In this work, the finest specimen of the historical style in the Spanish language, Mendez has left the best example of an imitation of the Latin historians that modern Spanish literature possesses.

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défiguré par les Arabes') was an Alexandrian, who observed the stars for a long while at Rome, and was living there in the time of Trajan. He is mentioned by Proclus and Pappus as the person in whom the Thaumasios, or 'Two Eyes,' who mentions a mathematician of that name. Pappus gives the titles, or other mention, of at least two works of Menelaus which have not come down to us. Ptolemy, in the Syntaxis, compares some of his own observations with those of Menelaus.

The only writing of Menelaus which has come down to us is the Latin treatise on spherical geometry, translated from the Greek; the Greek is probably lost. This work, in three books, was published (Lalande) in a collection of Greek and Latin authors (Renard, Lalande, Heibullnron) by Mersenne, in his 'Universum Geometricorum Synopsis,' Paris, 1644; also (Heibulleron and Weidler) by Regiononunus. Another work on chords, said by Heibulleron to be contained in Mersenne's Synopsis; this is a mistake, since the work is entirely lost.

The books of Menelaus on spherical geometry have been much used by Ptolemy in the Syntaxis, and the latter had gone over and above those propositions which appear in Menelaus, and which have been much used by Carnot and others in the modern extensions of geometry. These are the well known propositions relating to a transversal which cuts the three sides of a triangle and two of its angles. There are other well known propositions of great ingenuity; so that Menelaus, who must be looked on as the successor of Hipparchus and Theodorus in the school of Greek geometers who treated of the doctrine of the sphere, must also be considered as being very far beyond his predecessors.

MENES.

MENGS, ANTON RAFAEL, one of the most distinguished artists of the eighteenth century, was born at Aussig in Bohemia, in 1728. He was scarcely six years old when his father, who was himself a painter, died, and he was left to himself. He was very moderate, being determined to bring himself up to the same profession, whether he had talent or not, and adopted a course of education for him more calculated to inspire him with reverence for the art than to fit him for it. He was brought up in the most harsh and tyrannical discipline; he was compelled to employ himself in drawing the whole day long, allowing him neither recreation nor relaxation from his tasks. In course of time Rafael was instructed by his father in oil painting, and in miniature and enamelled painting, but was still taught in the same rigorous manner, and frequently received severe chastisement, if he had completed not within the time allotted him—which was generally short enough—what he had been set to do. In 1741 his father quitited Dresden, which was at that time the seat of the Elector of Saxony (active of Denmark), and went to Rome, taking young Mengs with him. On his arrival in that city, his father used to take him every morning to the Vatican, in order that he might there study the productions of Raphael, and would make him show his copies of some of the master's works. In 1744 he returned with his father to Dresden, where his talents obtained for him the notice of Augustus, who appointed him court-painter; but according to a stipulation he had previously made, he was permitted to return to Rome, and there take the degree of Master of Art. After that time Mengs stayed some time longer, he began to distinguish himself by his original compositions, among the rest by a Holy Family, in which the Virgin was painted from a beautiful peasant girl, of whom he became so enamoured, that he turned his attention to her face and marred her. After that event he again returned to Dresden, where his pension was raised to a thousand dorrors, and he was commissioned by the king to paint a large altar for a new chapel; which he wished to execute at Rome. But on his arrival there, he conceived the idea of making a copy of Raphael's 'School of Athens' for Lord Percy, afterwards Duke of Northumberland, and the Seven Years War, which caused the stoppage of his pension, interfered with the prosecution of the work. In 1757 he made his first attempt in fresco, a ceiling-piece in St. Eusebium, which was in too simple a style to satisfy the taste of that day. His 'Apollo and the Muse,' another work of the same class, The Villa Albani, obtained for him much greater renown, and is considered as not dividing even in comparison with those by the greatest Italian masters. About this time he became acquainted with Webb, to whom he communicated his ideas on art, which the latter passed off as his own. The Reminiscences of Mengs's Life and Works.

Mengs's reputation was greatly increased by the numerous works he executed for Charles III. of Spain, by whom he was invited to Madrid in 1761, and remained in that country till 1775, with the exception of an interim of three years, in the course of which he painted for the prince de' Papri at Rome. His pencil was employed in decorating the royal palaces of Spain; and the Apotheosis of Trajan, in that of Madrid, is considered his chef d'oeuvre.

After a marriage of the utmost domestic harmony, Mengs lost his wife in 1778. From that time his health began to decline, nor was it long before he followed her to the tomb; he died on the 29th of June in the following year, and was buried by her side in the church of San Michele Grande at Rome. Notwithstanding the vast sums he had received during his life, about 250,000 livres, instead of amassing money he left scarcely sufficient to defray the expenses of his funeral; but the king of Spain bestowed pensions on his family; and provided also for his five daughters. Although Mengs was known as an artist of the first rank, so high as in the last century, he undoubtedly possessed many excellences, and, compared with his immediate contemporaries, deserved the applause showered upon him. He found taste, for it is evident that he never succeeded in the matter of idealism beyond his predecessors.

MENIN, or MEENEN, a fortified town in West Flanders, situated on the left bank of the river Lys, by which it is separated from France. It is 11 miles north from Lille, and 30 miles south from Bruges; in 50° 40' N. lat. and 3° 12' E. long.

Menin contains manufactures of linen, lace, and soap, besides many breweries, salt-refineries, and oil-mills. It also carries on a considerable trade in horses, cattle, sheep, corn, and tobacco, with a population of 7900 inhabitants.

MENISCUS. [Lens.]

MENISPERMA/CHE/BA are an important and extensive natural order of Exogenous plants, considered by some to be Polypetalous, and referred to De Candolle's Thalamiflorae subclass; but chiefly a collection of those plants which have an opposite, or, at most, a few parallel, leaves, and which do not show the calyx, and of the same number, or much more numerous. The carpels are in most cases three, or some multiple of that number, either distinct from each other or consolidated. The fruit consists of succulent one-celled drupes, with a single hard, indurated seed, and a horse-shoe-shaped embryo, with thin flat cotyledons.

The wood of the stem is arranged essentially upon the Exogenous plan, but has some striking peculiarities. According to M. Decaisne, it has no annual concentric layers. The woody plates are always small and similar to one another, and are joined together girdlerwise, similarly, as in other Dicotyledons, but increase each year by the formation of a new woody layer outside the former and inside the liber. The latter ceases to grow after the first two or three years of its growth. In Cuscuta, and in certain species of Crotalaria, a flat plate, like the first in appearance, but having no spiral veins or liber, show themselves, at the end of several years, on the outside of the first, and round about them a concentric
MEN 96  MEN

eame forward as a religious teacher was unimpeachable; and he was possessed of considerable genius, some learning, and a peculiar force of character. His doctrines were free from the anti-social and licentious tenets and the pretensions to inspiration which are ascribed to the Anabaptists; but he agreed with them in condemning the baptism of infants, and in expecting a personal reign of Christ on earth for a thousand years, at the Millennium, in excluding magic from the Christian church, and in maintaining that all war was unlawful, that the taking of oaths was prohibited by Christ, and that human science is useless and pernicious to a Christian. From these tenets, and others explained and modified by Menno, as to differ very little from the doctrines generally held by the reformed churches. He insisted upon the strictest attention to moral duties, and exercised a most severe discipline upon offenders.

The followers of Menno very soon split into two sects, the Flemings and the Waterlandians, so called from the countries in which they arose. The latter somewhat relaxed the severe discipline of Menno towards offending members, which the former maintained in all its rigour. The Flemings divided again, on the subject of the treatment of excommunicated persons, into Flandrians and Frieslanders, and there also arose a third division called Germans. In process of time the greater part of these sects joined the Waterlandians.

The Mennonites put forth several confessions in the seventeenth century, the earliest of which is one drawn up by the Waterlandians. By these confessions it appears that their doctrines were nearly the same with those mentioned above as held by Menno. According to Mosheim, the fundamental principle was that 'the kingdom which Christ established upon earth is a visible church or community, into which the holy and the just are alone to be admitted, and which is consequently exempt from all those institutions and rules of discipline that have been invented by human wisdom for the correction and reformation of the wicked.'

In the seventeenth century the Mennonites obtained toleration in Holland, Germany, and England. In the year 1630, a considerable part of them arranged a conference in a conference at Amsterdam, and formed a union, which was renewed in 1649.

Further information respecting this sect may be found in Herman Schuy's Historie der mennonitischen predikanten der Nederlanden, which is a defence of the Mennonites, and in which the author protests against their being confounded with the Anabaptists; and also in Mosheim's Eccles. Hist., cent. xv., sect. iii., part ii., c. 3; and cent. xvi, sect. ii., part i., in which the history of this sect is in a greater candour.

MENONHANCS [N.B. No.]

MENOPUA [SALAMANDERS]

MENORCA, or MINORCA, is the second in size ('the minor') of the Balearic Islands. It is situated in the Mediterranean, off the eastern coast of Spain, between 39° 47' and 40° 50' N. lat., and between 3° 50' and 4° 43' E. long. It lies 24 miles to the east-north-east of Mallorca, about 125 miles south-east of the coast of Cataluña, 162 miles east by south from the mouth of the Ebro, the nearest part of Valencia, and about 190 miles north from the territory of Algiers in Africa. It has a circumference of 62 miles, and an area of about 300 square miles. In form it is irregular; being in length 33 miles, and in the broadest part 13 miles. The coast is indented on every side with small bays or deep creeks, and is surrounded with islets, rocks, and shoals.

Menorca was successively possessed by the Phoenicians, Carthaginians, Romans, Vandals, and Arabs. On the conquest of Majorca in A.D. 1229, by Don James of Aragon, the island was known as the Conqueror, Menorca, which was still held by the Moors, became tributary to that prince. In A.D. 1272, the island was conquered by Alfonso, grandson of Don James, the conqueror, who banished or enslaved the Moorish inhabitants. In the time of Charles V., it was partly seized, but soon evacuated, by Barbarossa. It remained subject to the crown of Spain till the year 1766, when the ears of Stanhope, with 5000 British troops, attacked Mahon. The island was taken by Sir Stephen Knollys, and the town and the papers threatening the garrison with labour in the names unless they immediately surrendered, he induced them to capitulate. The conquest of the island followed that of its capital, and was confirmed by the treaty of Utrecht: the English retained possession of Menorca till the year 1756, when...
Mahan was attacked by the French under Marshal de Riche-les, and Admiral Byng having failed in relieving it, the island fell into the hands of the Spaniards, with whom it was restored to the English, from whom it was wrested by the Spaniards in 1782; it was retaken in 1788, and finally ceded to Spain at the peace of Amiens in 1802.

The snows of the year are generally clear, mild, and temperate; the sunsets are usually intensely hot; the autumn is the season of the annual rains, which are exceedingly heavy; the winter is occasionally, though snow and ice are rare. On the whole the climate is less agreeable than healthy; the heat of summer and the summer heat more oppressive, which arises from the comparatively level character of Menorca. The only eminence deserving the name of mountain is Monte Toro in the centre of the island, the greater part of which is unsheltered from the western branch of the Gulf of Lions, while the heights of summer are untempered by mountain breezes. The surface of the country is a gently undulating plain, rocky and barren, or partially clothed with wild olives and corn. The southern shore is the most level. The soil is for the most part poor and sandy; that on the slopes is much richer than that of the low grounds.

The mineral productions of Menorca are limestone, freestone, marble of various colours (little used however by the natives), slate, of which a quarry is worked at Cape Mola on the east side of the island, gypsum, used for cement, and potters' clay. There are a few lead-mines, very unimportant, and iron ore is found in small quantities.

The productions of the island are of various kinds; that of Mallorca, though it is much less abundant, and the trees seldom attain to so large a size. Aromatic plants and herbs, many with medicinal qualities, grow in profusion. Wheat, barley, and a little corn are cultivated, though not enough for the consumption of the island; they return on an average six or seven for one. Olive-trees grow almost without culture; little oil is made from their fruit, which is generally preserved for eating. Vines are plentiful, and produce both white and red wine abundant. Lemons, mandarins, wild oranges, lemons, pomegranates, figs, apples, pears, and almonds; the melons are of superior flavour. Date-palms will grow in sheltered spots, but yield no fruit. Capers grow spontaneously in alley, and a little more are cultivated, though not enough. The exports are wines, wool, cheese, salt, honey, and wax. The possession of Menorca by the English during the last century did much to promote its trade and commerce; a spirit of activity and enterprise was awakened, and the natives, besides engaging in mercantile pursuits, fitted out vessels as privateers, and enriched themselves at the expense of France and Spain. But since the island has reverted to the Spaniards, trade and commerce have greatly declined. The ports of Mahon and Ciutadella are the only ones of importance. Mahon, the capital, is the most populous town and the seat of the government. Mahon is about 35,000, of which the terminus of Ciutadella consists of 12,000, of Mahon 19,000, of Allyar 4000, and of Ferreries and Mercadal 4000. Ciutadella, the present metropolis of Menorca, is situated on the north-west coast, on a small port, shallow and difficult of entrance. The city is fortified, and its walls are partly of Moorish, partly Spanish origin. Its population is about 4000. The streets are narrow, crooked, and wretchedly paved; many of the houses are neat, and some handsome. A cathedral, two parish churches, several convents, an hospital, a barracks, with a garrison, and a house, are the principal buildings. Ciutadella, though the residence of the captain-general, the bishop, and the nobility of Menorca, is inferior in importance to Mahon, or Port Mahon, on the opposite coast.

Menorca is an object of contention among the maritime nations of Europe during the past century. In the harbour are four rocky forts; on one stands an hospital, on another a quarantine establishment, on a third a large arsenal with naval storeshouses—all erected by the English. At a short distance from Mahon stood Fort St. Philip, famed in the military annals of the last century, and once a galleon brig. It is now a heap of ruins, having been blown up by the Spaniards in 1803, to prevent its being used by the English, in case they should again seize the island.

The other ports of Menorca are, Fornells, a well sheltered bay, capable of holding a large fleet, and Adaya, a small harbour, full of rocks and shoals, and only entered by fishing-craft.

Allyar, Mercadal, and Ferreries, the other district-capitales of Menorca, are little more than villages, and contain nothing worthy of notice.

Monte Toro is in the form of a cone, with a flat summit, which is occupied by an Augustin convent, to which pilgrimages are often made by the natives who have feet. Mount St. Agatha, the eminence next in importance, is supposed to have been a military post in the time of the Romans, and traces of a Moorish fortification are still visible on its summit. Two miles south of Ciutadella is a curious tower, called 'Cova Forrella,' in the midst of a full of and a garrison; and in the same vicinity is another cavern containing a pool or lake of salt-water.

Menorca is not rich in antiquities. About two miles from Allyar is a rude pyramidal ruin of Druidical character, described to the Phoenicians, the earliest colonists of the island; but whether it be temple, tomb, or watch-tower is yet disputed. Punic, Greek, Roman, Gothic, and Arab coins have been discovered; together with small statues of bronze, vases, lamps, urns, &c., chiefly of Roman origin.

In character and manners, the Mallorquines resemble the natives of Mallorca. They are equally attached to their native soil, and to their customs and religion, but they are less indolent and more enterprising. Like the Mallorquines of the interior, they are, at once, industrious and thrifty, yet essentially mild and peaceable. The same dress and language are common to both.
metrical tables. By the length of a line we mean the number of linear units contained in it, and by its square and cube the number of units multiplied by itself once and twice. The measurement of lengths and directions resolves itself for the most part into the determination of a side or angle of a triangle, when other sides or angles are given. The triangle may be either on a plane or on a sphere; but we refer the latter to Spherical, since the use of spherical trigonometry can only be well explained in connection with astronomy. Let a, b, c be the sides of a triangle, and A, B, and C the opposite angles. If the triangle be right angled at C, we have the following formulae:—

\[ \begin{align*}
    a &= c \cos A = b \cos B = b \tan A = a \cot B \\
    b &= a \cos B = c \cos A = c \tan A = b \cot A \\
    c &= \sqrt{(a^2+b^2)} = a \sin B = c \sin A = a \cot B
\end{align*} \]

or \[ a \cdot b \cdot c = 2\sqrt{(s-a)(s-b)(s-c)} \]

Segments of c made by perpendicular C from

Adjacent to a, \[ \frac{a^2+c^2-b^2}{2c} \]
Adjacent to b, \[ \frac{a^2+b^2-c^2}{2a} \]

Segments of c, by line bisecting C,

 Adjacent to a, \[ \frac{a^2+c^2-b^2}{2c} \]
Adjacent to b, \[ \frac{a^2+b^2-c^2}{2a} \]

Line bisecting \( C = \frac{a+b}{2} \)

The area of a rectangle (in square units), and that of a parallelogram, is the product of the units in the base and perpendicular distance of the opposite sides. But if two sides only be parallelogram, half the sum of the parallelogram is, and when the other sides are given, the area may be multiplied by the perpendicular distance between them. In other cases, the figure must be measured by dividing it into triangles, except when it is either a four-sided figure capable of inscribing a circle, or a regular polygon. Every triangle is half of the rectangle obtained by any one of its sides, and the perpendicular let fall from the opposite vertex.

If a, b, c, and \( \theta \) be the sides of a four-sided figure inscribed in a circle, and \( \theta \) their half-circle, the area is

\[ \frac{a \cdot b \cdot c \cdot \sin \theta}{4} \]

If a be one of the sides of a regular polygon of \( n \) sides, the area of the figure and the diameters of the circumscribed and inscribed circles are

\[ \frac{n \cdot a^2}{4 \cdot \cot \left( \frac{180^\circ}{n} \right)} \quad \text{and} \quad \frac{n \cdot a}{\tan \left( \frac{180^\circ}{n} \right)} \]

Tables connected with this subject are given in the article POLYGONS, REGULAR, and corresponding tables for the solids in SOLIDS, REGULAR. For the method of measuring irregular areas, see QUADRATURE, METHOD OF.

The whole of the measurement of the circle depends upon the ratio of the circumference to the diameter, which is called \( \pi \), and is \( 3 \cdot 1415927 \) nearly, or \( \sqrt{10} \) roughly, or \( \frac{22}{7} \) very nearly. [ANGLES] Some simple derivations from this number are practically useful, that we shall give a table of them, accompanied by their logarithms, first giving a method of multiplying and dividing by \( \pi \), which is a correction of the use of \( \sqrt{10} \). To multiply by \( \pi \), multiply by 22 and divide by 7; from the result take one eighth of the hundredth part of the multiplicand as a correction; the result is too great only by about its 200,000th part. To divide by \( \pi \), multiply by 7, divide by 11, and to the result add the eighth part of the thousandth part of the dividend; the result is too small by very nearly its 100,000th part.

The table just referred to is as follows:—

<table>
<thead>
<tr>
<th>Number</th>
<th>Logarithm</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 \cdot 1415927</td>
<td>0 \cdot 4971499</td>
</tr>
<tr>
<td>22</td>
<td>0 \cdot 0196119</td>
</tr>
<tr>
<td>7</td>
<td>0 \cdot 0989589</td>
</tr>
<tr>
<td>11</td>
<td>0 \cdot 0959405</td>
</tr>
<tr>
<td>100</td>
<td>0 \cdot 0389789</td>
</tr>
<tr>
<td>1000</td>
<td>0 \cdot 0079179</td>
</tr>
</tbody>
</table>

The phenomenon of the circumference from the diameter, multiply by \( \pi \); to find the diameter from the circumference, multiply by \( \frac{1}{\pi} \); to find the area from the diameter, multiply the square of the diameter by \( \pi \); to find the area from the radius, multiply the square of the radius by \( \pi \); to find the diameter from the area, multiply the square root of the area by \( \sqrt{\frac{1}{\pi}} \); to find the area from the circumference.
multiply the square of the circumference by $\pi$; to find the circumference from the area, multiply twice the square root of the area by $\pi$; to find the diameter, multiply the square root of the area by $\pi$; the angle at the diameter, the square root of the area by $\pi$; the angle at the circumference, the square root of the area by $\pi$; the secant of the angle at the diameter, the square root of the area by $\pi$; the secant of the angle at the circumference, the square root of the area by $\pi$.

The arc of a circle and its subtended central angle are connected as follows: the arc which is equal to the radius subtends an angle of $57^\circ$3-3 very nearly; or it may be easily remembered as $57$ degrees and three-tenths of a degree, divided by the radius; and the angle subtended by a chord of a circle is $\frac{n}{2}$ of a second; being $57^\circ$17'44"8, or 206264'78. To find an angle from its area, find the square root of the area by $\pi$; and divide by the radius; the result is too great by about three-quarters of a 10,000th part, and is in degrees and decimals of a degree. To find the arc from the area, divide the angle into degrees and decimals, multiply by the radius, and divide by $57^\circ$3; the result is now too small by about three-quarters of its 10,000th part.

To find the area of a sector, the area of the arc (if only the angle is given), and multiply it by half the radius. To find the area of a segment contained between an arc and a chord, find the sector, and find the radius of the circle by the equation $r = \frac{2a}{\sin c}$, where $a$ is the chord of the segment, and $c$ is the central angle of the segment.

The number of cubic units in the content of a rectangular solid (or parallelepiped) is the product of the number of units in its three adjacent sides. The content of a rectangular prism is equal to the product of the number of units in its base and the number of linear units in its altitude. The content of a prism or pyramid must be found by computing those of its base and altitude. If the base and altitude are known, the content of the prism is found by multiplying the base by the altitude. If the content and base are known, the altitude is found by dividing the content by the base.

The following formula relate to the sphere. To find the surface from the radius, multiply the square of the radius by $4\pi$, or the square of the diameter by $\pi$; to find the content from the radius, multiply the cube of the radius by $\frac{4}{3}\pi$; to find the radius from the surface, multiply the square root of the surface by $\sqrt{\frac{1}{4\pi}}$; to find the diameter, multiply the cube root of the content by $\sqrt[3]{\pi}$; to find the content from the surface, multiply the square root of the cube of the surface by $\frac{4}{3}\pi$. [SYNERE]

In the preceding, the figures on the different subjects may be consulted; and Hutton's or Dunn's castle's elementary works on mensuration.

MENTHA PIPERIT A (Peppermint), a plant common in many parts of Britain, but cultivated for medicinal purposes. The fresh leaves are much more fragrant than the fresh, or of a lively green, with a peculiar aromatic odour, and a pleasant camphor-like taste, at first burning, but at last causing an enduring sensation of cold in the mouth. The dried herb is used as a substitute for oil of peppermint, which is more aromatic and bitter. A tea made of the leaves is useful in cases of indigestion. It is often adulterated with oil of turpentine, oil of marjoram, and absolute alcohol. When pure it is of a whiter yellow, yellow, or even green colour; odour very strong, taste burning, camphor-like, having a sense of coldness in the mouth. The oil is at first limpid, but becomes thicker, like a fixed oil. European oil does not resemble the above, but it is a strong, four-sided prism, which possesses the colour of the oil. The American oil is more soluble in alcohol than the German; specific gravity 0.99, but when rectified 0.90. The action on the human system of any of the preparations of mint is stimulating and relaxant, but the American may be added to drastic or gripping purgatives, and in other cases. It proved of considerable utility in bringing about reaction in the collapsed stage of Asiatic cholera.

MENTHA PULEGRIUM (Pennyroyal), an indigenous species of mint, smaller than the above, which makes 0.01 of the whole herb, except the root, is official. The oil is strong and peculiarly aromatic; taste herbaceous and bitt'ner. It has a stimulant and antispasmodic property, similar to that of the piperita, but is supposed to possess also a specific power over the uterus, which has been much over-estimated. A distilled water, a spirit, and volatile oil are prepared from it, as from the preceding species.

MENTHA VIRIDIS (Spearmint), a plant of Britain, very much resembling M. piperita, but the colour however is of a deep green. It is also frequently confounded with M. crispa, than which it has a stronger and more agreeable odour, but weaker than peppermint. It has not the aromatic odour of M. piperita, nor does it leave the sensation of coolness in the mouth. From it are prepared a distilled water, a spirit, and a volatile oil, which are used as the former.

MENTZ. [Maine.]
MENU. [Maine.]
MENURÀ. [Mentara.]
MENYANTHES TRIFOLIATA (official part, the leaves), a plant common in our bogs, and hence called bogbean, as its leaves resemble the common bean. The leaves are terete, petiolate, and even when dried have a fine green colour, but are without odour; they possess an enduring bitter taste. One hundred parts of the fresh herb dry into thirty-nine; ten pounds of the dried plant yield two pounds of oil. It contains a strong and very extractive M. trifoliata, which Brandes says forms a fibre, tense, and, when highly dried, pulverisable mass of an intense degree of bitterness. Troommendorff says he obtained a yellowish brown, clear, very viscous, not pulverizable, bitter extract.

It is a tonic and febrifuge medicine of undoubted efficacy, but greatly neglected in the treatment of disease. The chief use said to be made of the large quantity annually collected is to substitute it for hops in brewing; a proceeding which is both invalid and deleterious. Though bitter, it does not possess the aromatic quality of the hop.

MENZ’ALEH, LAKE. [E'UX.]
MENZIKOFF, PRINCE. [FATHER THE GREAT.]
MEPHITIC [BENTZEN, vol. iii., p. 298; SKUNK.]
MEPHITIC AIR. [Carbonic Acid.]
MEQUIZINE. [MAROCO.]
NER. [LOIR ET CHER.]
MERCACTAN, A compound of hydrogencarbon, and sulphur, discovered by ZEISE, and so called from its energetic action on binoxide of mercury (corpus mercurium capsans). It is prepared by distilling a mixture of sulphotannate of barytes and a strong solution of protosulphate of barium. A volatile liquid and water pass over into the receiver, while sulphate of barytes remains in the retort; the ethereal product floats on the water, and when removed and carefully distilled, it separates into tonic ether and mercurian, the properties of which are, that it is a colourless liquid, has a penetrating slight smell, and a peculiar sweetish taste; its specific gravity is 0.942, it boils at 144°, and remains fluid at 0°. Water dissolves it sparingly, but ether and alcohol unite with it in all proportions; it has no action on white paper. At 70° Fahrenheit, it gives a plentiful yellow colour in the solutions of mercaptan. When added to binoxide of mercury, energetic action ensues, water is generated, and a colourless crystalline compound is formed; with bichloride of mercury a similar product is obtained, attributed to the formation of hydrochloric acid.

According to Zeise, the ultimate composition of mercaptan is—
Six equivalents of hydrogen 6
Four equivalents of carbon 24
Two equivalents of sulphur 32

Equivalent 40

He however considers it as a hydrosulf of a compound base which he calls mercaprocum, and consists of six equivalents of hydrogen 6, four equivalents of carbon 24, and two equivalents of sulphur 32 = 61.

When mercaptan is made to act upon potassium, mercupside of potassium is formed, and one equivalent of hydrogen is given out; the constitution of the base of mercaprocum and mercaptan is analogous to that of cyanogen and hydrocyanic acid.

MERCATOR, GERARD (whose real name was Kauffmann, of which Mercator is the Latin equivalent), was born at Alzeymonde in East Flanders, in the year 1512. He applied himself with great industry to the sciences of geography and mathematics, and was patronised by the emperor Charles V., and appointed, in 1559, cosmographer to the duke of Juliers. He gave his name to the method of geographical projection now usually employed in the construction of nautical maps, in consequence of his having first represented the meridians by equidistant parallel lines, and the parallels of latitude by straight lines at right angles to the meridian, but he did not know the science which ought to separate these parallels. Nicholas Mercator is said to have discovered the law which regulates these distances; but the English mathematicians having refused to pay for the promulgation of his discovery by accepting a pecuniary challenge, he is said to have been murdered by them, he died without communicating it even to his friends.

The credit of first investigating the principles of that projection, and applying them to the purposes of navigation, appears to be due to Edward Wright. Gerard Mercator died at Doesburg, Dec. 2, 1594. His published works are entitled: De Usu Annuli Astronomici, 1556; Chronologia, Cologne, 1668, fol.; Tabula Geographicae, Cologn, 1578, fol.; Harmonia Evangelistarum, Doesburg, 1592, 4to; Chirurgia, collected in 4to, in 1544; and another edition was published in 1623, containing 156 maps.

(Hutton's Mathematical Dictionary; Montucla, Histoire des Mathématiques; Robertson's Dissertation on the Rise and Progress of Astronomy.)

MERCATOR, NICHOLAS (whose real name was Nicholas Kauffmann), was born at Holstein, in Denmark, in 1640. At an early age he was engaged in a correspondence with some of the greatest mathematicians in Germany, Italy, and England. In 1660 he came to England; and shortly after the formation of the Royal Society, he was elected a member of that body. The date of his death is uncertain. According to Dr. Hutton, it took place in England in the year 1690 (Mathematical Tracts; see Dictionary); but, according to Weise (Biog. Universel), he died at Paris, February, 1687. The reputation of Mercator rests principally upon a method, of which he was the author, whereby the areas of the spaces comprised between the hyperbolas and their asymptotes may be determined arithmetically to any degree of approximation required; and upon the application of this method to the construction of logarithmic tables. It had been shown, as early as the year 1647, by Gregory St. Vincent, and subsequently by Mercenne, that, if such spaces could be computed, would give the logarithms of the corresponding abscissae measured along the asymptote. [Logarithms] It was also known that in the equilateral hyperbola whose semi-axis is =2, the relation between the ordinate and abscissa was expressed by the equation y = 1 1+x; and Wallis had shown in his Arithmetica Infinitorum, published in 1655, that if the equation of a curve be represented by y = 1 + x + x² + x³ + · · ·, its area would be correctly expressed by the infinite series x + x² + x³ + · · ·. Wallis however, although his attention had been particularly directed to the subject, did not observe the almost obvious analogy between the equations y = 1 + x + x² + · · ·, and y =

1 1+x as he could not have failed to do, had he been proposed to do the simple division indicated by the fraction 1 1+x for he would then have seen that the latter equation was identical with y = 1 — x + x² — x³ + · · ·, &c. Mercator performed this division, and moreover describes the several steps of the operation with such minuteness, that one might almost suppose it to have been the first operation of the kind that had ever been either proposed or performed. He determined the required area, by considering it made up of a number of ordinates very near to each other, which method Kepler had previously employed in approximating to the area of a sphere's orbit, and in this way he came to infer that the area corresponding to the abscissa 1 + x, that is, the hyperbolic logarithm of 1 + x, was x — x² + x³ — · · ·, &c.

These investigations were published by Mercator in 1644, in a work entitled Logarithmotechnia, sive methodusconstruendi logarithmos nova, accurata et facilis, 4to, London. Wallis, who soon improved upon this method, says, in speaking of the work in a letter addressed to Lord Viscount Bruncker; 'With this book, which has just appeared, I was so much pleased, that I could not quit it until I had completed its perusal. The doctrine by which the logarithms may be expeditiously constructed is perspicuously and ingeniously set forth; and the distance of the point of approach, or vulg., has been made plain to the reader. Mercator has been charged with dition proprieto discovering the log. of others, and with meanly withholding the publication of some which really belonged to him. [Mercator, Gerard.] In the Philosophical Transactions of 1679 and 1689, we have several communications on considerations concerning the Geometric and Direct Method of Signior Cassini for finding the Apogees, Excentricities, and Anomelies of the Planets, besides which he has left the following works:—Cosmographia, Danzig, 1651, 12mo; Collectanei Mathematica sub inscriptionibus, Elbinge, 1668, 4to; De Emendatione Annuus distributae, quibus exponuntur et demonstrantur Cyclo Solis et Lunae, 4to; Hypothesis Astrograficae nova et consensus ejus cum observationibus, Halle, 1660, 4to; Collectanea Mathematica, 1668, 4to, in 1676; Natura libri duo, Lond.; 1676, 8vo; Euclidis Elementa Geometrica, Lond., 1678, 12mo.

MERCATOR'S PROJECTION. It is our object in this article to endeavour to describe the projection, the use of which constitutes the principal difference between the methods of travelling by land and by sea, in such a manner as rather to give information to the landsman than to the seaman, who, instead of a point of reference, has a whole map of the earth to carry about with him. Mercator's projection is based on the consideration that the equator of the earth and the plane of the equator are perpendicular to each other, and that the meridian and the plane of the equator are also perpendicular to each other. The meridians are represented by straight lines, and the parallels of latitude by straight lines parallel to each other. The result of this projection is that the scale is not uniform, but increases with the distance from the equator. This is a disadvantage, since the earth is not a perfect sphere, and the scale should be uniform. However, Mercator's projection has been widely adopted because it is simple and easy to use, and it is still used today in many applications, such as navigation and cartography.

A ship thus circumstanced, if it should continue sailing due north, would in time reach the north pole on a meridian circle of the sphere, on which, if it still kept its course, it would proceed due south, and would at last reach the south pole; such a ship would never change its longitude, except at the moment of passing either pole, when the longitude would alter at once by 180 degrees. If however the vessel sailed continually due east or due west, it would sail upon a small circle of the sphere, being always at the same distance from the poles, and always in the same latitude. In the first case the differences of latitude would give the distances sailed over, at the rate of 60 nautical miles to a degree; in the second case, the differences of longitude, reduced in the manner above, would give the result, and so, always by the cosine of the latitude, would serve the same purpose. But suppose that the vessel took an intermediate course, say north-east. It would not sail on any circle of the sphere, great or small; for by hypothesis the line of the course as always making an angle of 45 degrees with the meridian, and there is no circle (unless it be the meridian itself, or a parallel of latitude, the equator included) which always makes the same angle with the meridian. Neither could the vessel, keeping such a course, reach the pole; for at the moment when it touches the pole, it is sailing north.
whereas by hypothesis it is always sailing north-east. The fact is, that a curve which makes equal angles with all meridians must be a spiral which approaches the pole, encircling it with an infinite number of folds, but never actually reaching it, as in the following diagram, in which the curve 1, 2, 3, 4, 5, &c., is that on which a ship would sail from 1 towards the north pole on a course east-north-east, and the curve 1, 5, 6, 7, 8, &c., is that of a course west-south-west towards the south pole. The dotted part of the figure is supposed to be on the other, or the invisible, side of the sphere. A ship sailing from A to B over A C B, keeps one course; but were it to sail over the great circle A D B, the course must be perpetually altering.

The spiral A C B is the only one on which a ship should sail directly from A to B, though there is an infinite number of such curves which pass through both A and B, the reason being, that in every other spiral except A B one or more complete circuits in longitude must be made, and the ship would come again to the meridian passing through A before it reaches B. In the same manner a spiral might be found, passing through A and B, which cuts the meridian of A five hundred times before it passes through B. Of course the shortest course is always preferred; and it is the object of Mercator's projection to lay down such a map of the world that the straight line joining two points shall be the map of the course which must be followed in order to sail from one to the other in the most direct manner, consistently with always keeping the same point of the compass.

The spirals above described are called loxodromic spirals, or rhumb lines, and under the latter term their mathematical properties are explained. Our present object is to turn the globe into one of Mercator's maps, in a manner which will give the unmathematical reader some idea of its construction. For this purpose suppose the map of the world to be painted on the globe, and let the globe be made of a thin and very elastic material. Let the elasticity of this material increase as we go towards either pole, and so rapidly that it becomes as great as we please at and near the poles. Let the equator E Q be immoveably connected with the internal centre (supposed fixed) of the globe. If then the north and south poles be pulled away from the equator, the thin membrane of the sphere will be extended; and if the pull be continued until the poles are sufficiently distant, a large portion of the sphere on each side of the equator will assume a cylindrical form, or one nearly cylindrical; and the greater elasticity of the upper parts will cause the small folds of the different spirals to be much more extended than the larger ones, so as to become equal to them. Let the mathematical hypothesis implied in the preceding be carried to its extreme limit, that is, let the poles be pulled to an infinite distance; and let the law of the elasticity be such that the several loxodromic spirals shall have precisely similar successive folds on the resulting cylinder, that is, let them take a regular screw-like form. The meridians will then all become straight lines parallel to one another; and if the membrane be then fixed in its cylindrical shape, that is, if it lose its elasticity, and if one of the meridians be slit all the way down, and the cylinder unrolled into a plane, we shall have before us Mercator's projection, as shown in the following diagram. The degrees of longitude remain everywhere the same, those of latitude increase sensibly. The map goes up to 80° of latitude, and any part of the remaining 10° might be drawn; but no space would be sufficient for the whole of the remainder. Any two points, A and B, being given, the line A B joining them points out, on the supposition that all the meridians look towards the north, the most direct course on which a ship can sail from one to the other: if a compass were placed
At A, then A B would show, A K being the north direction, the point of the compass on which to steer. Again, from C to D the most direct course is on the dark line C D; but C E, D, is another way of coming at the same point. It must be remembered that the extreme lines on the right and left represent the same meridian, as they coincided before the cylinder was divided for the purpose of being unrolled. It thus appears that we have a map on which the sailing compass is arranged in the simplest form that can be drawn by a right line. Another advantage, depending upon the nature of the rhumb line however, and not on the projection, is the simplicity of the rule by which the distance sailed can be determined. This is pointed out in Rhumbs-Lines. The principle on which Mercator's projection of the whole 360 degrees of longitude up to 80 degrees of latitude is based is so simple that it is easy to understand.

MERCENARIA, Schumacher’s name for the Venus mercenaria of authors, which passes current as money, under the name of Wampus, among the Indians of North America. [VENERIDE]

MERCIA. [ENGLAND]

MERCURY, or QUICKSILVER. This metal, which possesses the remarkable property of being fluid at usual temperatures, has been known from the remotest ages. Although it is met with in very large quantity, yet the mines occur in comparatively few places; those of Almaden in Spain, and Cerro de Pascoal in Brazil, that being the name it is known by in Brazil. There are, however, mines of this metal in Hungary, Transylvania, and the district of Deux Ponts in Germany. Mercury has been found for a very long time in China and Japan, and in the amount of the profusion of the movement, there is every reason to think it is considerable; it is also found at Huancavelica in Peru.

Mercury is always obtained from cinnabar, which is a bisulphuret of the metal; it is found in the red-sandstone associated with coal, and in the cinnabar in the subordinates porphyries; and at Idria it is found in the subordinates bituminous schist, but rarely in limestone itself.

The cinnabar which is found in coal-sandstone is often associated with coal-bearing argillaceous and bituminous schist, and imprinted with flaxes and plants; often with combustible fossils, and sometimes even intimately mixed with coal.

Pliny states (xxxiii. 7) that Callias, an Athenian, discovered the preparation of vermilion, or cinnabar, B.C. 505. He also mentions the mines of Almaden [ALMA DEN] as producing in his time 10,000 Roman pounds annually; but this was not the amount which the mines could have produced, for the supply was purposely limited. Le Play, a French geologist, who visited Almaden in 1833, describes the mines as being richer than at any former period, furnishing annually nearly 2,244,000 pounds of mercury. About 700 workmen are employed underground, and 200 in the operations connected with the extraction of the metal from the ores of silver.

Formerly mercury was imported in packages of fifty or sixty pounds weight; the metal was poured into a fresh sheep-skin, from which the wool was taken off, the ends were tied tight, and the bag thus made was encased in a second skin, and that in a third, and three or four layers were packed in large barrels. Of late years mercury has been brought to this country in wrought-iron bottles.

Various processes are adopted for the purpose of separation. One of the most of which depend upon the volatility of the metal, its conversion into vapour in distilling vessels or retorts, and its condensation by cold. In order to separate the sulphur from the metal, either iron or lime may be employed; the first forms sulphide of iron, and the latter of palatinite, with the sulphur, and the metal is thus set free, volatilized, and condensed. The retorts employed for this purpose are of cast or sheet iron, or earthenware.

According to Dumas the following mines yield annually the annexed number of quintals of mercury (a quintal is 108 lb. of pure metal):—

- **Almaden** 25,000 to 32,000
- **Idria** 6,000 10,000
- **Hungary** 700 700
- **Transylvania** Deux Ponts 400 500
- **Palatinate** 180 200
- **Huancavelica** 3,000 3,000

Total: 33,200 46,400

We may perhaps reckon the average at about 2000 tons.

The properties of mercury are, that it is fluid, of a silvery white colour, and possesses a high degree of lustre; it is inodorous, tasteless, unacted upon, or very slightly by exposure to air at common temperatures, and not at all by water at any temperature. The specific gravity of mercury is about 13.656. It boils at 570°; the density of its vapour is 69.76; and yet, as shown by Priestley, it vaporises at common temperatures, and Faraday has confirmed the observation.

At 40° below zero, mercury becomes solid, crystallizes in octahedrons, and gives a dull sound like lead; at the moment of congelation it contracts considerably; for while its density at 47° is 13.545, that of frozen mercury is 13.515; when in this state it is malleable, and may be cut with a knife.

Mercury is a good conductor of electricity and of heat, but its capacity for heat is extremely small; it expands uniformly at all temperatures between its boiling and freezing points. When mercury is pure it assumes the spherical form in small portions, but when it contains other metals, it forms into long strips; a very minute admixture is sufficient to produce this effect; when thus impure it must be subjected to distillation, by which the mercury is volatilized, and the metals mixed with it remain; or it may be purified to a considerable extent from the more oxidizable metals by agitation with dilute nitric acid.

OBS. OF MERCURY.—Native Mercury.—This occurs in but few places, and is met with in small cracks or crevices of the rocks in which the common ore occurs, and is frequently accompanied by red silver.

The principal deposit is at Almaden in Spain, and Idria in Carniola; some is also met with in the Palatinate.

Chloride of Mercury (Horn Mercury; Baumiterie; Mur- rate of Mercury) occurs crystallized and in tubercular crusts. Primary form a square prism. Cleavage parallel to the lateral faces and the diagonal planes of the primary form; the latter are the more brilliant. Fracture concho- dal. Hardness 10 to 20. Readily scratched with the knife. Colour pearl grey, or yellowish grey. Lustre adamantine. Translucent. Specific gravity 4.862.

Rented to the blow-pipe, it is entirely volatilized, and it yields by analysis Chlorine 14.89
Mercury 85.11

Occurs principally at Moschelandsberg in Deux Ponts, but is also met with in Spain, Bohemia, and the Palatinate Cinnabar. Verrillon; Bisphosphes of Mercury. This is the common ore of mercury. Occurs crystallized and massive. Primary form of the crystal an acute rhomboid. Cleavage easy, parallel to the lateral faces of a regular bhedral prism. Fracture conchoideal. Hardness 2 to 2.5. Colour crimson red. Lustre adamantine, approaching metallic. Opalescent, translucent, transparent. Specific gravity 8.989.

Heated by the blow-pipe, whites a piece of copper held over it. Unacted upon by nitric or hydrochloric acid, but readily by a mixture of them.

It occurs in the places which have been mentioned; as Almaden, Idria, &c.


Analysis by Klaproth.

<table>
<thead>
<tr>
<th>Substance</th>
<th>Mercury</th>
<th>Silver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfusion</td>
<td>64</td>
<td>28.5</td>
</tr>
<tr>
<td>Almaden</td>
<td>36</td>
<td>27.5</td>
</tr>
</tbody>
</table>

100 100°


When heated by the blow-pipe, the mercury is volatilized, and the silver remains in the metallic state.

Analysis by Klaproth.

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</tbody>
</table>

100 100°
The chloroform is slowly boiled up in water, the cloudy solution is distilled, and the residue is used as the raw material for the manufacture of the chloroform in the Pharmacopoeia.

The chloroform is obtained by distillation of the alcohol in which it is dissolved, and the residue is used as the raw material for the manufacture of the chloroform in the Pharmacopoeia.

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Bromide or Protobromide of Mercury is procured by mixing solutions of bromide of potassium and protoprotinitrate of mercury; a white curdy precipitate is obtained, which is insoluble in water.

Bromide of Mercury is prepared by treating the metal with bromine and water. This salt is soluble in water, and the solution yields colourless crystals, which are dissolved by alcohol; this salt is decomposed by nitric and sulphuric acids. Neither of these salts is applied to any particular use.

**Solid Combinations—Non-metallic elementary solides and Mercury mostly combine, but—**

Carbon and Mercury do not form any compound.

Sulphur and Mercury unite in two proportions, forming the sulphur or protosulphur and the bi-sulphur or per-sulphate of mercury. When sulphur and mercury are triturated together they form a black mixture, which is used in medicine, and was formerly called Athiops mineral; this however is not a definite compound of the elements.

Protonitrate of Mercury is easily obtained by passing a current of hydrosulphuric acid gas into a solution of protobromate of mercury; a black powder is precipitated, which is insoluble in water, totally volatilized at a high temperature, and is by nitric acid converted into a sulphate. It consists of——

| Equivalent of sulphur | 16 |
| Equivalent of mercury | 202 |

**Acids and Mercury.** —The action of acids on this metal, like that which they exert on others, is various, and of course depends upon the nature of the acid and the power of the metal in attracting oxygen.

Nitric Acid and Mercury. —It is a well-known fact that concentrated nitric acid acts upon very few metals, and it is curious that although the affinity between mercury and oxygen is extremely weak, yet this metal decomposes nitric acid and attracts its oxygen, even at common temperatures: the fluidity of the metal is probably the cause of this faculty of action. A solution of permanganate of mercury is thus obtained, which, if it crystallize at all, does so with great difficulty; for the solution may be evaporated to the sp. gr. 2·9 without yielding crystals.

Protonitrate of Mercury, that is, nitrate of the protioxide, is readily obtained by adding excess of the metal to the dilute acid. Action readily takes place, and crystals are formed with great readiness. There is no protonitrate of any metal which forms so many nitrates as that of mercury; they are at present very imperfectly known, and require analysis.

The crystallized protonitrates of mercury are mostly decomposed by water, subprotionate being precipitated in an insoluble state.

It has already been observed that the pernitrate of mercury can scarcely be obtained in a crystalline form.

Hydrosulphide Acid and Mercury do not act upon each other under any circumstances; when however the protioxide is added to the acid, protochloride of mercury and water are formed; while with the binoxide of mercury water and the bichloride are procured.

Sulphuric Acid and Mercury do not act upon each other without the assistance of heat; with it, the acid is decomposed, and the metal converted into binoxide, and biperonitrate of mercury is formed.

**Biperonitrate of Mercury.** —This is procured by adding sulphuric acid to a solution to protonitrate of mercury; a white insoluble compound is precipitated, which is not applied to any use, and which consists of——

| Equivalent of sulphur acid | 40 |
| Equivalent of protonitrate of mercury | 210 |

**Biperonitrate of Mercury, obtained, as just described, by heating together the acid and metal, is a colourless salt, which, when mixed with water, is decomposed, and sulphuric acid remains in solution, while a yellow precipitate is obtained, formerly called turpeth mineral.**

The biperonitrate of mercury is composed of——

| Two equivalents of sulphur acid | 40 |
| One equivalent of biperonitrate of mercury | 210 |

**Turpeth mineral is a subphate of the binoxide of mercury, composed of—**

| Three equivalents of sulphuric acid | 120 |
| Four equivalents of binoxide of mercury | 572 |

**Biperonitrate of Mercury is not directly applied to any purpose, but the formation of it is one of the steps in the process of preparing calomel and corrosive sublimate in the Pharmacopoeia.**

Carbonate and Mercury do not, under any circumstances, act on each other. When an alkaline carbonic acid is added to a solution of protonitrate of mercury, a precipitate is obtained, which, on drying, does not contain any carbonic acid, so that a protocarbonate of mercury does not appear to be capable of being formed.

Percarbonate of Mercury may however be obtained by
mercurial salts are mostly volatilized at a red heat, and they are all decomposed, with the production of metallic mercury, when mixed with a little carbonaceous matter, and heated in a glass tube.

Uses of Mercury.—The uses of mercury in the medical profession are numerous and important. It is used in the extraction of gold and silver from their ores, in gilding (gilding), the silverying of mirrors, and in filling thermometers and barometers. Bichloride of mercury has been lately extensively used for the prevention of dry rot; and lastly this metal is extensively employed in various medicinal preparations.

Medical Properties of Mercury.—In a purely metallic state, mercury, when taken into the human stomach, produces no effects except such as are owing to its mechanical properties. Nevertheless it may become oxidized, and, by combining with some of the acids of the stomach, occasion violent disorders. Even its external application or its use in medicinal preparations is often sufficiently obvious. A brief statement of the most important of these effects is all that can be given here.

When mingled with water it is rendered difusible, or with confection of roses (which is the case when it is made into blue pills), is taken in moderate dose into the stomach, it does not seem to make any immediate sensible impression, unless that organ be in a state of morbid sensibility, when it is often acutely felt, as a rarefaction of the blood, or a diminution of the circulation of the bowels. It may be repeated at proper intervals, and the individual, especially if robust, appears only to have an increased appetite and more rapid digestion. This is particularly the case when corrosive sublimate (bichloride of mercury) is taken in minute doses. Even the introduction of mercury into the body by friction over parts where the skin is thin, would seem to increase, for a time, the activity of the whole system. To whatever surface applied, the substance appears to be gradually carried into the circulating mass. Owing to peculiarity of constitution (diosyncrasy) a very minute quantity of mercury produces in some individuals very striking effects, either violent salivation, disturbance of the bowels, or other disorders caused by great irritation of certain parts, which is quite distinct from the effects of an overdose of some of the more active forms, which produces actual poisoning, or from the effects of the too long continued administration of some of the mild preparations. Children, owing to the irritability of their bowels, are not so apt to be salivated as adults, and more mercury can be borne in warm than in cold countries.

When a single dose of mercury is given, it is generally one of the actions which act alone, or in combination with other purgatives; and little permanent effect is observed; but repeated small doses, especially if hindered from passing off by the bowels, by combination with opium, excite arterial congestion, and end by establishing a temporary effect. The pulse is full and more frequent, the animal heat augmented, the secretion from the skin abundant; at last followed by thirst, restlessness, and sleeplessness. This disturbance frequently lasts some time, even after the medicine has been discontinued; the body excretes it with determination or congestion of blood either towards the lungs, abdomen, or brain, followed sometimes by hemorrhage from various organs. Blood drawn during a mercurial course is generally clear, except for some milky fluid; and the skin shows as the action is going on, a curious inflammatory diseases. On the sary glands the effects are most conspicuous: they become irritated, more sensible, turgid, and pour out abundant
saliva, which, on standing, deposit flakes of coagulated albumen. The breath at the same time acquires a peculiar savor (called mercurial), the gums are swollen, but pale and tender, the teeth become loose, and the tongue and lining membrane of the mouth are covered with ulcers.

The general commotion of the system often gives a powerful indication in the course of many diseases, but occasionally it becomes too great, and requires to be moderated. Not only must the exhibition of the mercury be suspended for a time, in such cases, but very plethoric persons must be bled, and put to a sedative regimen before it is again used. The warm bath, dilute drinks, and a milk or farinaous diet, with cool air, are proper means of lessening the violence of its action.

The effects just mentioned show the necessity of abstaining from the use of mercury in certain diseases, especially hemorrhages (especially of the lungs), or a disposition to consumption, or if there exist a scrophulous constitution, or the person be affected with sea scurvy: also during certain states of the female system, and during pregnancy or suckling.

When the use of mercury is too long continued, or it is given in too strong doses, its stimulating action appears to fatigue the system, and to pervert the function of assimilation, both immediately in the blood, and also in the different organs of the body. Hence the muscular power, becomes pale, tumid, and puffy, or else greatly emaciated. The brain and spinal chord are irritated; the limbs exhibit involuntary tremblings, and all the tissues acquire a morbid susceptibility. The blood is found to have less of the healthy consistence, and the person appears to be affected with scurvy or consumption. The Inconsiderate use of mercurial preparations, especially of corrosive sublimate, often occasions chronic inflammation of the stomach, causing indigestion and a number of mischiefs of the costs of the stomach. Diseases of the brain not unfrequently result from an improper use of mercury. Lastly, a peculiar affection of the skin often occurs from the abuse of this substance.

Persons under the influence of mercury, even when a single dose has been taken as a purgative, are very liable to take cold, especially from wet. This must be carefully guarded against. The bichloride of mercury (or corrosive sublimate) seems not to dispose the system so much to be hurtfully affected by cold, and is therefore well suited to camp and navy practice. Besides, if given in sufficiently small doses, it is perhaps the best of all the preparations to use as an alternative, especially in cases of chronic inflammation or thickening of the tissues, such as the heart.

Mercury is employed in the deposition of coagulable lymph, and controlling changes in the organic particles of bodies, both vegetable and animal. One of the most valuable uses of mercury is connected with this power of changing the action of the capillaries when that action is too free, and too rapid to be of use to the body in excessive, or effuse coagulable lymph. In some infirmities the action of the vessels is so violent as to pour out their contents, and this leads to obstructions or changes of structure which derange the functions, or even speedily occasion in frequent relatively exposed does (as in the case of the windpipe, obstructing respiration; in peritonitis, or inflammation of the outer lining of the intestines, lymph is poured out, agglutinating the folds of the intestines, in iritis the same happens, closing the pupil of the eye and destroying vision. Hence it is employed with effect when, without it, calomel given very freely will hinder further erosion, and even cause the absorption of what has already escaped from the vessels; as may often be seen when the iris of the eye begins to flow with blood. Many serious chronic diseases are removed by a judicious and persevering use of mercury, but these can neither be enumerated here, nor can even the most general rules be attempted to be laid down. (Holland, Medical Notes; On Mercury Medicines; and Treatise On Nervous Diseases.)

The specific employment of mercury is still less suitable to be discussed here. It may be remarked however that the opinion for the necessity of giving mercury in any quantity is now altogether exploded. It is not to be used in many of the other preparations of mercury, many of which are valuable, either alone or as additions to other substances. Colonel sufficiently greatly assists in promoting the action of other medicines, particularly diuretic medications. How far calomel, either in small frequently repeated doses (as in various parts of the windpipe, obstructing respiration; in peritonitis, or inflammation of the outer lining of the intestines, lymph is poured out, agglutinating the folds of the intestines, in iritis the same happens, closing the pupil of the eye and destroying vision. Hence it is employed with effect when, without it, calomel given very freely will hinder further erosion, and even cause the absorption of what has already escaped from the vessels; as may often be seen when the iris of the eye begins to flow with blood. Many serious chronic diseases are removed by a judicious and persevering use of mercury, but these can neither be enumerated here, nor can even the most general rules be attempted to be laid down. (Holland, Medical Notes; On Mercury Medicines; and Treatise On Nervous Diseases.)

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transits which will yet take place in the present century (civil time at Paris):—

1341 8 May, 8 P.M. 1879 6 May, 7 P.M.
1348 2 Nov., 8 P.M. 1881 8 Nov., 1 A.M.
1361 12 Nov., 7 A.M. 1891 10 May, 3 A.M.
1368 5 Nov., 7 A.M. 1894 10 Nov., 6½ P.M.

Elements of the Orbit of Mercury.

Epoch, 1799, December 31, 12th mean astronomical time at Seelberg.

Semimajor 3970935, that of the earth being assumed as the unit.

Excentricity 2041704; its secular increase (or increase in 100 years) 0000039.

Inclination of the orbit to the ecliptic 7° 0′ 3″-9; its secular increase 16″-4.

Longitudes from the mean equinox of the epoch: (1.) of the ascending node, 45° 51′ 9″-0; its secular increase (combined with the precession), 4215′-1; (2.) of the perihelion, 74° 20′ 6″-0; its secular increase (combined with the precession), 5652″-9; (3.) of the planet (mean), 108° 4′ 45″-3.

Mean sidereal motion in one mean solar day, 4° 6′ 53″-588; in 362½ it is 53′ 42″ 47″-65 more than 4 complete revolutions; sidereal revolution, 87° 99256 mean solar days.

MERCURY, TRANSIT OF. [MERCURY; VENUS, TRANSIT OF.]

Merganser (Mergus, Bonap.), a subfamily of Anatidae, consisting of the genus Mergus, Linn., the Goosanders or Mergansers of the British. The Prince of Hesse makes it include two subgenera, Mergus (Smeeuw) and Merganzer, Leach (The Goosanders), and places the subfamily next to the Fuligulinae, and immediately preceding the Plectanidae. The Linnaean genus Mergus is placed between the last section (Cristatas) of the great genus Anas and the genus Alca in the Systema Naturae, and the position assigned to it by various authors will be found in the article Ducks. In the second volume of Mr. Swainson’s Classification of Birds, the subfamily is placed after the Fuligulinae, and immediately preceding the family Colymbidae.

The species are not numerous, and of these, Merganzer, Serratior, albellus, and acutillatus are found in Europe. We select M. Merganzer and M. albellus as examples.

Merganzer. (Leach.)

Example, Merganzer Castor (Mergus Merganzer and Castor of Linnaeus).

Description.-Very Old Male. Tufted head (the tuft large and thick), and part of the neck greenish black, the reflection varying in different lights; lower part of the neck, breast, belly, abdomen, covert of the wings and scapulars farthest from the body, tinged of a yellowish rose colour* (which soon fades in stuffed specimens to white) on the under parts; upper part of the back and scapulars nearest to the body deep black; quills blackish; great coverts bordered with black; rest of back and tail ash-coloured; beauty-spot on the wing white, without transverse bands; bill deep red, black above and on the terminal nail; iris reddish brown, sometimes red; feet vermilion red. Length 25 to 28 inches. (Temm.)

In this plumage the bird is the Mergus Merganzer of Linnaeus and others; Le Harle of Buffon and the French; the Goosander or Merganzer of Latham and Pennant; Gansenser-ťiger and Taucher-gans of Hoechstein and the Germans; Mergo, Ora marina a Mergo dominicano of the ‘Stor. regl. Uecl., and Dubblelle Zueghe of Sepp and the Netherlands.

Female.—Tuft long and loose; head and part of the neck reddish brown; throat pure white; lower part of the neck, breast, sides, and thighs whitish ash; all the upper parts deep ash; beauty-spot on the wing white, without any transverse bands; bill faded red; iris brown; feet yellowish ash, webs ash-y red. Length 24 or 25 inches.

Young Male of the Year: Similar to the females.

The Young. The plumage of the young is easily distinguished by blackish spots disposed on the white of the neck, the rusty colour of the neck is then terminated by a deeper colour; blackish plumes begin to show themselves on the top of the head, and white feathers appear on the coverts of the wings.

In this state the bird is the Mergus Castor of Linnaeus and others; Mergus rubicoptillus of Gmelin; the Harle femelle of Buffon; the Dun Diver or Sparring Poodle of Latham and others; and the Mergo ova of the ‘Stor. regl. Uecl.’

This species is the Sugherone of the Italians; the Meer-rack and See-Rack of the Germans; Wrachfogel, Kyrkjefogel, Arud, and Skruka of the ‘Fauna Sueciae;’ Salleslager of the Danes; Skor-and of the Icelanders; Prêch of the Greenlanders; Skok of the Cree Indians; Hunagakanahdog of the antient British; and Goosander and (provincial) Jack-saw of the modern British. It is supposed to be the Kátoros ὁρίς, of the Greeks, the fiber and Castor Ales of the Latins, and is the Bocre of the old French.

Food: Reproduction: Utility to Man.—The food of the Goosander consists of small fish, amphibious animals, small crustaceans and mollusks. Temminck says that its nest is placed among rolled pebbles on the banks of waters, in bushes or in hollow trees, and that it lays twelve or fourteen whitish eggs, which are nearly equally pointed at each end. The flesh is very rank and bad. Graves, who tasted one, pronounces it to have been offensive in the highest degree. The old French quatrain, in the Portraits des Oiseaux, gives the following description of its habits and of its quality as food:—

Le Biscue estai aux estangs et plonger
Pour le poisson, aquest est dommageable.
Mange envois fesoyer ne gloutem.
Puisidroit un Biscue avoit son manger.

Geographical Distribution.—Mr. Gould (Birds of Europe) states that "its native locality appears to be the northeastern regions of the continents of Europe and America, where, among large and uninfrequent lakes, it finds an asylum. From these, its summer haunts, it emigrates southwards on the approach of the severities of winter, seldom appearing in our latitudes unless the season indicates an exceedingly low temperature in the Arctic circle: at such times it frequents our shores, and unfrozen lakes, either in pairs or in small flocks of seven or eight; but the extensive inland waters of Holland and Germany appear to

* The under plumage of the specimen described by Dr. Richardson had the under plumage rich buff orange, which faded to white.
be its favourite resort.' This species was shot at Fulham in the severe winter of 1837. It appears in Dr. Richardson's list of birds, that they merely winter in Pennsylvania and migrate in summer to rear their young in the fur countries; the specimen described by him was killed on the Saskatchewan. It also occurs in Major Sabine's list of Greenland Birds. The Prince of Musignano notes it as rather rare in winter at Rome, and as not common, at the same season, in Philadelphia (Specchio Comparativo), and as occurring in Europe generally, and in America generally, in his Geographical and Comparative List of the Birds of Europe and North America. It was seen in Japan by Dr. Von Siebold and M. Bürger.

This species is the Kreutz-Ente of Frisch and the Germans; the Herid Side of the Danes; Sugherone ocehalarno of the Italians; Litorum son of the ancient Britons; Swew and (provincial) White Nuu, Vare Wilgen and Smece of the modern British.

Food; Reproduction; Utility to Man.—The food of the Snow consists of small crustaceans, water-insects, mollusks, little fish, and water-plants. The nest, according to M. Temminck, is placed on the borders of rivers and lakes, and the number of eggs amounts to twelve; they are whitish. The bird is in no request for the table.

Geographical Distribution.—The countries of the Arctic circle in both worlds; migratory in autumn, but especially in winter, in England, Holland, France, and as far as Italy; rather abundant in Holland on the lakes and marshes (Tenn.). It is seldom seen in Britain except in inclement winters. The species was not observed by Dr. Richardson, but it is noted by him in the tables compiled from the Specchio Comparativo as one of the birds that migrate northwards from or through Pennsylvania in spring, and may therefore be considered as returning to the fur countries to breed. The Prince of Musignano notices it as rather common in winter, particularly the young, near Rome, and as very rare and adventitious at Philadelphia (Specchio Comparativo). The same author, in his Geographical and Comparative List, notes it as occurring in Europe generally and on the northern and central coasts of America. Dr. Von Siebold and M. Bürger found it in Japan.

Example, Mergus albula. Description.—Old Male. A great spot of greenish black on each side of the bill, a similar coloured but longitudinal one on the occiput; the tufted crest, neck, scapulars, small coverts of the wings, and all the lower parts very pure white; upper part of the back, the two crests which are directed under the sides of the breast, and the edges of the scapulars, deep black; tail ash-coloured; sides and thighs varied with ash-coloured zig-zags; bill, legs (tarsi), and toes bluish ash; webs black; iris brown. Length 15 to 16 inches.

In this state the bird is Mergus albula of Linnaeus and others; Le petit Harle huppé or la Pieute de Buffon; the Winter Stürmer of Boehm and others; the Witte of Beek; the Ducker of Sepp; the Mergo Ocui minor of the 'Stor. degl. Uce.' and the Snow or White Nun of the English ornithologists.

Female.—Summit of the head, cheeks, and occiput red-brown; throat, upper part of the neck, belly, and abdomen white; lower part of the neck, breast, sides, and rump bright ash; upper parts and tail deep ash; wings variegated with white, ash, and black. Length 15 inches.

Young of the year, similar to the female.

Males at the Age of One Year.—These are distinguished by the small blackish feathers which form the great spot at the side of the bill; by some whitish and white feathers scattered on the head; by the upper part of the back, which is variegated with black and ash-coloured feathers; and by indications of the two black crescents on the side of the breast.

The young of both sexes have the great coverts of the wings terminated by a large white space, while the old ones have no white there except at the point.

M. Temminck remarks that the Harles, or birds of this subfamily, live upon the waters, where they swim, having generally the whole of the body submerged, and only the head out of the water. They dive easily and often, swim with extreme agility entre deur eau, and use their wings to assist them in this sort of natation. They remain long on wing, and fly very swiftly. Their walk is very vacillating and embarrassed, their legs or feet, as well as those of the sea-ducks, being more withdrawn within the abdomen than those of the ducks which have the posterior toe smooth. Their food consists principally of fish and amphibious animals, and of the first they make great destruction. In temperate climates they are only seen in winter; their habits are very much similar to those of the old country, for they are much wider than the different species of ducks, and have not been domesticated. They moult once a year; but the old males, like those of the ducks, moult in the spring, whilst the old females and the young moult in the autumn. The young males, before their first or second moult, hardly differ at all from the females.

MERGER. It is somewhat difficult to give an exact definition of this legal term. In order to form an accurate notion of what is meant by it, the notion of the legal term estate (Estates) is a necessary preliminary. The accession of one estate to another, or more accurately speaking, the circumstance that two estates immediately expectant on each other, meet or are united in the same person, is the cause of the merger.' (Frostton.) These words express in
general terms the conditions necessary in order that merger may follow as a consequence. This consequence, called merger, is that the preceding estate ceases to exist, and the estate in which this preceding estate is said to be merged continues to be exactly the same as it was before that union which was the cause of merger.

It is necessary to add to this general description of the cause of merger, that the estate which is prior in point of time is wholly engulfed by the latter estate which immediately follows: it may be either equal or less, but not greater. Also, the estates must both be vested estates, and both must be legal or both equitable estates.

Thus, if A is tenant for life, with reversion to B in fee, and A surrenders his estate to B, or B releases his estate to A, in either case the life-estate is merged, the consequence of which is that the estate in reversion immediately becomes a fee in possession. It seems that one term of years will merge in another, and a larger term in a less; at least this is the case when the second term is a term in reversion. Thus, if A is tenant for years, with reversion to B for years, and A surrenders or assigns his term to B, the term which belonged to A is merged. There is one exception to this rule: if the estate of A is derived from the estate of B as an underlease, the original term of B is not abridged by such merger. In fact, merger, in the proper sense of the term, can never apply to a surrender or assignment of an estate in fee subject to a term of years, as is the case of an underlease, or of a term estate, or of a year or less.

If a, who is seised in fee, leases first to B for five hundred years, and then to C for ten years, by way of immediate reversion, and C assigns his term to B, the estate of B is merged in the estate of C, which becomes an estate in possession, and can have no longer duration than ten years. Opinions vary as to the question whether a term can merge in a term in remainder. Estates tail are not subject to merger; an exception which is a necessary consequence of the form of the gift: to the heirs in tail, so long as there are any. Formerly, if an estate tail had become a base fee by the tenant in tail levying a fine, such base fee would merge by union with the immediate reversion in fee. But by a recent statute (3 and 4 W. 4 & 5, c. 5), estates tail are not merged by union with the immediate reversion in fee, but shall be 'enlarged into as large an estate in fee tail, with the consent of the protector, if any, might have created by any disposition under this act, if such remainder or reversion had vested in any other person.

If the two estates, the union of which in one person might otherwise cause merger, do not unite in him in the same right, there is no merger.

The various exceptions to the general principles of merger are numerous enough to form the subject of an entire treatise. The whole subject is discussed at great length in the third volume of Mr. Preston's Treatise on Conveyancing. The origin of the doctrine of merger is uncertain, and no hypothesis seems fully to explain all the cases of merger as now settled. In the case put by Bracton (fol. 12), the termor for years who had become the seefol of the land, is considered as having, by the acceptance of the freehold, renounced the term (ex quo idem se tenetur ad foedus amentum, tacite termino renuntiavit). The origin of merger is discussed in Preston's third volume, chap. iii., &c.

MERGUI. [Tenasserim.]

MERGULUS. [Aux, vol. iii., p. 100.] The Prince of Mergulus, or Mergul, in the Bay of Biscay among the islands of the group called the Canaries, in the northern and central parts of Europe, and on the northern shores of America. (Geographical and Comparative List.)

MERIAN, MARIA SYBILLA, the daughter of Matthew Merian, an eminent Dutch engraver, was born at Frankfort-on-the-Main, April 12, 1647. Her instructor in drawing was Abraham Mignon. In 1665 she married John Andres Graf, a painter of Nurnberg, but the celebrity which attached to her own name as an artist prevented that of her husband from being adopted. They had two children, both daughters, who were also skilled in drawing. In consequence of liberal offers Madame Merian and her husband settled in Holland, but Maria Sybilla, whose great object was the study of nature, travelled for the sake of delineating insects, flowers, and other natural objects. In 1699 she went to Surinam, for the express purpose of making the drawings which have since added so considerably to her fame. In 1701 she married the Arminian of that name, and two of her children, namely: 1. The Origin of Caterpillars, their Nourishment and Changes,' in Dutch, 2 vols. 4to., the first published at Nurnberg in 1679, the second in 1683, published in Amsterdam in Latin, 4to., 1717. This work, much enriched by her daughter, was published in French by John Marret, fol., Amst., 1750, under the title of 'Histoire Generale des Insectes de l'Europe,' 2. 'Disertatio de Generazione et Metamorphosis Insectorum Surinamensium,' fol., Amst., 1675, separately in Dutch and in Latin. These plates, when engraved, were composed of the latter ones twelve plates were annexed by her daughters Jane Helen and Dorothea Maria Henrietta. There is an edition of this work in folio, French and Dutch, printed at Amsterdam in 1719; another in French and Latin, Hare, 1726; and another in 1730. There have also been editions of the two works united, under the title of 'Histoire des Insectes de l'Europe et de l'Amerique,' fol., Par., 1768 and 1771.

Madame Merian died at Amsterdam, January 1, 1717. Many of the original drawings of this artist are preserved in the department of drawings and prints in the British Museum, in two volumes, purchased by Sir Hans Sloane at a large price. One contains the insects of Surinam, the other of the insects of Europe. They are though elegantly finished, appear, upon examination, not to be brittle drawings, but to have been coloured upon outline proofs of the engravings. Those of Europe are entirely original delineations. All are upon vellum. Other drawings are preserved at the British Museum, and in the collections in Holland, and at Frankfort. A portrait of Madame Merian, formerly Sir Hans Sloane's, is still preserved in the British Museum. An engraved portrait of her, by Houbraken, is prefixed to the Latin edition of the 'Origin of Caterpillars,' 1717.


MERIDA, one of the cities of Extremadura in Spain, in 38° 48' N. lat., and 6° 15' W. long. It was founded by Publius Carisius, a Roman general under the emperor Augustus, from whom it was named Emerita Augusta. It was subsequently made the capital of the province of Lusitania (which included nearly the whole of Portugal, with part of Leon, Extremadura, and Old Castle), and was the largest and most magnificent city in Roman Spain. From the hands of the Romans it passed into those of the Goths, who made it an archiepiscopal see. In the year 857 it was the focus of a plot formed by the king, and extinguished by a long war, and expatriate the Catholic religion from the land. It was also the seat of several provincial councils, of which that of A.D. 666 is the most known. On the invasion of the Arabs in 711 it offered a stout resistance, but was eventually obliged to capitulate to the Moors, who, on entering the city, were amazed at its vast size and the grandeur of its buildings. According to a Moslem chronicler it was then eight miles in circumference, and was garrisoned by 90,000 men. By the Arabs its original name was converted into  Mirida. In 1220 it opened its gates to the Christian king Alfonso XI. of Castille and Leon, after a great battle, in which, aided by the apostle James and other saints in white robes (as tradition has it), he routed a greatly superior force of Moors, headed by their king Ibn Hul. Alonso, to testify his gratitude, ordered the city to be razed to the ground, but St. James, in whose hands it has till recently remained.

Modern Merida is one of the most decayed and poverty-stricken towns in the Peninsula. In extent it has shrunk to a very small couple, and its population has dwindled to less than 3000; and the trade in merino wool, of which it has long been the depot, is rapidly declining. It is situated on the right bank of the Guadiana, on a rising ground, in the midst of an open and gently undulating country, that is very fertile, but almost uncultivated, and in summer rendered very unhealthy by malaria. The sole interest of modern Merida lies in its numerous remains of Roman magnificence. The houses, churches, walls, and pavements, abound in Roman remains, especially the columns, altars, vases, statues, and bas-reliefs. In the fields, gardens,
and roads without the town, similar remains are found. But the principal ruins are an amphitheatre almost entire, which by letting in the waters of the Guadiana could at pleasure be turned into a naumachia; a circus, said to equal in size the Circus Maximus at Rome, a theatre, where in modern times bull-fights have been held; the shell of a lofty tri- umphal arch, now stripped of its ornaments; some baths in excellent preservation, and a gateway defaced by Arabic inscriptions. Enclosed in a private house is a small peripheral tenth century church, which the walls of the column of the columns are of granite. There are also two Roman bridges; one of enormous length and curious construction, with a fortress at one end. Near the town are the ruins of two grand aqueducts built of brick and granite mixed. Of the latter materials are all the antiquated edifices of Mérida, with very trifling exceptions.

At the distance from Mérida of one and two leagues respectively are two remarkable reservoirs, by some considered of Roman, by others of Moorish architecture. The first, called A.I. [Susa.]... 60 feet in depth, enclosed by thick walls, with two fine towers. The other, called Albuera, is smaller, but its walls and the single tower which surmounts them are much finer.

[Mariana, Historia General de España; Condé, Historia de los Arabes; Pons, Viaje de España; Laborde, Itinéraire Description de l'Espagne; Semple's Journey through Spain and Italy; Captain Cook's Sketches in Spain.]

MERIDIAN (meridies, mid-day). In the heavens the meridian is the great circle which passes through the pole and the zenith of the spectator; on the earth it is the circle which passes through the pole and the spectator's position; consequently the terrestrial meridian is the section of the earth made by the plane of the celestial meridian.

The circle derives its name from being that on which the centre of the sun is found at mid-day, or real noon. In the case of a fixed star, the time at which its altitude is greatest is the moment of its coming on the meridian; but in that of the sun, the orbit of the earth, in preventing the moment of its culmination (or coming on the meridian) from being exactly that of its attaining its highest point; though the difference is not worth noting for ordinary purposes. [Siner, Doctrine of the Earth; Tyndale, Celestial Navigation.]

MERIONES. [Merino.]

MERIONETHSHIRE, a county of North Wales, bounded on the north by Caernarvonshire and Denbighshire, on the east by Denbighshire, on the east and south-east by Flintshire, on the south by Cardiganshire and on the south-west and west by Cardigan Bay, an inlet of the Irish Sea. Its form approximates to that of a right angled triangle, having two sides facing the north and west respectively, and the hypotenuse facing the south-east.

The area of the county is estimated at 666 square miles; it is the sixth of the Welsh counties in respect of size, being a little smaller than Cardiganshire, but larger than Denbighshire. The population in 1821 was 34,582; in 1831 it was 35,203, showing an increase of 118 persons only, and giving 53 inhabitants to a square mile. In absolute population it is inferior to all the Welsh counties except Radnorshire; and in density of population is inferior even to that of Bala and Dolgelly... The county election for members of parliament takes place at Harlech. Bala, the nearest of these places to London, is in 52° 55' N. lat. and 3° 34' W. long., about 180 miles in a direct line north-west of London, or 194 miles by the Holyhead parliamentary road to Holyhead, and thence through the

Coast Line.—The northern part of the coast is formed by the estuary of which the Tract Bach and the Tract Bach are portions. The Tract Bach (of which a considerable part has been recovered from the sea by an embankment) runs along the coast, having its branches (the estuary from side to side) forms the boundary between Caernarvonshire and Merionethshire. The Tracht Bach or Bychan belongs entirely to the latter: it comprehends many thousand acres, and receives the rivers Folyntwy, or Bychan, and Dwyrydd. This arm of the estuary penetrates several miles inland, becoming narrow as it proceeds. It is dry at low water, except a narrow channel in the centre, through which the united streams find their way into the sea, and is crossed by a ferry.

From the Tract Bach the coast runs south about six miles past Harlech to the little headland on which stands the village of Mochnaes or Mochras. From the Tract Bach to the town of Harlech the immediate neighbourhood of the sea is low and marshy. Between Harlech and Mochnae the coast rises into cliffs. It is skirted by sands dry at low water, and at some distance out to sea are three sand-banks, the 'Dutch Bank,' the 'Pontigal Bank,' and the 'Sarn Badrig' (St. Patrick's Causeway) or 'Sarn Badrigwy' (Shipbreaking Causeway). This remarkable sand runs in the immediate neighbourhood of the coast 22 miles out to sea in a south-west direction; it is composed of sand and gravel. It is dry at the ebb in spring tides, and in storms is marked by fearful breakers. Tradition says that this sand has prevented all but one inhabitant of the country about the Gwaedol, or the Lowland hundred, and that it was overwhelmed by the sea about the close of the fifth century. (Pennant.) The name, St. Patrick's Causeway, is said to have originated from a monkish legend that it was formed by Cader Berwyn or Berwyn in order that he might pass from Ireland to Britain.

From Mochnæs the coast runs south-east eight miles to the river Maw, at the mouth of which stands the town of Aber-Maw, contracted into Bar-Maw or Barmouth. This town is situated on Montgomeryshire, now only skirted by sands of greater breadth. From the Maw the coast runs southward 14 miles to the wide estuary of the Dovey, taking a circuit convex to the sea, and rising into cliffs midway between the rivers. At the southern extremity of this estuary is the river Twech, which issues into the sea. Between the Twech and the Dovey the coast is again skirted by sands. The whole extent of the Merionethshire coast is about 38 miles, following its principal bends.

Surface and Geological Character.—Merionethshire is the most mountainous of all the Welsh counties, and contains some of the loftiest peaks in North Wales; there are however no peaks so high nor precipices so abrupt as those of Montgomeryshire. The mountains are divided into three ranges, of which the one at Harlech, the mountains of Berwyn, and which traverses the county from north-east to south-west, skirting the valleys of the Dee, the Wnion, and the Maw. The principal summits of this chain are, Cader Berwyn or Berwen, on the border of this county and Montgomeryshire, seven miles south of Corwen, 2563 feet above the level of the sea; Arran Footway, near the Wnion, above Dolgelly, 2553 feet; Pen-y-Gadair (summit of Cader Idris), three miles south-west of Dolgelly, 2914 feet; and Pensarn, on the extreme east of the county, near the town of Bala, and near the centre of the county, is a group of mountains, of which Arring Mawr is the highest point, 2809 feet above the level of the sea. From this central group branches run westward to the sea in the neighbourhood of Barmouth and north-westward to join the group of Snowdon. There are no plains.

The county is almost entirely occupied with the slate rocks which predominate in North Wales. Along the valley of the Dee, as far up as Bala and the valley of the Alwen, a bluish grey limestone is found, which is quarried for lime, the principal manure employed in the county. Great quantities of white limestone are quarried and burnt for lime near Corwen. This limestone is surrounded on every side by primeval lacustrine conglomerates which occur on the eastern side of the county, as far as a line drawn from Bala, north-west along the vale of the Treweryn, and southward along the Twrch and the Dovey to Dinas-y-Mosdy. The slates of this formation are quarried in the neighbourhood of the town of Bar-maw.

Westward of the line described the rocks are chiefly slate, forming abrupt and rugged mountains of desolate appearance. Lead and copper mines are worked near Towyn at the mouth of the Dyswy, and copper-mines in the neighbourhood of Hay-on-Wye. On the north-east of the county, near the head of the estuary of the Trych Bychan, near the place where they are raised.

It was the opinion of some former observers that Cader Idris and some other mountains presented traces of volcanism. 'The steeper part of this mountain, says Mr. Pen-
nient, 'to the highest peak, or Pen-y-Gadair, grows more and more rocky; the approach to the summit extremely so, and covered with huge fragments of discoloured rocks, very rugged, and cumbered by a heavy-wooded matter, which gives them a very volcanic look, added to their disjoined adventitious appearance. I met with, on my ascent, quantities of pumice of the same cellular kind with the toadstone of Denbighshire, but of a green colour. The day proved so wet and misty, that I left the valley of the Alwen between two summits. I could only see that the spot I was on was a rude aggregate of strangely disordered masses. I could at intervals perceive a stupendous precipice on one side where the hill recedes inward, forming a sort of theatre, with a lake at the bottom, and three peaks with a 'head-topped' ridge that forms the summit. On the other side, at a nearer distance, I saw Craig Cay, a great rock, with a lake beneath, lodged in a deep hollow, possibly the crater of an ancient volcano.'

Hydrographically, the principal valleys belonging to the county are the Dee, the Alwen, and the Dywry. The Dee rises in the valley skirted by the Berwyn mountains, very near the road leading from Bala to Dolgellau; from its source it flows the course which is about 8 miles by way the Lwy and the Trecw, each considerably longer than itself into the lake of Bala, called Llyn Tegid, i.e. 'the fair lake,' by the Welsh, but by the English, Pimble Meere. [Bala.] From the lower end of the lake the Dee flows 12 miles in a wide course, by which follows the course of the river of mountain streams: from Corwen it flows five miles east to the border of the county, which it divides from Denbighshire for two or three miles farther, before finally quitting it. The Treweryn or Glettwr, a feeder of the Dee, rises in the county, and the Tafanol, an east course of about fourteen miles into the Dee, which it joins just below the lake of Bala. Just above Corwen the Dee receives the Alwen, one of its tributaries, which though belonging chiefly to Denbighshire, has five miles of its course upon the county, and forms a beautiful fall. The Maw, otherwise called Mawddach, rises near the centre of the county, and has a southern course of eight miles to its junction with the Lynamduon, which lies more to the westward, and is of about equal length. From the junction of the Lynamduon the Mawddach flows south-west, four miles to the junction of the Wnion (twelve miles long), which rises close to the source of the Dee, and flows along the same valley, but in an opposite direction. For the remainder of its course the Maw is a tide river. In this part of its course it expands into an estuary in some places a mile wide, and in great part dry at low water.

The Dywry, or Dyff, rises just within the border of the county, in the mount Arran. Fowda and Bearnchain. From its source it flows south-west nearly thirty miles through a winding vale into the bay of Cardigan. It receives a number of small mountain streams, of which the Tafafog, the Afn, the Dulas, and the Cwmceilli are the principal. A part of the course of the Dywry itself and of the Tafafog, and the whole course of the Afn and the Dulas, belong to Montgomeryshire. The lower part of the course of the Dywry is on the border of Merionethshire, which it separates first from Montgomeryshire, and then from Cardiganshire. Near the mouth it expands into a wide estuary, the greater part of which is dry at low water. The Dywry is not mentioned in Priestley's 'History of Navigable Rivers' as navigable, but is marked in the map which accompanies that work as navigable. The direction of the Cwmcelli and the Dulas, twelve or thirteen miles from the mouth of the river.

The Dywry rises in the Berwyn mountains, a little to the north-west of Cader Idris, and eight miles south by west into the sea by the Maw and the Dywry. About three miles from its source it expands into a small lake, called Llyn-y-Mygil, which in width nearly fills the valley of Tal-y-Llyn, leaving only a narrow road on one side, and extends in length about three miles. The Dywry above its mouth expands into an estuary of about a mile wide, but just at the mouth is contracted into a very narrow channel. None of these streams, except the Dywry, are navigable: the estuary at the mouth of the Mawddly forms the harbour of Barmouth.

There are many lakes, most of them small. The largest are Llyn-Tegid, or Bala Lake, and Llyn-y-Mygil, already noticed.

The principal roads are those from London by Shrewsbury to Corwen and Bangor, to Bala and Caernarvon, and to Dolgelley, or Dolgelieu, and Barmouth, with branches to Towy. The first of these enters the county on the east from Denbighshire, a little beyond Llangollen, and runs along the valley of the Dee to Corwen, from which place it follows the valley of the Alwen into Denbighshire. There are two Bala roads, both branching off from the left, one at Corwen, which follows the right bank of the Dee up the valley to Bala, the other a little beyond Corwen, which follows a valley parallel to that of the Dee, from which it is separated by its branches, and then runs up the valley of the Treweryn to Festiniog and Tan-y-Bwlch to Beddgelert, with a branch from Tan-y-Bwlch to the coast to Harlech and Barmouth. Another road from Bala follows the valley of the Dee and the river to Dolgelley and Barmouth. There is a nearer road from London to Bala by Shrewsbury and Llangynog.

The Dolgelley and Barmouth road runs from Shrewsbury, through Welshpool and Llanfair (Montgomeryshire), to Montgomeryshire, and the county of the Tafafog and follows that valley and the vale of the Dee to Dinasy-Mowddwy, or Mowddwy, from which place it runs west to Dolgelley and Barmouth. Two branches from this road run to Towy; one a little before reaching Dinasy-Mowddwy, which runs along the vale of the Dee and the river, and the other a little before reaching Dolgelley, which follows the vale of the Dysnwai. This first branch to Towy is partly in Montgomery and Cardigan shires, and communicates with Machynlleth and Aberystwyth.

The county is largely watered by the Welsh Merionydd, or Merionydd, is the only one in Wales that, with the addition merely of the word 'shire,' retains its ancient designation. This name is supposed to be derived from Merion, grandson of a chiefman to whom a large territory in this part of Wales was assigned in the fifth century. If however the district was known to the Romans, as some think, by the name Mervinia, which evidently contains the same root (Merion, or Merion) as Mor-y-Meirion-yd, the name may be of earlier origin.

Writers are not agreed as to the antient division of the county; but its limits appear to have undergone considerable change. One cantref, that of Arudty or Arwysil, south of the river Dyve or Dyff, was by Henry VIII. added to the county of Montgomery.

The present divisions, with their relative position and their population in 1831, are as follows—

<table>
<thead>
<tr>
<th>County</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arwedwy, or Arudwy</td>
<td>N.W. 10,499</td>
</tr>
<tr>
<td>Edeeron, or Edeyrnon</td>
<td>N.E. 9,005</td>
</tr>
<tr>
<td>Estimanner, or Estianner</td>
<td>S. 8,248</td>
</tr>
<tr>
<td>Penlyn</td>
<td>N. &amp; N.E. 6,654</td>
</tr>
<tr>
<td>Talbybont, or Tal-y-bont, and Mowddwy</td>
<td>S. &amp; E.B. 8,347</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>County</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Militia</td>
<td>35,236</td>
</tr>
<tr>
<td>...</td>
<td>... 79</td>
</tr>
<tr>
<td>...</td>
<td>35,315</td>
</tr>
</tbody>
</table>

There are five ancient market-towns, namely: Bala and Dolgelley, the assize-town; Harlech, the place of county divisions; Corwen and Dinasy-Mowddwy; and two, where markets have been established of late years, viz. Towy and Barmouth. [BARMOUTH.]

Bala is in the parish of Llanfylli or Llanfylli, in the hundred of Penllyn, near the outlet by which the Dee issues from the lake of Bala; 194 miles from London by Shrewsbury and Llangynog, or 207 miles by Shrewsbury and Corwen. [Bala.]

The population of Llanfylli parish was, in 1831, 2359: there was no return of the population of the town, but in 1821 it contained 1163 inhabitants out of 2467, the whole population of the parish at that time.

The living of Llanfylli is a rectory, in the archdeaconry and diocese of St. Asaph; of the clear annual value of £367, with a glebe-house and 130 acres of the bishop of the St. Asaph.

There were in the whole parish, in 1833, two day-schools with 139 children; one of these, a grammar-school, with
75 boys, was partly supported by an endowment. There were seven Sunday-schools, with 1088 scholars.

Dolgelley, Dolgelleu, Dolgelou, or Dolgellen (from dol, dalle, and gellen, or celii, a groove of hazels), is in the hundred of Talbont and the Merioneth, and in the south bank of the Wern, a river two above its junction with the Maw, 208 miles from London by Shrewsbury, Welshpool, Llanfair, and Dinas-y-Mwoddy. This town came into possession of Owain Glyndwr during his rebellion, and from here (a.p. 1400) he delivered ambiscopal and other diocesan service; it was the scene of a smart skirmish during the civil wars of Charles I., in which the parliamentarians were victorious. The town is in a delightful valley; the streets are narrow and irregularly laid out; and the houses are for the most part of limestones and lime-mortar. Within the last few years however some handsome dwellings have been erected, and the general appearance of the town materially improved. The church is a neat structure, capable of accommodating a thousand persons, but destitute of any architectural pretensions. The county hall and county gaol were both erected in the present century; the former is a neat stone building, near the river Wnion. The townhall is scarcely distinguishable from the ordinary houses, and the market-house is a low square edifice. There is a neat small river arch, and a bridge over the river Wnion.

The population of the parish (which is very extensive) was, in 1831, 4087; less than a fourth of which was agricultural. Dolgelley is the most populous and most commercial town in the county. The leases of the farm are for 72 years above twenty years of age as employed in the manufacture of "webs," or coarse woolen cloths and flannels. They are made in the houses and cottages of the weavers. Fulling-mills and bleaching-grounds have been established in the town, and the manufacture of the coarsest cloths, when finished, are bought up by agents, and sent to Liverpool for exportation to America, or to Shrewsbury, from whence they are sent to different parts of England. There is a good deal of business done in tanning and dressing lambkins, and flannels, which are sent to Chester and other places. The markets are on Tuesday and Saturday, and there are several yearly fairs. The summer assizes and the Easter and Michaelmas quarter-sessions are held at Dolgelley; also the petty-sessions for the division, and, probably, the quarter-sessions for the recovery of small debts.

The living is a rectory, in the archdeaconry of Merioneth and diocese of Bangor, of the clear yearly value of £40l. There are several dissenting places of worship in the town or parish, chiefly belonging to the Independents or the Calvinistic Methodists. There were, in 1833, five day-schools with 155 children: of these schools, one with 33 children was partly supported by an endowment; one day and Sunday national-school, with about 100 children, and seven Sunday-schools; and fourteen Sunday-schools, with nearly 1400 scholars.

Harlech is in the parish of Llandanwg, in the hundred of Arddwy, near the shore of Cardigan bay, 2394 miles from London by Dolgelley and Barmouth. It has been supposed that Harlech was a Roman post, but for this opinion there is no just ground. An ancient British fortress, called originally Twr Bronwen, and, at an after-period, Caer Collwn, occupied the site of the present castle erected by Edward I. This strong fortress was held in the civil war of the Roses by Dafydd ap Tewdwr, a stout partizan of the house of Lancaster. Dafydd, after a valiant defence, was obliged to surrender to Sir Richard Herbert, on an engagement that his life should be spared. Edward IV. was then in being, and, in consideration of the engagement, had not Sir Richard declared that if the king persisted in his purpose, he would replace Dafydd in the castle, and the king might send whom he would to take him out. In the civil war of Charles I., the castle changed masters; once again it fell into the hands of the English, but was afterwards taken under General Mytton, March 1647. The town of Harlech is little more than a village of small size and insignificant appearance, situated between a wild and desolate mountain country and the sea. The most striking object in the castle, the ruins of which are situated on a rocky rock, facing the bay, and rising above an extensive marsh once occupied by the sea. Its walls are tolerably perfect; they form a square of about seventy yards each way, with a round tower at each corner. From these corner towers formerly rose elegant turrets, but these are in great part destroyed. There are round towers on each side of the entrance. The apartments, now open to the sky, are of large dimensions. There are traces of the antient British fortress in the foundations of the present structure. Toward the sea is in prospect the beach supplied on which it stood; on the land side it was strengthened by a deep ditch cut with enormous labour in the solid rock. The assizes and county court, once held at Harlech, have been long removed; the market, held on Saturday, has fallen to the market gardens near the sea-side. There are the only public business transacted here. There are several fairs, chiefly for live stock. The population of the parish, in 1831, was 658, about one-third agricultural.

The parish of Llandanwg is a rectory, united with the chapelry of Llanbed, in the archdeaconry of Merioneth and diocese of Bangor, of the clear yearly value of 19l. There were, in 1833, one boarding-school, with six scholars; one day-school, partly supported by an endowment, with 36 scholars; and two Sunday-schools, with 153 scholars.

Corwen is in the hundred of Edernon, on the south bank of the Dee, just below the junction of the Afon, 194 miles from London on the Holyhead parliamentary road. There was formerly a British or Welsh post near this town, named the Antient Corwen, but no remains of it now exist; it was on a broad hill, and a half round, still remaining, on the summit of a steep hill, and of a circular habituation, now in ruins, within this enclosure. In the invasion of Wales by Henry II., a.p. 1170, the prince assembled the Welsh forces at Corwen under Owain Gwynned. There are said to be some traces of the Welsh encampment near the town. Corwen is a small place, but neat; it stands on a rising ground just above the river. The church is a neat structure, accommodating about seven hundred persons, in a romantic situation, immediately at the foot of a rocky precipice belonging to the Berwyn mountains. On the south side of the church is a stone stair or cross, called by the common people the "Stone Stair of Ter" and "Cross of Ten," and probably the churchyard is a neat almshouse for six widows of clerks.

There is another almshouse for eight poor women. One of the county bridewells is at Corwen. "It is a small house, inhabited by the keeper (who is a shoemaker), his family and the very few prisoners who are usually to be found here."

The population of the parish, which is extensive, was, in 1831, 1956, about half agricultural. There are no manufactories. The markets are on Tuesday and Friday, the former for corn; and there are several yearly fairs.

The living is a vicarage, in the archdeaconry and diocese of St. Asaph, of the clear yearly value of 390l. There is also a sinecure rectory, of the clear yearly value of 576l. There were, in 1833, one day and Sunday national-school, with 69 children; one day and boarding-school, with 26 children; and twelve Sunday-schools, with 748 scholars. There are several dissenting congregations in the parish, chiefly Calvinistic Methodists. Dinas-y-Mwoddy, or Dinamouthy, is in the parish of Mallwyd, and in the hundred of Talbont and Mowddu, 203 miles from London through Ludlow, Montgomery, Welshpool, and Llanfair. It has been thought by some to have been formerly a place of greater importance, but no marks of former greatness are trace of; it was perhaps the residence of some small chieflain. The town is situated on a shelf of rock at the junction of the Cerri, a small stream, with the Dovey: it consists of a few mean cottages. There are one church, a very high and old and dilapidated; and six other places. The population of the parish of Mallwyd in 1831 was 1187; but the part which is in the county of Merioneth, in which the town stands, was 998: the town itself perhaps contains 300 inhabitants. A good deal of flannel is made in the town, and it is supposed that the woollen trade is carried on by several of the people. There is a corporation at Dinamouthy: the mayor exercises a conjoint jurisdiction with the county magistrates in the lordship or borough, which comprehends the parish of Mallwyd and the greater part of that of Llandanwg. There are stocks, and a rope-pulpit, over the prison which are scarcely used; and the municipal institutions altogether are characterised as "trifling and harmless." (Mun. Comms. Report.)

The living of Mallwyd is a rectory, of the clear yearly value of 252l., with a glebe-house, in the archdeaconry and
diocese of St. Asaph. The church is a large building, capable of accommodating a thousand people, but very thinly attended, most of the parishioners being dissenters. There were three in the parish in 1841, one day-school, and 35 children, and nine Sunday-schools, with 339 scholars.

Town, or Tywyn, is in the hundred of Estimane, near the coast, between the estuaries of the Dysnwyn and Dovey, but much nearer to the former, 227 miles from London by the Dysnwyn. The churchyard contains a number of good-looking houses, built chiefly of a coarse grey stone quarried in the neighbourhood. It is frequented in the bathing season by visitors attracted by the pleasantness of the situation in a quiet vale commanding a view of the sea. The artificial monument is a spacious building of considerable antiquity: it contains some venerable monuments; and in the churchyard are two rude pillars, one of them seven feet high, adorned with a cross, and bearing an inscription in ancient but illegible characters. In a field near the church is a spring, called St. Cadwgan's Well, the waters of which are considered beneficial in scrofulous, rheumatic, and cutaneous disorders. The spring is now enclosed, and two baths have been formed, with dressings and ladders.

The population of the parish in 1831 was 2694, about half agricultural. Some webs and flannels are manufactured. Races are held near the town, and are well attended. A custom called Gospel is held on Friday, and there is a market on Saturday. The churchyard is from the parish: it is frequented as a bathing-place, having the recommendation of a firm hard sand: it is on the estuary of the Dovey. There are dissenting chapels here. Slate-quarries are worked near Aberdovey, and a considerable stream of slate is carried on the port, which is a member of Aberystwyth.

The living of Town is a vicarage, in the archdeaconry of Merioneth and the diocese of Bangor, of the clear yearly value of 248l. 1s. 0d. per annum. There were, in 1833, four day-schools (one of them partly supported by endowment), each with about 50 scholars; two boarding-schools, each with about 10 scholars; and eleven Sunday-schools, with 50 to 80 scholars each, chiefly supported small diocesan and diocesan grants. There is one of the parish, called Goodger, which has the same name with the hundreds, and are nearly or quite conterminous with them. The deaneries of Abersoch, Estimane, and Tal-y-bont are in the archdeaconry of Merioneth and the diocese of Bangor; the deaneries of Mouthwy or Mowidy, Pontyll, Penlllyn, and Dyserth, are in the archdeaconry and diocese of St. Asaph. The map subjoined to the Third Report of the Church Commissioners represents all that part of the county which is in the diocese of Bangor as forming the single diocese of Harlech; and the map of the town and parishes wholly or chiefly in this county, besides a portion of one parish (Beddgelert), which is chiefly in Caernarvonshire. Four of these parishes are for ecclesiastical purposes, united with others; but there are three mere rectories, so that the number of benefices is thirty-three. Seventeen of these are in the diocese of Bangor, nine of them in the patronage of the diocese, and sixteen in that of St. Asaph, of which fourteen are in the bishop's own gift. The benefices are, some of them, tolerably rich; the wealthiest is at Tal-y-bont, in the parish of Beddgelert, and the most of them are under 200l. a year, and eight under 100l. a year.

The county is in the North Wales circuit: the Lent assizes and the Eynhallow and Midsummer quarter sessions are held. The Midsummer sessions are at Dolgellau, the Easter and Michaelmas quarter sessions, at Dolgelley. The county gaol is at Dolgelley; it is well situated, but badly arranged and deficient in many requisites. The number of prisoners is near 100. From this we conclude the severe condition of the people, for the average of the years 1829 to 1835, were only about 28 annually. There are bridewells or houses of correction at Corwen, described above, and at Bala. The latter is a small building, part of which is a guildhall, insecure, out of repair, and unfit for the use of the inspectors of prisons (in 1836) there were no prisoners.

The court of election for the county, which returns one member to parliament, is held at Harlech: the polling stations are Harlech, Bala, Dolgelley, Corwen, and Towy. There are no parliamentary boroughs in the county. History, Antiquities, &c.—In the earliest period of the authentic history of the island, Merioneth was included in the district of the Ordovices, who occupied nearly the whole of North Wales, a considerable part of Shropshire, and a part of Cheshire. In the Roman division of the island, it was included in the province of Britannia Superior. It is said to have been called Mervinia by the Romans. There are several traces of Roman works in this county. There are remains of camps near Bala [Balæ]; and in the immediate neighbourhood of that town is Tomen-y-mur, a circular bank near Betws-y-Coed, which is supposed to be a Roman fort, and to have had a small fort on its summit.

Tomen-y-Mur, 'the mount within the wall,' a station, of which the ditch and bank, with vestiges of a wall, remain, near Ffestiniog, near to the river, is to be identified with the place described by Sir Henry Moss of Richard of Cirencester, though Stukeley places it near Bala. Castell Prycor, a hilly fort about three miles east of Trawsfynydd, is considered by Pennant to have been originally Roman. The Dovey river is considered to be the Stucia (Secwia) of Ptolemy. A Roman road appears to extend north, then west, and then south, of the road to the legion. It is marked on the map of the county, and is traced in the neighbourhood of Trawsfynydd. This road is called Sarh-Selenn, a name which is interpreted by some as "the road of Sarh," a name of Mystes, the Roman name of the king of the tribe of the Maximus, who assumed the name of Maximus (a.d. 381) in the time of the emperors Gratian and Theodosius; and by others, 'the road of the legion.' From this road south, and near Tomen-y-Mur, roads are supposed to have led in one direction to Tomen-y-Mur, and in another direction to Bala. The Sarn-Helen is now entirely covered with turf, and is to be distinguished only by its elevation above the rest of the surface; but on digging, the layers of stone of which it was made are discoverable throughout the whole of its visible course: the aggregate breadth of these layers is about twenty-four feet. There are several tumuli or barrows near the road. There is a group of other monuments, probably sepulchral, near Rhudd-helen, a quarter of a mile south of the road from the Sarn-Helen, of considerable but undetermined antiquity. In the neighbourhood of Rhiw Goch, not far from Trawsfynydd, is a grave, called the grave of Porus, covered with an inscribed stone, evidently Roman; and near it is a great upright monolithic stone, of a kind frequent in Wales and in northern Europe. Roman coins, sepulchral urns, and other antiquities have been dug up in various places, particularly near Castell Prycor and Tomen-y-Mur; and at Caer Gai, near the archdeaconry, were discovered a lake (perhaps the site of a Roman fort); and at Clyfn Caer, near Penall, where was the site of another Roman fort.

There are a stone enclosure and fort and several other British antiquities near Llanddewi, between Barmouth and the English border, and near Ceredigion, and near Aberchale, and other Druidical remains. Other Druidical remains are found near Rhyd-ar-helen, not far from Ffestiniog. They are called Beddau Gwyr Arudwy, 'the graves of the men of Arudwy.'

During the Saxon period and the reigns of the earlier English kings of the Norman dynasty, Merionethshire does not appear to have been the scene of events of historical interest. One battle took place between the Saxons and the Britons in the neighbourhood of Harlech and Bala. The Briton lost the last of his sons in this battle, a bereavement which he has commemorated by one of his elegies. Merionethshire was afterwards the scene probably of many of those bloody feuds which disgraced the annals of Wales; but the singular seclusion of the situation of the county secured it from any serious foreign invasion. In proportion however as the consolidation of the Anglo-Norman power enabled the English to press the Welsh more closely, these previously unseen national antiques became more and more distinguishable. The invasion of the Scots by Henry II., his advance to Corwen, and the stop put to his progress there by the Welsh under Owain Gwynedd (a.d. 1163), have been noticed. Henry retreated into England after sustaining a great defeat in men and substance. This county was probably conquered by Edward I., a little before the final conquest of Wales; as Harlech Castle was completed before 1283, in which year Hugh de Wincle was constable of it, Merionethshire was the scene of the
rebellion of Owain Glyndŵr. [Glyndoir, Owen.] Harlech Castle was one of his conquests.

In the war of the Roses, Harlech was held for the Lancasterians, but taken, as mentioned above, by Sir Richard Herbert. After the war was concluded, the county became and long continued to be the scene of great confusion. A multitude of outlaws and felons established themselves in the neighbourhood of Dinas-y-Meody, and perpetrated a variety of crimes, burning, robbing, and murdering in large bands, and driving cattle in open day with the greatest impunity. To quell these outrages, a commission was granted by Queen Mary to two gentlemen of the county; one of them Lewis Owen, vice-chamberlain and baron of the exchequer of North Wales. In pursuance of this commission, eight of the band were seized and punished. To revenge this severity, Mr. Owen was waylaid and murdered when returning from the Montgomeryshire assizes (A.D. 1556), at a place now called, from the deed, Liydyaer-y-Bawn, the baron’s gate. "The vigorous measures to which this outrage gave rise led to the extirpation of the banditti, some of whom were executed, and the rest fled. The traditions of the country are the terror which these raiders excited. Travellers forsaken the common road to St Asaph to avoid their haunts. In the civil war of Charles I., Harlech Castle was the object of contention. The repeated captures of this place, and a skirmish near Dolgelley, which had been garrisoned for the parliament, were the only incidents of the contest which occurred within the county.

The principal remains of the middle ages are Harlech Castle, already described, and the ruins of Cymmer Abbey, near Dolgelley, with two or three smaller castellated build-
ings. Cymmer Abbey appears to have been founded about 1199, by two Welsh chieftains, for Castilian monks the yearly revenue at the dissolution was 5l. 13s. 4d. gross, or 5l. 13s. 4d. clear. Part of the church is still to be seen in a rich flat near the Maw, and shows the ancient greatness of the structure. The east end has three narrow pointed windows, and three smaller ones over it: it is mantled with thick ivy. The great hall and the abbots’ lodgings were used as a farm-house in Mr. Pennant’s time. Llyw Bradwen, between Dolgelley and Towy, is the ruin of a rude edifice, the house of an ancient Welsh chieftain; and near Llanfianghyd-Pennant are the remains of a castle supposed to be the castle of Bera, belonging to the last Llewelyn, prince of North Wales, and taken from him by William de Valence, earl of Pembroke, a short time previous to the final conquest of Wales.

Near the road from Bala to Dolgelley is Castell Corn- dochon, the ruin of a fortress of unascertained date.

(Pennant’s, Evans’s, andblinger’s Tours in Wales: Beauties of England and Wales; Parliamentary Papers; Greenough’s Geological Map of England and Wales; Walker’s do.; Arrowsmith’s Map of England and Wales, &c.)

STATISTICS.

Population.—Merionethshire is almost entirely an agricultural county. Of 1851 there were twenty years of age and upwards, 4899 are engaged in agricultural pursuits, and only 200 in manufacture or in making manufacturing machinery. These 200 are weavers of flannel and other woollens, distributed throughout the villages in small numbers, except that 70 of the men so employed reside at Dolgelley.

The following Table contains a Summary of the Population, &c., of every Hundred, as taken in 1831.

<table>
<thead>
<tr>
<th>HUNDREDS,</th>
<th>HOUSES.</th>
<th>OCCUPATIONS.</th>
<th>PERSONS.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Families</td>
<td>Families chiefly employed in Agriculture</td>
<td>All other Families not chiefly employed in the two preceding classes</td>
</tr>
<tr>
<td></td>
<td>Inhabited Families</td>
<td>Uninhabited Families</td>
<td>Building</td>
</tr>
<tr>
<td>Andudy Hundred</td>
<td>1960</td>
<td>2129</td>
<td>18</td>
</tr>
<tr>
<td>Eddy</td>
<td>1806</td>
<td>1036</td>
<td>8</td>
</tr>
<tr>
<td>Estman</td>
<td>832</td>
<td>925</td>
<td>11</td>
</tr>
<tr>
<td>Flawys</td>
<td>1392</td>
<td>1419</td>
<td>8</td>
</tr>
<tr>
<td>Tal-y-Bont and Morw-y-ddwy</td>
<td>886</td>
<td>882</td>
<td>1</td>
</tr>
<tr>
<td>Dolgelley</td>
<td>870</td>
<td>871</td>
<td>12</td>
</tr>
<tr>
<td>Militia under training</td>
<td>79</td>
<td>79</td>
<td>79</td>
</tr>
<tr>
<td>Total</td>
<td>6686</td>
<td>7338</td>
<td>53</td>
</tr>
</tbody>
</table>

The population of Merionethshire, at each time the census was taken, is as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1801</td>
<td>12,705</td>
<td>12,094</td>
<td>24,804</td>
</tr>
<tr>
<td>1811</td>
<td>17,479</td>
<td>17,090</td>
<td>34,569</td>
</tr>
<tr>
<td>1831</td>
<td>17,194</td>
<td>18,121</td>
<td>35,315</td>
</tr>
</tbody>
</table>

showing an increase between the first and last periods of 8103, or about 29 per cent. on the whole population, being 174 per cent. below the whole rate of increase throughout England.

County Expenses, Crime, &c.—The sums expended for the relief of the poor at the three following periods of—

<table>
<thead>
<tr>
<th>Year</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1801</td>
<td>17,479</td>
<td>17,090</td>
<td>34,569</td>
</tr>
<tr>
<td>1811</td>
<td>17,194</td>
<td>18,121</td>
<td>35,315</td>
</tr>
</tbody>
</table>

The amount expended was—

<table>
<thead>
<tr>
<th>Year</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1801</td>
<td>17,479</td>
<td>17,090</td>
<td>34,569</td>
</tr>
<tr>
<td>1811</td>
<td>17,194</td>
<td>18,121</td>
<td>35,315</td>
</tr>
</tbody>
</table>

The population in 1851 was 18,405. 11s., and was levied upon the various descriptions of property as follows:—

<table>
<thead>
<tr>
<th>Description of Property</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>On land</td>
<td>£17,436 5s.</td>
</tr>
<tr>
<td>Dwelling-houses</td>
<td>793 10</td>
</tr>
<tr>
<td>Mills, factories, &amp;c.</td>
<td>99 7</td>
</tr>
<tr>
<td>Manor and profuse, &amp;c.</td>
<td>76 9</td>
</tr>
<tr>
<td>Total</td>
<td>£18,495 11</td>
</tr>
</tbody>
</table>

For the relief of the poor, £15,247 6s.

In sums of law, removal of paupers, &c., 375 5

For other purposes, £2,442 16

Total 18,069 1

The returns made up for the subsequent years are as follows:—

<table>
<thead>
<tr>
<th>Year</th>
<th>Description of Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>1833</td>
<td>£15,747 11s. 4d.</td>
</tr>
<tr>
<td>1836</td>
<td>14,791 13s. 4d.</td>
</tr>
<tr>
<td>1841</td>
<td>£18,892 11s. 4d.</td>
</tr>
</tbody>
</table>

In the returns made up for the subsequent years, the descriptions of property assessed are not specified. In the returns for years 1834, 1836, 1837, and 1838, there were rated:—

<table>
<thead>
<tr>
<th>Year</th>
<th>Description of Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>1833</td>
<td>£15,747 11s. 4d.</td>
</tr>
<tr>
<td>1836</td>
<td>14,791 13s. 4d.</td>
</tr>
</tbody>
</table>

The returns made up for the subsequent years are as follows:

<table>
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<tr>
<th>Year</th>
<th>Description of Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>1834</td>
<td>£15,747 11s. 4d.</td>
</tr>
<tr>
<td>1836</td>
<td>14,791 13s. 4d.</td>
</tr>
</tbody>
</table>

The total money expended £16,007 5s. 16d. 111 8 10,015 10s. 4d.
The saving effected on the whole sum expended in 1838, as compared with that expended in 1834, was therefore £562. 5s., or about 18 per cent.; and the saving effected on the sum expended for the relief of the poor was rather more than eighteen per cent. in 1838 as compared with the expenditure in 1834.

The number of turnpike trusts in Merionethshire, as ascertained in 1833, under the acts 3rd and 4th Wm. IV., chap. 60, was 6; the number of miles of road under their charge was 264. The annual income arising from tolls and parish compositions in lieu of statute duty was (in 1833) £286. 14s., and the annual expenditure in the same year was as follows:—

<table>
<thead>
<tr>
<th>Description</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual labour</td>
<td>1,098</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Team labour and carriage of materials</td>
<td>139</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Materials for surface repairs</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Trade-men's bills</td>
<td>117</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Salaries of treasurer, clerk, and surveyor</td>
<td>257</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Law charges</td>
<td>712</td>
<td>19</td>
<td>0</td>
</tr>
<tr>
<td>Interest of debt</td>
<td>382</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>Deductions paid off</td>
<td>772</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Incidental expenses</td>
<td>260</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>Estimated value of statute duty performed</td>
<td>148</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total expenditure</strong></td>
<td><strong>1659</strong></td>
<td><strong>13</strong></td>
<td><strong>0</strong></td>
</tr>
</tbody>
</table>

The county expenditure in 1834, exclusive of the relief for the poor, was 1629. 13s., disbursed as follows:—

<table>
<thead>
<tr>
<th>Description</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridges, building and repairs, &amp;c.</td>
<td>724</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Gaols, houses of correction, &amp;c., and maintaining prisoners, &amp;c.</td>
<td>368</td>
<td>18</td>
<td>0</td>
</tr>
<tr>
<td>Shire-halls and courts of justice, building, repairing, &amp;c.</td>
<td>30</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Proctor's fees</td>
<td>174</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Clerk of the peace</td>
<td>163</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Conveyance of prisoners before trial</td>
<td>33</td>
<td>17</td>
<td>0</td>
</tr>
<tr>
<td>Constables, high and special</td>
<td>3</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Coroner</td>
<td>18</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>149</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total expenditure</strong></td>
<td><strong>1659</strong></td>
<td><strong>13</strong></td>
<td><strong>0</strong></td>
</tr>
</tbody>
</table>

The number of persons charged with criminal offences in the three septennial periods ending with 1820, 1827, and 1834, were 46, 25, and 63; making an average of 5 ± annually in the first period, of 3 ± in the second period, and of 9 ± in the third period. The number of persons tried at quarter-sessions in each of the years 1831, 1832, and 1833, in respect to which any costs were paid out of the county rates, were 2, 2, and 9 respectively. All these persons were charged with felonies.

The total number of committals in each of the same years was 2, 3, and 10 respectively; of whom 2, 2, and 8 respectively; and 1 respectively.

At the assizes and sessions, in 1837, 5 persons were charged with crimes in Merionethshire; out of which number none had committed offences against the person, 1 was charged with offences against property committed with violence, and 4 for offences against property committed without violence. The first offender was acquitted, and the remaining 4 were convicted. Of those convicted, 1 was sentenced to be transported for seven years; 1 to be imprisoned two years, or above one year; and 2 for six months or under. Of the offenders, 2 were males and 3 females. Among the whole number, 3 could read and write only imperfectly; and 2 could neither read nor write.

The qualified to vote for the county members in Merionethshire, as registered in 1837, was 1336. Of these, 711 were freeholders, 163 leaseholders, 504 occupying tenants, 10 trustees, 7 mortgages, and 1 servant; being one in 26 of the whole population, and one in 1 of the male population above twenty years of age, as taken at the census of 1831. The expenses of the last election of county members to parliament were, as usual, paid out of the general county-rate. There was not anw contest at the last election for the county.

There is one savings' bank in this county; the number of depositors and amount of deposits on the 20th of November, in each of the following years, were as under:—

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Depositors</th>
<th>Amount of Deposits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1832</td>
<td>620</td>
<td>£47,098</td>
</tr>
<tr>
<td>1833</td>
<td>670</td>
<td>£46,727</td>
</tr>
<tr>
<td>1834</td>
<td>447</td>
<td>£41,573</td>
</tr>
<tr>
<td>1835</td>
<td>435</td>
<td>£40,893</td>
</tr>
<tr>
<td>1836</td>
<td>503</td>
<td>£42,090</td>
</tr>
<tr>
<td>1837</td>
<td>555</td>
<td>£41,403</td>
</tr>
</tbody>
</table>

The various sums placed in the savings' bank in 1835, 1836, and 1837, were distributed as under:—

<table>
<thead>
<tr>
<th>Year</th>
<th>Depositors</th>
<th>Amount of Deposits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1835</td>
<td>620</td>
<td>£47,098</td>
</tr>
<tr>
<td>1836</td>
<td>670</td>
<td>£46,727</td>
</tr>
<tr>
<td>1837</td>
<td>447</td>
<td>£41,573</td>
</tr>
</tbody>
</table>

**Education.**—The following summary is taken from the Returns on Education laid before parliament in the session of 1835:

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of Schools</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily schools</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Number of children at such schools; ages from 4 to 14 years:—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>663</td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>359</td>
<td></td>
</tr>
<tr>
<td>Sex not specified</td>
<td>878</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1,890</td>
<td></td>
</tr>
<tr>
<td>Sunday-schools</td>
<td>172</td>
<td></td>
</tr>
<tr>
<td>Number of children and others at such schools; ages from 4 to 80 years:—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>3,462</td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>3,294</td>
<td></td>
</tr>
<tr>
<td>Sex not specified</td>
<td>7,114</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>13,800</td>
<td></td>
</tr>
</tbody>
</table>

Assuming that the population had increased between 1831 and 1833 (the period when the educational inquiry was made) in the same ratio as in the ten preceding years, and that the number of children between the ages of 2 and 15 bore the same proportion to the whole population as it did in 1821, then we find 11,753 as the approximate number of children living in Merionethshire in 1833. Ten Sunday-schools are returned from places where no other school exists, and the persons who attend them (615 in number) cannot be supposed to attend any other school. At all other places Sunday-school children have opportunity of resorting to other schools and are in what number or in what proportion duplicate entry of the same children is thus produced, must remain uncertain. Four schools, containing 260 children, which are both daily and Sunday schools, are returned from various places, and duplicate entry is known to have been thus made for treated. In some of the Sunday-schools there are adults and aged persons as well as children. Making full allowance, even for these two causes, for inaccuracy, it may perhaps be fairly estimated that nearly all the children are receiving instruction in this county.

**Maintenance of Schools.**

<table>
<thead>
<tr>
<th>Description of Schools</th>
<th>Description of Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Be endowed. By endowment.</td>
<td>By subscription.</td>
</tr>
<tr>
<td>Daily Schools</td>
<td>17</td>
</tr>
<tr>
<td>Sunday Schools</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
</tr>
</tbody>
</table>

The schools established by Dissenters, included in the above statements, are—

<table>
<thead>
<tr>
<th>Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily Schools</td>
<td>8, containing 246</td>
</tr>
<tr>
<td>Sunday Schools</td>
<td>161</td>
</tr>
</tbody>
</table>

The schools established since 1818 are—

<table>
<thead>
<tr>
<th>Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily Schools</td>
<td>23, containing 999</td>
</tr>
<tr>
<td>Sunday Schools</td>
<td>158</td>
</tr>
</tbody>
</table>

Four boarding-schools are included in the number of daily schools given above. No school in this county appears to be confined to members of the Established Church, or of any other religious denomination, such exclusion being
Mr. Bewick, "on the authority of the gaukekeeper at Wynstay Park, North Wales, that he had often seen the most of the Merlin, and that it built and bred there in the summer of 1726. "In the more southern counties of Cornwall and Devonshire the Merlin is considered to be rare, and only seen in winter. On our eastern coast it is killed, but not very often, in Kent, Essex, and Norfolk. The specimens observed are generally young birds, and these occur most frequently in autumn, or at the beginning of winter. In Ireland, according to Mr. Thompson, the Merlin is indigenous in several northern counties. It breeds also in Scotland, in O'kney, and Shetland. In North Wales the young birds are called Stone Falcons; but among ornithologists the Stone Falcon is considered to be an adult bird. It is not however improbable that the habit of sitting on a bare stone or portion of rock, by which this species has acquired the name of Stone Falcon, is common to it at all ages and in other countries." (Yarrell, loc. cit.)

The characteristic of the Merlin is thus summed up in the old French quatrains:

L'Emroit bleu
beau par extermite
A ie cuer gay, et fort hardy courage,
Et bien qu'il soit petit, il faut faire
A pourrayt se prouye au gazel.

The Merlin.

Upper figure, young male of the year, which the female, unless very old resembles; lower figure, adult male.

MERLIN, or, more properly, MERDIN. Some of the Welsh antiquaries speak of three Merlins: Merdlin Enyra, or Merlinus Ambrosius; Merdlin Wyllt, or Merlinus Calendarius; or Merdlin Sylvester, or Merdlin ap Mervyn, otherwise called Merdlin Avalonius (from a poem ascribed to him, entitled 'Avallénau,' or the Orkney), and also known by the Latin names of Melchizid, Melchis, and Mervynus. (Nicholson's Eng. Hist. Library.) It is generally agreed however that the second and third are the same person; and it is far from improbable that all the three Merlins are but one individual. Of Merlin Ambrosias the principal account we have is in Geoffrey of Monmouth's 'Historia Britonum,' where he is represented as a great prophet and enchantor, who flourished in the time of King Vortigen, or about the middle of the fifth century. This is the Merlin who is celebrated by many of our old poets, especially by Spencer, in the 'Fair Queen,' hook iii, and elsewhere; and he is also the subject of the English metrical romance of Merlin, of the first part of which there is a copy in the library of Lincoln's Inn, and a more ancient one, containing also a second part, in the Auchinleck MS., in the Advocates' Library, and of which Mr. Ellis has given an analysis, with extracts, in the first volume of his 'Specimens of Early English Metrical Romances.'
The Gadus Magellanicus of Forster and the G. Maraldi of Risso are mentioned by Cuvier as species belonging to the present genus.

M. ROE (Malacology), Schumacher's name for certain cowry-shells, Cylicum, turris, scutum,พฤติe, &c. M. ROE. (N.E.L.)

MERO/PIDE, a family of Fissirostral birds which, in the opinion of Mr. Vigors, is most nearly connected with the conterminous tribe, Tenouristes by the length, slenderer, finer, and downward curvature of the bill, which exhibits at first sight a decided discrepancy with the succeeding family of Hirundinidae, where the bill is short and wide; and that if we examine only the typical species of these particular birds, in the genera of the Eleonora there is a manifest distinction between them. Independently however of the general characters in which both families approach each other, such as the breadth of the rictus of the bill, the short and feeble legs, the strength of the wing, and the consequent habit of soaring, that consider chiefly in seeking their support, a gradual approximation is found to take place even in their bills; those of some of the extreme species of Merops becoming shorter as they approach Hirundo; while those of some of the latter group becoming longer and broader, the lengthening form of the bill of the Bee-eaters. The tail of Merops again is equally found to desert the typical characters of the group, namely, the greater length of the two middle feathers, in order to become even in some species, as it were, slightly for that length to become as lengthened as that fully forked tail of Hirundo. Mr. Vigors is further of opinion that among the Tenouristes the genus Promerop approaches nearest to the fissirostral group by means of Merops, the curved bill, and a more acute structure of its own. (V. On The Natural Affinities that connect the Orders and Families of Birds. Linn. Trans., vol. xv.)

Mr. Swainson (Classification of Birds, vol. ii.) is of opinion that the Meropidae, or Bee-eaters, succeed the Turdidae in both the Membrane and in the Membranous, that it annually visits Italy in flocks of twenty or thirty, and may be seen skimming over the vineyards and olive plantations with a flight much resembling the swallow, though more direct and less rapid. He observes that their bill is long, considered longer and more slender than that of Hirundo; and remarks that this difference is softened down by the intervention of the genus Eurytomus, containing the Swallow Rollers of India, Africa, and Australia, which have this organ very short. To these, he thinks, succeed the true Rollers, Coracias (Linn.), which are less slender and more slender, and the Bee-eaters, and associate also in small flocks. These two genera of Rollers, continues Mr. Swainson, are so indissolubly united, that nothing but the strongest prejudice in favour of a preconceived opinion could excite a preference for certain naturalists (whose labours in other respects have been of much advantage to science) to have placed them in two different orders. The whole structure of the Rollers, their lengthened pointed wings, and firm and often forked tail, at once induces the idea that they feed upon the wing; while their very short legs, scarcely longer than their hind toe, might have shown their incapacity to alight and walk, like the crows, upon the ground; but this question is at once decided by a knowledge of their economy, which, from personal observation, we have every reason to believe, is much like that of the Bee-eaters. The intervention of the Rollers at once lessens the abrupt transition, which would otherwise have been apparent, from the perfect-footed Swallows to the Fissirostral Bee-eaters; and we are thus prepared for the discovery of birds whose toes, as it were, are soldered together like those of the Meropidae. Here perhaps we may notice that most beautiful and rare genus Nyctornis, or Night-feeder, as being in all probability that particular form by which nature connects this family with the Bee-eaters, thereby uniting the three aberrant groups of the Tenouristes into one primary circle. M. Temminck, overlooking its particular structure, placed this genus with Merops, to which indeed it has a close resemblance; while its connection with Promeropidae in other respects is no less obvious. Its precise situation in short requires further investigation. See also Kingfisher and Merl.

Mr. Swainson gives the following character as distinct of the family:—

Wings long, pointed; the first quill as long, or nearly so, as any of the others.
And he arranges the following genera under it:—

Merops. (Linn.)

Bill very long, slender, slightly curved, compressed; the culmen rarinated; the tip entire, sharp, and not bent downward. Wings long, pointed; the tips of the lesser quills emarginate. Tail lengthened. Feet gressorial. (Sw.)

Example, *Merops apiaster*. [Bee-eater.]

Nyctornis. (Sw.)

Bill considerably curved, very long; the culmen with a parallel groove on each side. Wings rounded, convex. Plumage lax. Feet short, insessorial, resembling those of *Pteropus*. (Sw.)

Example, *Nyctornis amictus*.

Description. — Green; crown (in the adult) lilac; front of the throat and breast bright red. (Sw.) Total length about 13 inches, wings 5½, tail (beyond) 3, tarsi hardly half an inch. (Sw.)

Locality, India.

The lower, which is obliquely truncate. Nostrils basal, oblique, linear. Gape very wide, extending beneath the eye; the sides bristled. Feet insessorial, very short. All the toes cleft to their base; inner toe much the shortest. Wings moderate, pointed. (Sw.)

Example, *Coracias Abyssinica*.

Description. — White round the bill; body aquamarine green; back and wing-coverts cinnamon colour; shoulders, rump, and quills blue; tail green, the two middle feathers blue; two long loose processes terminating the two external quills.


Example, *Euryptomenus Orientalis*.

Description. — Colour aquamarine green; throat and point of the wing (foetus de l'aile) azure; quills and tail-feathers black; a white stripe upon the wing.

Locality. — Java, the south of New Holland, and all the Polynesian Islands. It is the *Ninox-viridis* of the natives of the neighbourhood of Sydney, *Dollar-bird* of the colonists, and *Tiong ba tu* of the inhabitants of Sumatra. — *Coracias Orientalis*, Linn.

Chloropygina. (Sw.)

General form between *Tumatai* and *Coracias*. Bill short; the tip not abruptly bent. Rictus bristled. *Nostrils* basal, linear, oblique. Wings short, convex, reaching only to the rump. The two first quills much graduated; the four next nearly equal and longest. Tail elongated, rounded, and broad. Feet as in *Coracias* Madagascar. (Swains.)

Example, *Chloropygins Leptosomus*. (Lesson, Wilt., Zool., pl. 32.)

Leptosomus. (Vieill.)

Bill about the length of the head, robust. The upper mandible curved and notched near the tip. Gonyx straight. *Nostrils* oblong, oblique; the margins elevated, naked, and placed towards the middle of the upper mandible. Feet short. Toes in pairs, as in *Tumatai*. Wings lengthened, pointed; the first and second quills longest. Tail moderate, even. (Sw.)

Example, *Leptosomus viridis*.

Locality. — The country of the Kaffirs and the coast of Zanzibar, where it is said to live in the forests on insects and fruits. The form is arranged by Lesson and others under the family *Cuculidae*. (Leptosomus)

Mr. Swainson makes the family of *Meropidae* the first of the *Passeriformes*. It immediately succeeds the *Paradisornis* and precedes the *Halyornis* in his arrangement.

M. Lesson, in his ‘Table Méthodique’, gives the following genera as constituting the family of the *Meropidae* :— *Merops*, *Alcedo*, *Dacelo*, *Cerys*, *Symo*, *Threskiornis*, *Mormops*, and *Bucerot*. See the articles *KINGFISHERS AND BIRD HILLS*. 
Saxe-Merseburg, of the Albertine line: at present it is used for the government offices; 3, the cathedral, founded in the eleventh century, in which the dukes of Saxe-Merseburg were interred; it has a fine altar-piece by Lucas Cranach, and one of the largest organs in Germany; 3, the cathedral school; 4, the monastery of St. Peter, in the suburb of Altenburg; 5, the palace of Count Zechi; 6, the military hospital; 7, the new town-hall. Several of the schools are likewise in the same buildings. There are manufactories of various kinds, and extensive breweries and distilleries. The trade of the place is considerable, and with the advantages derived from it being the seat of the government, it is a very flourishing town.

(Miller, Wörterbuch der Preussischen Staaten, 4 vols. 1856.)

MERSENNE, MARIN, a very learned philosopher and mathematician, one of the religious order of Minimes, was born in 1588 at Oyse, in the present department of Maine, and received his education at the college of La Flèche, where he was a fellow-student of Descartes, with whom he formed an intimacy which a similarity of pursuits ripened into a friendship that lasted only dissolved. He afterwards studied at the university of Paris, and subsequently at the Sorbonne. In 1612 he took the vows at the convent of Minimes, in the neighbourhood of Paris, and the year following received ordination as a priest, when he deemed it incumbent on him to study the Hebrew language, a thorough knowledge of which he acquired. In 1616 he was called to the chair of philosophy at Nevers, and there taught till the year 1619, when he was chosen superior of the convent, and on completing the term of his office he travelled into Germany, Italy, and the Netherlands. He finally settled in Paris, where his erudition, and his habit of conducting manners procured him a number of distinguished friends. Of these the chief was the founder of the Cartesian philosophy, who entertained the highest opinion of his abilities, and consulted him upon all occasions.

It has been universally admitted that the story seems highly improbable—that Descartes, by the advice of Mersenne, at once changed his intention of founding his system on the principle of a vacuum, and adopted that of a plenum. The discovery of the cyclotom has been ascribed to him and olngk, manners procured him a number of distinguished friends. Of these the chief was the founder of the Cartesian philosophy, who entertained the highest opinion of his abilities, and consulted him upon all occasions.

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work was, in 1648, translated into Latin and enlarged, by the author; but both the original and translation are now become as rare as they are curious to the antiquary and interesting to the musical inquirer.

MERSEY. [Cheshire, Lancashire.]

MERTHYR TYDFIL, or Tydfil, is a parliamentary borough and parish in the hundred of Caerphilly and county of Glamorgan, 18 miles south by east from Cardiff and 140 miles west-north-west from London (direct distances). The parish extends from north to south about 10 miles, and has a breadth of three miles comprising the hamlets of Forest, Garth, Gelldige, Taff-and-Cynon, and Hoechel-Wormwood. Part of the hamlet of Forest and part of the hamlet of Taff-and-Cynon are not included within the limits of the parliamentary borough; with this exception the constituency extends exactly to the parish. The river Taff lies in a valley to the left of the Taff river, but the houses are so scattered that it is difficult to say where it either begins or terminates; indeed there is not in the whole parish what can be correctly denominated a street. The houses themselves are for the most part of a very mean description, consisting chiefly of the cottages of labourers, beer and retail shops.

This place is said to take its name from Tydfil, or Tudfil, the daughter of the lord (regnum) of the name, who was murdered by a party of marauding Saxons. The church, subsequently erected near the spot, was dedicated to Merthyr Tydfil, or St. Tydfil the Martyr, in commemoration of the event. The present church is a neat edifice of the 13th century; it is in the diocese of Llandaff, and the living, a rectory in the patronage of the marquis of Bute, has a net annual revenue of 673L. Besides the parish church there is a chapel-of-ease, called Dowliai Chapel. The assessed taxes of the parish, in the year 1830, amounted to 140L. 15s. 1d.

Merthyr Tydfil was not represented in parliament till the passing of the 'Reform Act.' It now returns one member. The mining operations of this place were comparatively unimportant prior to the year 1753. About this time, however, a new and important works were commenced, and the greatest part of the mineral wealth of this part of the country was discovered. The mining operations commenced with coal, and the coal mines are yet the greatest part of the industry of the place. The quantity of coal produced in this parish for the year 1839 was estimated at 277,000 tons, which made in Staffordshire and the rest of England did not materially exceed 300,000 tons. (M'Culloch.)

The population of the parish, in 1831, was 22,083, but it is extremely fluctuating, a slight improvement or depression of the iron trade causing it to increase or decrease by thousands. A decrease in the iron trade had taken place shortly before the taking of the last census, and it may therefore be presumed that the number above given is less than the average population. The market-days are Wednesday and Saturday, which are held 13th May, 3rd September, 2nd December, and Trinity Monday.

(McCulloch, Statistical Account of the British Empire, &c.)

MERSEY, Oxford. This college was first founded at Maldon, in Sussex, in 1264, by Walter de Merton, bishop of Rochester and chancellor of England, who in 1274 removed it to Oxford.

Eis Longwy, count of Warick, is recorded to have been the owner of the manor about the year 1295. John Wyllott, D.D., chancellor of Exeter, gave exhibitions in 1380 for the maintenance of twelve portermates, called postmasters, who were afterwards increased to fourteen by John Chamber, fellow of New College, Oxford. It was decided that two additional exhibitions should be elected from Eton College. Chalmers says, 'On the building of the chapel these postmasters officiated as choristers, and had a salary of six shillings and fourpence per annum for this service; but there was at that time no regular choir.' These exhibitions, he adds, resided in a hall opposite to the college, which had been given to it by Peter de Abingdon, or Habendon, the first dean of the college, until the last of queen Elizabeth's reign, when they were taken into college. Henry Jackson, minor canon of St. Paul's, who died in 1727, and who had received his education at this college, founded four scholarships for natives of Oxford. His benefaction is not, however, of any considerable amount; for whatever reason, did not pass into effect until the year 1753.

The foundation, at present, consists of a warden, twenty-four fellows, fourteen postmasters, four scholars, two chaplains, and two clerks. The natives of the following dioceses are not admitted to fellowships: viz. St. Asaph, Bangor, St. David's, Llandaff, Hereford, Chichester, Exeter, Rochester, Lichfield and Coventry, Chester, and Carlisle. In the election of a warden the fellows choose three of their number, whom they present to the visitor, the archbishop of Canterbury, who appoints one of them.

The preference in the patronage of this college consists of the rectory of Gillinghay, in Cambridgeshire; the vicarage of Diddington, in Huntingdonshire; the vicarage of St. John the Baptist, in Oxford; the rectories of Castle and Holywell; the rectory of Farley, and the vicarage of Maldon, with the chapel of Chesham in Sutton, and the vicarage of Lapworth, in Warwickshire; and the vicarage of Stratton St. Margaret's, in Wiltshire.

Among the more eminent members of this society may be enumerated Duns Scotus; Bradwardine, and Islip, archbishops of Canterbury; Wivelis, who was a fellow of Merse; George Owen, physician to Henry VIII.; Jewel, bishop of Salisbury; and Leland, lexicographer and writer of a very important parliamentary general; Creasy, the Roman Catholic historian; Anthony à Wood, the Oxford historian; and Sir Richard Steele. Among the wardens, Dr. Chamber, another of Henry the Eighth's physicians; Sir Henry Savile; and Dr. Harvey, the discoverer of the circulation of the blood, have been the most conspicuous.

The endowments of this college consist of three courts; the outer one toward the street was rebuilt in 1589, except the tower and spire. At the same time a new and more spacious court was built. The ancient part of the college was built by Sever and Fitzjames, two of the wardens, afterwards bishops. The chapel, at the west end of the outer court, is also a parish church, dedicated to St. John the Baptist. It contains, among other commemorations, that of twenty-four fellows.

The number of members of this college, December 31, 1838, was 135.

(Gutch's Colleges and Halls of Oxford; Chairman's History of the University of Oxford; Oxford University Calendar, 1839.)

MERVELDA, Thruhers, a family of Dentisthral birds, placed by Mr. Vigors between the Laniidae, or Shrikes, and the Sylviadae, or Warblers. In the former family, he is of opinion that Vanga, Cuv., together with Prinomis, Laminaria, and Thamnophilus, allied to the Thrushes, and that the extremes of the family will be found in Gruaculor and Collypetes of Cuvier, which last genus is here very nearly allied with the Thrushes, and both of which, by the same author, in some degree, lead back to Tyrannus, and the other broad-billed genera which commence the family. Mr. Vigors feels inclined rather to leave Collypetes in its original station among the Starlings, from the peculiarity of its tail-coverts, which form themselves into a kind of puffed-out cluster on the back.

'The family of Merulidae, continues Mr. Vigors, ' connected as above with the Laniidae, comprises a considerable number of species, and many of them are birds which, like most of the Inessorial groups, have hitherto received but partial examination. The general views by which they seem to be allied among themselves, as far as least as can be judged from their present unorganised condition, may be stated as follows:—but with that expression of the base which over attends inquiries like the present, may where the
Feet small, weak, lateral toes equal, hinder toe as long as the tarsus.


Chloropais (Jard. and Selb.). Bill more lengthened: the tip much hooked; the notch of the upper mandible forming a small distinct tooth. Rictus of gape smooth. Feet small, lateral toes unequal, the hinder toe shorter than the tarsus. (Sw.)


Jora, or Jora (H. Sch.); Bill nearly as long as the head, lengthened, somewhat conic, and rounded. Rictus smooth. Tarsus rather lengthened, the anterior scales divided. Middle and hinder toe of equal length. Tarsus much longer than the head. Tail very short, fasciculated, the tips truncate and even.

Example, Jora scapularis, Horsf., *Java.*

Andropodus (Sw.). Bill very short, resembling that of Brachypus, but the upper mandible crested near the tip. Neck with scutaceous hairs. Rictus bristled. Wings, tail, and feet as in Brachypus. (Sw.)

Example, Andropodus vociferus, *Ois. d'Afr.*, 106, f. 2.

Hematornis* (Sw.). Head crested. Bill short. Rictus bristled. Feet short, lateral toes unequal, hinder toe shorter than the tarsus, the innermost toe equal to the middle toe. Wings and tail rounded. (Sw.)

Example, Hematornis chrysothorax, *Ois. d'Afr.*, 111, pl. 107, f. 2.

Tricophorus. (Tremm.)

Culmen gradually arched. Nostrils and base of the bill surrounded with long penciled alar bars. Gape very strongly bristled. Margins of the mandibles white. Feathers of the crown and chin elongated. Nape of the neck with several conspicuous lengthened bristles, considerably exceeding the surrounding feathers. Feet short. Tarsus longer than the hind toe, and feathered beyond the knees. Inner toe shortest. Wings and tail moderate, the former with the three first quills much graduated.

Example, Tricophorus olivacea. (Swainson, *Birds of West Africa*, i., 249.)

Phyllostathrepus. (Sw.)

Bill as long as the head, strong, the tip rather hooked. Rictus strongly bristled. Frontal feathers small, compact, directed forwards, and compressed on the base of the bill. Wings and tail moderate, rounded. Feet short, strong, robust. Tarsus and middle toe of the same length; lateral toes unequal, the inner shortest: hinder toe shorter than the inner one. Anterior tarsal scales divided. (Sw.)


Icteria. (Vieill.)

Bill with the general form of that of Brachypus, but the culmen more elevated and arched, and both mandibles entire. Wings and tail rounded. Tarsus considerably lengthened and strong, the inner toe the shortest; middle toe very long. Locality. America.

Example, Icteria polyglottla. (Wilson, pl. 6, f. 2.)

Subfamily Myotherinae (Myotherinae).—Ant-Thrushes.

Bill straight, somewhat cylindrical; the tip suddenly bent down or hooked.

Dasycephaia. (Sw.)

Bill as long as the head, straight; tip abruptly hooked, base wide, the rest somewhat cylindrical. Gonya strongly ascending. Nostrils and front defended by stiff feathers and bristles, pointing in different directions. Rictus strongly bristled. Tarsus lengthened, slender: lateral scales numerous, small, oval. Toes and claws slender; inner toe shortest; outer toe connected to the hind toe as the first joint. Hind claw large. Wings and tail rounded.

Example, Dasycephaia rufescens. (Birds of Brazil, pl. 76.)

Myotheria. (Ill.)


Subgenus Myothera. Inner toe longer than the outer and cleft to its base; outer toe with its first joint united to that of the middle toe. The tarsus with the anterior scales divided.

Drymophilia. (Sw.) Inner toe shorter than the outer,
which is only slightly connected to the middle. Tarsus (typically) very smooth: all the scales entire. (Sw.)

Example, *Dryomophila longipes*. (‘Zool.’, Ill., ii. 23.)

Brouckerypura (Horsf.). See the article.

*Mycotrocha* (Sw.). Legs strong. Inner toe longer than the outer. All the tarsal scales divided. Anterior claws small; hinder claw nearly straight, and as long as the toe. (Sw.)


*Pityes* (Vieill.). Feet syndactylite. The inner lateral toe shortest; the outer united by its first and second joint to the middle toe. All the tarsal scales entire.


N.B. Mr. Swainson remarks that *Uromos*, *Formicitoria*, and all the other small *Mylitta*, having the feet weak and the claws small, are largely the result of Thamnophus, he thinks it better to refer them to that group; but as it has not been analyzed, he does not, in the Classification of Birds, incorporate those two subgenera, although proposed by himself some years ago. See Zoological Journal, vol. i., p. 361; and the paper On the Natural Affinities which connect the Orders and Families of Birds, by Mr. Vigors, who refers to Mr. Swainson’s memoir in the ‘Zoological Journal,’ and observes that the reader may there see the true connexions between these and the orders of the Insects. (Sw.)


*Pityes* (Vieill.). ‘Gal.’, pl. 129.

Pitta. (Temm.)

Bill strong, thrust-like: the culmen gradually curved. Nostrils nearly naked. Wings moderate; the first and second quills graduated; the first as long as the culmen. Tail remarkably short; almost hid by the covers. Feet very long, pale, the scales nearly entire. Inner toe slightly shorter than the outer. India and Australia. (Sw.)


Subgenus *Cloris* (Sw.). Bill as in *Pitta*, but somewhat thicker. Nostrils protected and nearly covered by incumbent feathers. Rictus bristled. Wings rounded; the four first quills much graduated. Tail moderate or lengthened, graduated. Feet strong, rather lengthened: the inner toe scarcely shorter than the outer. India. (Sw.)


Graillaria (Vieill.). Bill thrust-like, as in *Pitta*. Wings rounded; the two first quills graduated, the first half as long as the second, the three next nearly equal. Tail short and rounded. Legs very long; the tarsus slender, pale; the anterior scales divided, the lateral scales (typically) entire. Lateral toes nearly equal.

B. *Graillaria* (Vieill.), ‘Ent.’, 702.

Mr. Swainson remarks that it appears to him that *Chamaecoza*, Vig., is more an aberrant species of *Graillaria* than a distinct type in the genus *Pitta*: the only species known distinctly in having the tail longer and the lateral scales divided.

Cinculus. (Bech.)

Bill moderate, rather slender, very straight, considerably depressed; tip absolutely notched; gonyx ascending. Nostrils naked, membranaceous; the aperture very small and linear. Wings moderate, rounded; the first quill spurious. Tail very short. Feet large, very strong, pale; the lateral toes equal; tarsal scales entire and smooth. (Sw.)

Example, *Cinculus albicollis*. Selby, pl. 45.

Subfamily Merulinidae. True Thrushes.

Wings more lengthened and pointed. Bill notched, with the culmen gradually curved to the tip, which is bent, but not hooked, over the lower mandible. Feet formed both for perching and walking. (Sw.)

Petrocincla. (Vig.) Rock Thrushes.

Bill thrust-like: tip of the upper mandible abruptly bent down and nearly entire. Wings moderate; the first quill spurious; the second shorter than the three next, which are equal and longest. Tail even. Anterior scales divided. Lateral toes equal. Claws small, but slightly curved.


Subgenus *Petrophila*. (Sw.). Bill thrust-like: the culmen and tip of the upper mandible gradually bent and entire. Wings and tail as in the last. Legs pale; anterior scales entire; inner shorter. Claws moderate and fully curved. (Sw.)
bristled. Wings very short; the two first quills graduated, the four next all of the same length, and longest. Tail lengthened, graduated; the feathers narrow. Feet very large and strong. Toes lengthened; the inner toe too rather longer than the outer. Claws slender, and but slightly curved. An anterior scale, lateral, entire.

Example, *Megalurus palustris.*

*Pomatorhinus* (Horsf.). General structure of *Crateropus,* but both mandibles of the bill curved and entire, and the wings shorter and much more rounded; four first quills graduated. Tarsal scales entire. Inner toe rather shorter than the outer.

Example, *Pomatorhinus montanus.*

*Timalius* (Horsf.). Plumage lax. Bill straight, rather short. The mandible very high and arches gradually; tip obsoletely notched or entire; commissure curved. Wings short, rounded. Tail more or less lengthened, graduated. Feet strong. Lateral toes nearly equal.—India, Australia, Africa. (Sw.)

Example, *Timalia thoracica.* (Pt. Col., '76.)

*Pteropodis.* (Kittlitz.)

Feet of extraordinary size and thickness; all the anterior toes nearly equally long; claws long, slender, slightly curved. Tail consisting of fourteen feathers, rounded and carried erect. Wings very short. Representing *Memura* and *Orthomys.*—Western Tropical America only. (Sw.)

Example, *Pteropodis megapodus* (Kittel, pl. 4. 'Zool., III, ii., pl. 117.)

Subfamily *Oriolinae.* Orioles.

Bill thrush-like, as long as the head, broad at the base, compressed beyond; the base and gape devoid of bristles. Nostrils naked; aperture large. Wings lengthened. Rump feathers thick. Lateral toes unequal. (Sw.)

*Donacobius.* (Sw.)

Habit and general structure of *Crateropus.* Bill lengthened, slender; the culmen arched from the base; the tarsus hooked and notched. Nostrils large, naked, membranaceous; the aperture large, oval, terminal. Wings remarkably short, and rounded. Tail moderate, broad, cuneate. Feet very large and strong. Lateral toes equal; claws slender, acute, slightly curved. Distribution.—America (Tropical). (Sw.)

Example, *Donacobius vociferans.* ('Zool., III, ii., pl. 72.)

*Sericulus.* (Sw.)

Bill rather stout, resembling that of *Oriolus.* Nostrils naked. Wings moderate; first two quills equally graduated; third nearly as long as the fourth. Tail moderate, even. Feet strong, robust. Tarsus much longer than hind toe and claw; inner digit shorter. Australia. (Sw.)

Example, *Sericulus chrysocephalus.* (Lewin's 'Birds of New South Wales,' pt. 1.)

*Oriolus.* (Linn.)

Bill as long as the head; broad at the base; tip distinctly notched, and somewhat hooked. Nostrils short, nearly naked; aperture lateral, large, and oval. Wings rather lengthened; first quill very short; second not quite so long as the third, which is generally the longest. Tarsus rather short, longer than the hind toe and claw; anterior scales divided.—Old World. (Sw.)

Example, *Oriolus guttulus.* (Snr., 'Enl., '66.)

*Subgenus Irus.* (Horsf.). Bill of *Oriolus,* but the culmen much raised and considerably arched from the base, rather hooked at the tip. Nostrils partly defined by short plumes, which cover the membrane. Rictus slightly bria ted. Tail as in *Crateropus.* Feet small. Tarsus very short, scarcely longer than the hind toe and claw; anterior and lateral scales entire. Inner toe rather shorter. Rump feathers very thick, and slightly spinous.—India.

Example, *Irena puella.* (Horsf., 'Java.' 'Pt. Col., '70.)

*Dulus.* (Viell.)

"Bill very short, much compressed, but with the culmen elevated and arching curved; the culmen well marked in *Dulus,* and *Oriolus.* Wings rather short; first quill not half so long as the second; third, fourth, and fifth longest; secondaries with the tips notched; tertials lengthened. Tail moderate, slightly forked. Feet as in *Oriolus.* Claws strong, broad, much curved.—South America.

Example, *Dulus palmarius.* ('Enl., '156, f. 2.)

*Sphenocercus.* (Viell.)

Bill rather short, strong; partaking of the structure both

u. *Dulus* and *Oriolus;* the base broad; commissure straight, gape very wide, extending beyond the eye. Nostrils naked, the aperture large and oval. Wings, tail, and feet as in *Dulus.* Tarsus hardly longer than the hind toe and claw. Australia.

Example, *Sphenocercus viridis.* (Viell., "Gal.," pl. 147.)

M. Lesson, in his 'Table Méthodique,' makes the *Turdisi rés,* the fifth family of the Dentirotal birds, consist of the following genera:—

*Turds* (Linn.), including *Merula,* *Turdus,* and *Ixos;* *Cinclodes* (?); *Cinclus* (?); *Nothura;* *Timalius;* *Dendroica;* *Jora;* *Pitta;* *Myothera;* *Brachypteryx;* *Gala*; *Acrisothres;* *Pardina;* *Mintes;* *Oriolus;* and *Sericulus.* The position assigned to the family is between the *Anomalidae* and the *Membrineae* (Munroa).

The Prince of Salm-Salm, in his "General, Historical and Comparative List of the Birds of Europe and North America" (1838), places the 'Turdide' between the 'Coridide' and the *Muscicapidae,* and assigns to the first the following sub-families and genera:

Subfam. a. Calamotherpinae.

Genera—*Catta* (Bonap.); *Pseudo-lucinia* (Bonap.); *Locustella* (Ray); *Calamodyta* (Bonap.); *Cypsiola* (Les.).

Erythropsygia (Smith, *Agrobates,* Sw.); *Calamotherpa* (Meyer); *Hippolaec* (Brem.). These are for the most part formed at the expense of the genera *Sylvia* and *Mota cola* (Linn.).

b. *Sylvaninae.*

Phyllophoena (Meyer, *Phyllophoena,* Boie); *Melophoena* (Lesch); *Sylvia* (Lath.); *Curruca* (Brissom); *Nisoria* (Bonap.); *Accentor* (Bechst.); *Calliope* (Gould); *Lucinia* (Br., *Pluviona*). (Sw.)

*Sericulus.*

*Dondada* (Boie, *Rathcaa,* Sw., *Rubecula,* Br.); *Rudilla* (Br., *Phanocera,* Sw.); *Sericada* (Bechst.); *Viucca* (Briss., *Gonanthe,* Viell.); *Sidula* (Sw.); *Petrocinia* (Vig., part); *Petrocosmus* (Boie).

d. *Oriolinae.*

*Oriolus* (Linn.), e. *Turdinae.*

*Merula* (Ray); *Turdus* (Linn.); *Orociaecola* (Gould); *Minua* (Boie, *Orphes,* Sw.); *Cinclous* (Bechst.).

f. *Motacillinae.*

*Anthus* (Bechst.); *Botystes* (Cuv.); *Motacilla* (Linn.).

g. *Perinae.*

*Regulus* (Ray); *Parus* (Linn.); *Mecistura* (Lesch, *Paroidea,* Brem.); *Calumiphonia* (Lesch, *Mystacinus,* Brem.); *Agithala* (Vig., *Pendulina*). (Cuv.)

h. *Sylvicolineae.*

*Parula* (Bonap.); *Trichas* (Sw.); *Verminora* (Sw.); *Setura* (Sw.); *Sylleotis* (Sw.); *Willorna* (Bonap.); *Culturina* (Sw.).

We have thus endeavoured to lay before the reader the views of some of the leading ornithologists respecting the arrangement of the Thrushes. The student will find a very extensive and well-arranged collection of the family in the museum of the Zoological Society of London.

**MERLIUS,** a genus of Fungi, deriving its name from *Merula,* a blackbird, some of the species being black. The character of the genus is to have a very visous or slimy plated hyphium, with the spores contained in the pileus, and forming angular unequal perforations. Its only interest is derived from one of the species being a common cause of dry-rot. This plant, the *Merulius larchymns* of Fries, and the *Boletus larchymns* of *Sowerby's Fungi,* t. 135, is very common on rotten wood in vaults and cellars, being the timbers of ships, and in similar damp situations where there is not a free circulation of air. In general it is found without fructification, its thallus, or spaw, being the only part developed, and growing as a white, dry, cottony matter, consolidated into a substance like leather. The fructification is composed of fine yellow orange or reddish-brown picoles, so arranged as to have the appearance of perforations, and occasionally producing 'pendent processes like inverted cones;' it usually forms a circle varying from one to eight inches in diameter, and when perfect the cavities contain drops of clear water, which have given rise to the specific name. The only known means of preventing the attacks of this and other fungi upon timber is a free circulation of dry air, or the impregnation of wood with corrosive
MERYCOTHRIUM, the name applied by M. Bojanus to a genus of fossil Mammalia, founded on three fossil teeth, according to the authority of the person who sold them to him. Bojanus records one species under the name of Merycothrium (Merycothrium). Cuvier remarks that if these teeth are really fossil, and from Siberia, this would be the first authentic example of such remains belonging to the genus Camelus. He observes that their size, their form (which is longer than it is broad), and the presence of a right or small antler, and the space between the columns, leave no doubt as to their generic character. Those of the Giraffe are more square, and with a small point, as in the stag; while those of the Ox have a cylindrical 'ärte,' or ridge. Cuvier further states that Bojanus who has very well remarked this general resemblance, has also noticed some differences which have appeared to him sufficient to justify a new name for the animal; but the French zoologist observes that Bojanus proposes this distinction with doubt, and declares his readiness to renounce it, if it should be established that these teeth belonged to a camel, a gigantic sheep, or an antelope (the only genera in which the animals are found). Cuvier thinks that the differences of which Bojanus speaks are owing to the skulls of the Camels examined by the latter, as points of comparison, being the heads of individuals much older than that with which the teeth in question belonged. A Dromedary only a little older, and whose teeth were nearly in the same state of detritus, appeared to Cuvier to present no difference, a fact which he attributes to their being the heads of individuals of different age. He remarks that they are, as Bojanus truly pointed out, the penultimate and antepenultimate molaris of the left side of the upper jaw, and that it remains to show in what beds they were found, and to search for other bones of the animal, in order to see if they would fit a recently-specified character. Cuvier concludes by stating that M. Marcel de Serres, professor of mineralogy at Montpellier, had just communicated to him a drawing of a fossil femur from the environs of that city, which resembled much, in the parts of it which were preserved, that of a Camel. [CAMEL, vol. vi., p. 191.]

Notwithstanding Cuvier's opinion, which is worthy of all respect, there are those who still think that Merycothrium is a distinct genus. See Bojan's, 'Nov. Act. Acad. Leop. Nat. Cuii, vol. xiii., p. 191.'

MERZLIAKOV, ALEXIUS PHEDOROVITCH, a Russian writer, more distinguished as a critic than as a poet, though not without talent in the latter character, was born at Dalmauia in the government of Perm (where his father was a wealthy merchant), in 1775. In his fourteenth year he recommended himself to Catherine II. by an ode on the peace with Sweden, and the empress ordered him to be sent to the university of Moscow, where he was placed under the direction of the Spanish [Knyazov], and in 1792, when he was made professor of eloquence and poetry. In 1805 he quitted Moscow for the northern capital, where he held a similar professorship in the university. He was at St. Petersburg that, at the suggestion of Prince Galitzin, he commenced a popular course of lectures on literature, which were numerously attended, and obtained for him a high reputation with the public. These lectures, which were held twice a week during the winter at Galitzin's house, were then a novelty, and were more interesting to his audience, because the critic discussed at length the merits of the principal Russian poets and prose-writers.

His own productions consist chiefly of translations, among which are Aristotle's 'Poetics,' Virgil's 'Eclogues,' select scenes from 'The Greek tragedy, Eschylus's 'Tency of Literature,' and Tasso's 'Jerusalem.' Among his original poems, his shorter lyric pieces and songs are the best, the latter more especially, for they breathe the strong national feeling, and have accordingly acquired more than a transient vogue. [Merycothrium, 1826 or 1827.]

MESAPUS. (Zoology.) [SALICOCOUS.]

MESEMBRYACCEA, a natural order of Polypteralous Exogens, consisting of herbaceous and shrubby plants inhabiting various parts of the world, in very dry temperate climates, as the Cape of Good Hope, where this species are extremely numerous. They are succulent plants, with an inferior, many-celled, polyserous ovary, numerous narrow petals, indefinite stamens, and a fruit splitting into regular stellate valves. The common fice-plant of the gardens, Mesembryanthemum crystallinum, so called because its cuticle is elevated in the form of multitudes of crystalline points, is burnt in the Canary for the sake of its ashes, which the Spaniards import in large quantities for their glass-works under the name of Barilla Moradere. Another species, the M. modestorum, is used in Egypt for the same purpose, and also in the manufacture of Marocco leather. This and the other species are chiefly found in sandy, desert, arid places, where they flourish in the absence of other vegetation, and afford a grateful food to cattle, which browse upon them. M. emerisium, according to Gmelin, is found in the Pamir-touma, when it becomes narcotic, and is chewed by those people like tobacco. Only four genera seem admissible into the order; the others referred to it under the name of Ficoides chiefly belonging to Tetragoniacceas; but Mesembryanthemum, one of the admitted genera, alone comprehends more than 30% species.

MESENTERIPOURA. [POLYPIRIA MEMBRANACEA.]

MESENTRY is the membrane by which the intestines are attached to the posterior wall of the abdomen. It consists of a double layer of fine cellular and adipose tissue, which is attached to the abdominal wall by a comparatively narrow origin, and becoming gradually wider, spreads out like a fan, to be attached to the whole length of the canal of the small intestines. Between its layers the arteries pass to the intestines, and the veins and lacteals return from them.

The other abdominal organs are attached to the walls of that cavity and to each other by layers of membrane similar to the mesentery. Those which belong to the colon are called the meso-colon; those of the rectum the meso-nutrum, &c.; while those which connect the stomach with the spleen and liver are named respectively the gastro-splenic and the gastro-hepatic, or lesser omentum.

MESMER. [ANIMAL MAGNETISM.]

MESODESMA, M. Deshayes's name for a genus of Vlanders. [Bryonia. Linn.]

MESOLABIUM, an old name for any geometrical cone structure or proportion for finding two mean proportions between two given lines.

MESOLE occurs massive and globular or reniform. Structure radiating from a centre, fibrous, foliated. Hardness 3½. Colour white, greyish, or yellowish white. Translucent. Lustre pearly or silky. Specific gravity 2·35 to 2·4. It is found in Sweden and the Faroe Islands.
M E S

M E S

Analysis by—

Hilger...

Bernaum.

Silica 42·45 N.

42·60

Alumina 27·00

28·00

Lime 17·19

5·63

Soda 9·00

11·43

Water 11·77

12·70

100·13 100·36

MESOLITE (Neckle-stone) occurs crystallized and mass.


Before the blow-pipe it becomes opaque, swells, and often fuses into a colourless glass; with borax it fuses difficultly.

It occurs in Iceland, Greenland, Finland, &c.

Analysis by—

Fuchs and Gmelin.

Bernaum.

Silica 47·0 45·80

Alumina 25·9 26·50

Lime 9·8 9·87

Soda 5·4 5·40

Water 12·3 12·30

99·8 99·87

MESOPHYX. M. Räutsch's name for a genus which he proposes to separate from Helix of ausschließlich.

MESOPOTAÏMIA (Mesopotamia, called in the Old Testament Aram-naharaim, אַרְעַם נָהֲרוֹאִים, that is, 'Aram, or Syria between the two rivers'), the ancient name of the country lying between the Tigris and Euphrates, was bounded on the north by Mount Masius (Karajeh Dagh), a branch of Mount Taurus, and on the south by the Median wall and the mountains which connected the Tigris and Euphrates, by which it was separated from Babylonia. (Strabo, xvi, p. 746, Cassabon ; Plin., v. 18; Plin., v. 13, vi. 9.)

The name of Mesopotamia, which was never employed to designate any political division, did not come into use till after the time of the Macedonian conquest of Asia. In the southern part of Mesopotamia Xenophon calls Arabia (Abnab, i., 5 § 1); and other writers included it, especially the northern part, under the general name of Syriac. (Strabo, p. 737.)

It was considered by the Romans a division of Syria. (Meila, i., 11; Pliny, v. 13.) It is called by the Arabs in the present day Al Jezira, the 'island.'

Mesopotamia may be divided into two parts, the physical features of which differ greatly. The northern part, from Mount Amor to a point 20° N. lat., is a country watered by the Chaboras and the Mygdonis; the southern part, from the neighbourhood of Cirecius to the Median wall, is a flat and desert country, which Xenophon has described in the 'Anabasis.' The country, he says, 'was a plain throughout (1. 5, § 9), level as the sea; soil of vernal wood (άνθρακας); whatever other shrubs or reeds it contained had all a sweet aromatic smell, but there was no timber in it. There were all kinds of wild animals in it; the most numerous were wild asses, and not a few ostriches; there were also in it bustards and antelopes.' It was inhabited in the time of Piny and Strabo by predatory tribes of Arabs called Sceniti, who were afterwards known under the name of Saracens. (Strabo, xvi, p. 747; Pliny, vii, 28, xiii.)

Little is known of the history of Mesopotamia till it became a province of the Persian empire. Cuchan-rithka-thaim, who is mentioned in Judges (v. 8, 10) as king of Mesopotamia, appears to have been only a petty prince of a district of the Euphrates. In the time of Hezekiah the different states of Mesopotamia were subject to the Assyrians (2 Kings, xix, 13), and subsequently belonged in succession to the Chaldean, Persian, and Syro-Macedonian monarchies.

The northern part of Mesopotamia was divided into two parts by the river Aboras or Chaboras (Khobar), called Arenas by Xenophon (Anab, i., 4, § 19), which rises in Mount Masius, and receiving the Mygdonus (al Hualit) on the east, flows into the Euphrates at Cirecius. Of these districts the western was called Osrene, and the eastern Mygdonia.

The chief town of Mygdonia was Nisibis, also called Antiochia Mygdonica (Ninibin), situated on the river Mygdonius, in the midst of a fertile plain at the foot of Mount Masius. It was surrounded by three brick walls, and was very strongly fortified. Sapor was repulsed in three separate attacks upon the town, A.D. 328, 346, 348; but it was ceded to him by treaty in 363. The Zoba of the Old Testament (1 Sam. xiv. 7; 2 Sam., viii.) is supposed to be the same town as Nisibis, since the Syriac writers frequently identification Nisibis under the former name. To the north of Nisibis was Dara (Darra), which was fortified by Anastasia I. (A.D. 506), who gave it the name of Anastasiopolis. (Procop., Pers., i. 10.) According to Niebuhr, there are still considerable ruins both of Nisibis and Dara.

The chief town of Osrene was Carra (Karran), in the north-west of the province, nine geographical miles from the Euphrates. This town, which was also called Antiochia and Callirrho (Plin., v. 21), is supposed to be the Ezech (אֶזֶכַת) of the Old Testament. (Gen., xix. 10.) Edessa suffered greatly by an earthquake in the time of Justinian, who rebuilt a considerable part of the town, and gave it the name of Justinopolis. Orba was plundered by the army of Timur in 1393; but it soon recovered its former importance. It contains at present about 40,000 inhabitants; and is about three miles in circumference.

At the distance of two days' journey, according to Niebuhr, south-east of Osrene, was the town of Harran (Haran), the Haran of (אֶזֶכַת) of the Scriptures, where Abram's family dwelt after they had left Ur of the Chaldees. (Gen., xi. 31; xii. 5; xxv. 43; xxv. 10; xxix. 4.) In the time of Hezekiah, Haran had been conquered by the Assyrians. (2 Kings, xix. 12; Is., xxxix. 12.) It is mentioned by Ezekiel as a place of commercial importance (Ezek., xxvi. 23). Haran is memorable in Roman history for the defeat of Crassus. (Dion. Cassius, xii. 25; Pliny, v. 21; Lucret., i. 104.)

Cirecius (Cerkesia), at the union of the Euphrates and Aboras, was a very ancient town: it is called Carcemenia (נָהֲרוֹאִים) in the Old Testament. (Is., x. 9; Jer., xlii. 2; Chron., xxxv. 20.) It was strongly fortified by Diocletian. (Ammian., xxiii. 5.) A little to the north of Cirecius, near Thapsacus, was an ancient ford across the Euphrates.

MESOTYPE (Natrolite) occurs crystallized and mass.


Massive varieties globular and reniform. Structure fibrous, diverging. Lustre pearly.

By the blow-pipe fuses with ebulition into a spongy amorphous gelatinous mass of caustic acid.

Found in Ireland, Scotland, Iceland, the Faroe Islands, &c., in trap, basaltic, and porphyritic rocks, and also in the cavities of the more ancient lavas of Vesuvius.

Analysis of a specimen from Faroe by Smigovitz—

<table>
<thead>
<tr>
<th>Material</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica</td>
<td>49·0</td>
</tr>
<tr>
<td>Alumina</td>
<td>37·0</td>
</tr>
<tr>
<td>Soda</td>
<td>17·0</td>
</tr>
<tr>
<td>Water</td>
<td>9·6</td>
</tr>
</tbody>
</table>

102·6

MESIPILUS is a genus of Pomaceous plants, distinguished from Pyrus by the calyx of the carpels being bony, and their points spread open so as to give the fruit a cup-shaped appearance. In this restricted sense it is confined to those fruit-trees which are vulgarly called Medlars, whose astringent fruit does not soft on the tree but becomes easily to and is known to arrive at that stage of decomposition which is called bleeting. The word Mesipilus has however been sometimes employed as a general name for all Pomaceous plants whose fruit has a hard pumilus; it was used in this sense by Dioscorides, who is pumilus δια θρεψ, or ροσοεδο, was either

Cratagus tanacetifolia, as Sibthor believed, because he found that species still called ροσοεδο by the modern Greeks, or C. Aronia, as Sprengel conjectures; while his μεσιπιλους or Ιωραθος, was the modern Mesipilus germanicus, or common wild rose, which may be described particularly.

There are only two species of Mesipilus proper one Mesipilus grandifolium, an ornamental tree common in shrubberies; the other M. germanicus, a native of the woods.
and wild places of middle and southern Europe, which furnishes all the varieties of Medlar. These are the Large Dutch, the Nottingham or Common, and the Stoneless. The first is preferred on account of its large size, but the Nottingam possesses the finest acidity; the Stoneless is easily distinguished by its small size and the character implied by its name. The trees may be propagated by either grafting or budding upon their own species, or upon the White Thorn. By some writers a different description is given of the last; the straightest stems can be obtained. The branches of the Medlar naturally assume so tortuous an appearance, that any attempt to produce uniform regularity by pruning would only be successful. Pruning should be performed only with a view to general symmetry, the balancing of the top (which is apt to incline all to one side), and a judicious thinning where the branches are overcrowded. It is necessary to observe that the fruit is produced at the extremities of the branches, and therefore in pruning they must not be shortened.

The fruit, when first gathered, is extremely astruse; but this astringency is changed soon after gathering into an agreeable acidity. When in a soft pulpy state, it is fit for use, and, preserved by the tough skin, will continue so for some time; but a sort of mouldiness generally makes it appear at the stalk, and as soon as it is observed the fruit may be pronounced unfit for use. Dipping the stalk in brine would be very injurious, so as to prevent the attack of fungic on that part.

Mesplius japonica, the Loquat, is now called Eriobotrya japonica, Mesp. Amelanchier is Mesp. Amelanchier vulgaris, and M. Cotoneaster is Cotoneaster vulgaris.

M E S S A L L A, or with his full name, MARCUS VALERIUS MESSALLA CORVINUS, was born B.C. 59, in the same year as Livy. It would appear from a passage in Cicero's letters that he went to Athens in his fifteenth year to study. (Em. Att. xi. 321 B.) He was opposed to the life to the party of Antony and Octavius (Augustus), and was in consequence included in the proscription of the second triumvirate, a. d. 43 (Doni, xlvii. 11; App. Cez. iv. 39); but after the battle of Philippi, he contrived to make his escape to the conquerors, and was subsequently advanced by Augustus to offices of great trust and power. He accompanied Augustus in his campaign against Sextus Pompeius, B.C. 36, and on his return to Rome was made augur for the services he had rendered in that war. The military talents of Messalla appear to have been highly valued by Augustus; in B.C. 34, he subdued the Salassi and other warlike tribes which inhabited the Alps; and four years afterwards he conquered the Aquitanii, to which victor he was rewarded by the consulship in B.C. 31; iii. 1 (1). In the two following years he was sent by Augustus to Egypt and various parts of Asia on important public business; and on his return, B.C. 27, he obtained the honours of triumph on account of his conquest of Aquitania. He was chosen B.C. 25 for the quinquennial patrician office of bridge-keeper of Rome. B.C. 26. He died about a.d. 11.

Messalla was one of the most celebrated orators of his time; he is frequently mentioned by Quintilian in terms of the highest praise. (Inst. Orat. x. 1; compare Hor. Sat. i. 10. 29; Ars Poet. 370); and the author of the dialogue De Oratoribus considers him even superior to Cicero in grace and elegance of expression (c. 18). Messalla also appears to have paid attention to the study of language, and his grammatical usages have not only the advantages of the treatises on separate words, but even on separate letters. (Inst. Orat. i. 7; compare iv. 6.) He was a great patron of literature in general, and appears to have conferred no small benefits on Thukius, who frequently celebrates the praises of his patron with as much subervision as the other poets of the Augustan age.

M E S S E N E, [Messenia.]

M E S S E N E R S, KINGS, certain officers employed under a certain state, who kept in readiness, when occasion required, to carry despatches both at home and abroad. They are not now so often employed as formerly in serving the secretaries' warrants for the apprehension of persons for high-treason or other grave offences against the state. Formerly too it was the custom amongst them to keep themselves thus furnished at their own houses. A remarkable instance of this practice is detailed in the *Post-Boy* newspaper of 1713.

"London, Jan. 10, 1713. Yesterday morning the Morocco ambassador was taken into the custody of one of her majesty's messengers, by way of reprisal for his master's ordering and committing to slavery several of her majesty's subjects."

In the same paper, July 14, 1713, we read, "The emperor of Morocco having released those of her majesty's subjects that had been carried into slavery, Don Benurra de Zar, his ambassador, who was in custody of Mr. Chapman, the messenger, by way of reprisal, was on Saturday last set at liberty." And that his excellence must have passed six months in the emperor's custody."

MESSE'NIA (Messenia), a country of antient Greece, was bounded on the east by Laconia, on the north by Elis and Arcadia, and was surrounded by the sea on the western and southern side. It was a mountainous country, with a mountain-chain of Taygetus; and from Elis and Arcadia by the river Neda and the high land which runs between the bed of the Neda and the sources of the Pamias. [ARECADIA.] Its area is calculated by Mr. Clinton at 1163 square miles (Pritch Bull., ii. p. 392), which is about the area of Staffordshire.

Messenia is described by Pausanius as the most fertile province in Peloponnesus (v. 13, § 3); and Euripides, in a passage quoted by Strabo (viii. p. 368), speaks of it as a land well watered, very fertile, with beautiful pastures for cattle, and possessing a climate neither too cold in winter nor too hot in summer. The western part of Messenia is drained by the river Pamias, which rises in the mountains between Arcadia and Messenia, and joins the Hellespont (Gulf of Koroni). The basin of the Pamias is divided into two distinct parts, which are separated from each other on the east by some high land which stretches from Taygetus to the Pamias, and on the western side of the river a great plain called the Hydaspes, or Ithome. This plan, the plain of Stencyclus, is of small extent and moderate fertility; but the lower part south of Ithome is an extensive plain, celebrated in antient times for its great fertility; whence it was frequently called Macaria, or the 'blessed.' Leake describes it as being covered with the most delicious productions of the vine, the fig, and the mulberry, and 'as rich in cultivation as can well be imagined.' (Travels in the Morea, i. p. 329.) The western part of Messenia is diversified by hills and valleys, but contains no high mountains.

Messenia, in Homer Messene, is said by Pausanius to have derived its name from Messene, the wife of Polyceon, the first king of the country, who is described as the younger son of Lelex, king of Laconia (iv. 1, § 1). After the lapse of five generations, she is said to have passed into the hands of Perieres, the son of Helenus. At the time of the Trojan war Messenia appears to have been subject to Menelaus, with the exception of Pylius and probably part of the western coast, which was under the dominion of the Nelic princes of Pylus (vii. p. 359) to have obtained the whole of the country. On the division of the Peloponnesus, after the Doric conquest under the Heracleids, Messenia fell to the share of Cephrenes, who stationed himself at the Stencyclus, a frontier town, which they took, and put the inhabitants to the sword. This was the commencement of what is called the first Messenian war, the date of which is usually given, though it cannot be fixed with certainty, as a.d. 743. After the content of thirty years, during which they opposed Aristodemus distinguished himself by deeds of heroic valour, the Messenians were subdued and reduced to the condition of the Laconian helots. After bearing the yoke for thirty-nine years, the Messenians took up arms against their oppressors (c. 683), under the leadership of Aristomenes, a noble youth of the royal blood. (Arist. Polem. xii. 5.) The Messenians however were again subdued, a.d. 665; and those who remained in their native country were treated as slaves. The survivors of freedom however withdrew from Messenia, and a considerable body, under the two sons of Aristomenes, sailed to Italy, and settled at Rhegium. They afterwards obtained possession of Zanclo, on the opposite coast of Sicily, and called it...
M E S

Messianism, which has retained the same name (Messina) to the present day.

The Messenians again revolted in B.C. 464. This war, usually called the third Messenian war, lasted ten years; at the end of which time, the Messenians, who had occupied the strongly fortified mountain of Ithome, surrendered on condition of being allowed to retire from the Peloponnesus. The Athenians, who were not at that time good terms with Sparta, gladly allowed them to settle at Naupactus, a town at the entrance of the Corinthian gulf, which they had lately taken from the Laconians. (Thuc. iv. 24, § 2; Diod., xi. 70.) This place however the Messenians were obliged to quit, when, at the end of the Peloponnesian war, the Spartans became masters of Greece; but after the supremacy of Sparta had been overthrown by the battle of Leuctra, Epaminondas formed the design of restoring the independence of Messenia, and accordingly sent messengers to Italy, Sicily, and all parts of Greece, to invite the exiled Messenians to return to their native country. Numbers obeyed the summons, and in B.C. 363 a town was built at the foot of Ithome, which they called Messene. The independence of the Messenians was guaranteed by the peace concluded B.C. 361; and Messenia continued to remain an independent state till the dissolution of the Achaean confederacy. In B.C. 138, it became a part of the Achaean confederacy. It was an ancient and independent state, and the independence of its people was recognized by Pylos and Mothone, or Methone. The bay of Pylos (Navarino), which is protected from the swell of the sea by the island of Sphacteria (Sphagia), is the best harbour in the Peloponnesus. Pylos was the capital of the state, and according to Hymettus, and Pylos and Strabo, and must not be confounded with the fortress which was erected by the Athenians in the Peloponnesus at the northern entrance of the bay, on the spot called Coryphium by the Lacedaemonians. (Thucyd., iv. 103, 104; Strabo, vi. 2, § 7.) Pylos was built by Pylos, and according to the ancient national manners are said to have been retained, and the dialect remained, up to the time of Pausanias, the purest Doric that was spoken in the Peloponnesus (v. 27, § 2; Miller's Dorians, ii. 421, Eng. Trav. in G. and S.). Pylos, according to Pausanias (v. 35, § 1) to have been antiently called Peadus, a town mentioned by Homer: it appears to have been a place of some importance in the time of Pausanias. Passing the promontory Acrisias (Cape Gulo), we enter upon the Messenian Gulf; a present called Koroni; for a stadia north of Acrisias was Asine (Paus., iv. 34, § 7), originally inhabited by the Dryopes: following the coast, we come to Colonides, forty stadia north of Asine; and afterwards to Epea, which was called Corone after the restoration of the Messenians. At Epea was an ancient quay; and according to Pausanias, and Pherae, or Phare, which was annexed to Laconia by Augustus (Paus., iv. 30, § 2); and on the eastern coast of the gulf were Abia, which is mentioned by Homer, according to Pausanias (v. 30, § 1) to be full of balsam trees. Leuctrum or Leuctra, which belonged at one time to Laconia. (Strabo, p. 361; compare Tac., Ann., iv. 43.) It is difficult to determine the boundaries of Laconica and Messenia, as they differed at various times. Müller makes the river Neda, near Phara, the antient frontier line (Dorians, ii. 460); but in the time of Pausanias, the boundary was a woody hollow called Cherania, twenty stadia south of Abia (iv. 30, § 1). Strabo blames Eupirides for making the river Parnissus the boundary (p. 366); but perhaps Eupirides refers to the river of the same name, which Strabo himself tells us was in the vicinity of Leuctrum (p. 361).

The only town inland of any importance was Messene, situated, as already mentioned, at the foot of Mount Ithome, on the summit of which was the citadel. Strabo speaks of this town as the metropolis of Messenia, and the chief town in Peloponnesus (p. 361); and the account of Pausanias, who praises the strong fortifications of the town, is confirmed by the solid and beautiful masonry which remains to this day.

MESSIAH (מֶשֶּׁמֶא) is a Hebrew word, of the same significance as the Greek Μεσσηας (Christ) anointed. In the O.T. and the Targums it is repeatedly applied to persons who were consecrated to the service of God in some sacred office. Thus the Jewish priests, prophets, and kings are called מֶשֶּׁמֶא (Messiah), or the anointed of God. From this general meaning the word has passed into a particular use, referring to the illustrious personage whom the ancient Jews expected, and whom their descendants still expect, to confer some signal blessings on their nation and the world. The word is found in some sense twice in the Old Testament, in Psalm ii, 2, and in Daniel, ix. 25, 26.

The expectation of the Messiah, first excited by the promise given to Eve after the fall of man (Gen. iii, 15), may be traced from the exclamation of Eve at the birth of Cain, 'I have gotten a man from the Lord, a man Jehovah,' or 'a man Jehovah' (Gen. iv, 1), down through the patriarchal history, the Mosaic law, and the whole series of the Jewish prophecies; and it is very generally admitted that remnants of this early belief upon this subject are plainly seen in the religion and traditions of the Christians. For fuller information on these traditions, see Dr. J. P. Smith's Scriptural Testimony to the Messiah, book ii, c. 2; and Bp. Horsley's Dissertation on the Prophecies of the Messiah, annexed among the Hebræans.

The belief of the ancient Jews respecting the person and office of the Messiah is of course derived from the course of the Old Testament which are understood as predictions concerning him. An elaborate examination of all such passages occupies the 4th chapter of the 2nd book of Dr. Smith's Scriptural Testimony to the Messiah, and the following is his summary of the results of the inquiry (ibid., ch. v): 'From these words we have learned, that the Messiah was to be a real and proper human being (Gen. iii, 15; Dan. vii, 14); to be the long-promised prince and king (Gen. xiv, 19; Mic. vii, 14); to be a priest, teacher, and prophet, full in the midst of divine gifts and qualifications (Is. xlii, 2); the great and universal lawyer, who should be the author and promulgator of a new, holy, and happy government, founded upon the moral and natural evil (2 Sam. xxiii, 1-7; Job, xix, 23-27; Is. xli, 10; xlv, 21). The divine oracles have also informed us that, in the execution of these benevolent purposes, he should undergo the severest sufferings from the malice of the original tempter, the ingratitude and disobedience of men, and from the especial circumstance of his devoting himself a voluntary sacrifice to procure the highest benefits to those of mankind who should concur in his plan of mercy and holiness (Gen. iii, 15; Psalms, xcvi, 1; Is. liii, 5; Zech. vii, 9). We may add that from what we have learned of the Messiah, it is certain, that he should be should ye should be to his dearest interests, he should endure to glory, victory, and triumph; that he should possess power, authority, and dominion, terrible to his determined adversaries, and irresistible to all who love and believe him; that he should gradually extend those benefits to all nations; and that his beneficent reign should be holy and spiritual in its nature, and in its duration everlasting (Gen., xlix., 10; 2 Sam., xxiii, 1-7; Ps. ii, xiv, xlviii, xi, xix, 5; Dan., vii, 13, 14). The testimony of heaven likewise describes him as entitled to the appellation of Wonderful (Is. lix, 5); since he should be, in a sense peculiar to himself, the Son of God (Ps. ii, 7; Is. xlv, 6); as existing and acting during the patriarchal and the Jewish ages, and even before the creation of the whole world (Ps. ix, 7; Mic. v, 2); and the passages which relate to the Angel of Jehovah) as the all-sufficient guardian and protector of his people (Is. xi, 9-11, &c.); and the proper object of all the affections of piety, of devotional confidence for obtaining the most important blessings, and of religious and moral reverence (Is. xliii, 7; xvii, 11; 1, 21; Jer. vii, 25; Ps. xcvii, 7; Is. xlv, 21-25). That testimony, finally, declares him to be the eternal and immutable being (Ps. ciii, 25-28); the Creator (Ps. ciii, 20); the God, the Mighty God, Adoni (Is. xlv, 6); Jehovah of the just, and the Lord of all (Ps. i, 1). Jehovah (2 Sam. xxiii, 4; Is. vii, 5, viii, 9-15; xvi, 3, 10; xiv, 21-25; Zech., iii, iii, vii, viii, vii).' See also Hengstenberg's Christologie des Alten Testaments.

The expectation of the Messiah in the Jews in the period between the close of the Old Testament and the birth of Christ, as indicated by the Targums, the Apocrypha, the Book of Enoch, and the writings of Philo and Josephus, were confused and often inconsistent. Respecting the doctrines of the Targums on the Memra of Jah, or Word of God, and of Philo on the Logos, see Logos.
The Apocrypha the word Messiah or Christ never once occurs, and there are no passages which can be said with any certainty to refer to the Messiah, unless perhaps one in the Ecclesiasticus, ii. 10, 'I called upon the Lord, the Father of my Lord.' In the Book of Enoch, which was written by a Jew about a.C. 30, we have an account of a vision (evidently imitated from Daniel, vii. 9-14), in which the 'Son of Man' is associated with the 'Aiant of Days,' and is described as a person 'to whom righteousness begeth,' who 'will reveal all the treasures of that which is hidden,' who 'elected and whose name was called upon in the presence of the Lord of the Spirits before the world was created,' and who 'will be a suppliant to the righteous and holy' and 'the light of the nations,' before whom 'all who dwell upon the earth will fall down and worship,' who is to be a preserver and ruler, and superior to the kings of the earth. This 'Son of Man' will 'give glory to every person they have in the Lord of Spirits and his Messiah.' (Abb. Laurence's Book of Enoch, chaps. xlvii., xlviii., lxix.) From Josephus we learn nothing on the subject, a fact sufficiently accounted for by his own temporizing disposition and the circumstances in which he was placed.

At the time of Christ's advent various expectations respecting the Messiah prevailed among the Jews. It is sufficiently evident from the New Testament, that, while some looked for a human prince who was to deliver them from the Persian domination, and to confer on them only in expected a divine teacher who was to confer spiritual blessings not only upon them but also on the Gentiles. (Berthold's Christologia Judaorum Jesus Apostolorumque Aetaeis, and Kuinoel's Commentary in Lib. Hist. N. T. Prolectum, p. 136.) The opinion of the Jews has been expressed thus in John, iv. 42, that the Messiah would be a religious teacher and 'the Saviour of the world,' is worthy of special attention, because the Samaritans received no part of the Scriptures but the Pentateuch, and were cut off from all intercourse with the Jews by an intentional hatred. (Bishop Horsley's Sermons, xxiv.-xxvi.)

It is the belief of all Christians that Jesus Christ is the Messiah predicted in the Old Testament. The evidence of this is found recorded in the New Testament, especially in the four gospels, from which it appears that his lineage descended, the place, time, and other circumstances of his birth, the constitution of his person, the history of his life and death, the miracles he performed, and the doctrines he taught, all agree to the minutest particular with the prophecies respecting the Messiah. (Fuller's Jesus the true Messiah.)

The Jews, having rejected the claims of Jesus Christ, are still looking for the Messiah, whom they almost universally expect to be a warlike monarch, and to confer on them only temporal blessings. Most of the Rabbinical writers of the middle ages speak of two Messiahs: one, the son of David, the conquering monarch; the other, the suffering Messiah, the son of Joseph, who is to fall in battle, fighting for his countrymen against God and man, and the opinion seems to die for them. This opinion may be traced up to the sixth century, and perhaps higher. In these Rabbinical writings, especially in the book Zohar, there are scattered valuable fragments of the more ancient belief of the Jewish people on this subject. (Schottengrui, Horae Hebraicas et Talmudicas; and Lightfoot's Works.)

In different ages there have appeared numerous false Messiahs (Matt. xxiv. 24). Of these ecclesiastical historians are generally silent, for the reader is referred to Johannes à Lenti's History of False Messiahs.

MESSINA, INTENDENZA, or Province of, comprises the north-eastern extremity of Sicily, and is bounded on the west by the province of Palermo, on the south by that of Catania, on the north by the Mediterranean, and on the east by the Faro or Straits of Messina, which divide it from Calabria. The greatest length of the province is 60 miles, and its breadth 30 miles. A continuation of the mountainous ridge which runs across Sicily from west to east, known to the ancients under the various names of Nebrodes, Heresi, Pelorins, &c., covers the greater part of the interior of the province, and terminates at Cape Pelorus. A number of towns, called during the rainy season descend from both sides of the ridge, but they are nearly dry in summer. On the south-west the province of Messina skirts the base of Mt. Etna, the mass of which belongs to the province of Catania. The province of Messina has no great pains, but it contains many valleys. Its chief products are wine, oil, and fruit of every sort. The towns of the province are 1. Messina. 2. Melazzio, the ancient Mylae, a seaport town on a promontory of the southern coast facing the Lipari islands, fifteen miles west of Messina, with a castle and 7000 inhabitants, many of whom are employed as sailors and fishermen. It exports much wine from the Carthaginian ports, and not far from the ruins of the ancient Tyndaris, has several churches and also oil. The red vine, which is made nearer to Messina, is better than that of the district of Melazzio. 3. Patti, on the same coast, fifteen miles south-west of Melazzio, and not far from the ruins of the ancient Tyndaris, has several churches and also oil. The red vine, which is made nearer to Messina, is better than that of the district of Melazzio. 4. Taormine, the ancient Taurorenium, on the east coast of the island, and at the north-east base of the group of Etna, an old looking town with about 4000 inhabitants, is built upon a steep cliff of volcanic rocks, and has a beautiful view of the sea. The red vine, which is made nearer to Messina, is better than that of the district of Melazzio. 5. Castro Reale, in a valley rich in oil and wine, has 12,000 inhabitants. 6. Randazzo, at the north base of Etna, in a very fertile district, has 15,000 inhabitants.

The islands of Lipari are included in the administrative province of Messina. [LIPARI ISLANDS.]

MESSINA, the Town of, lies on the north-east coast of Sicily opposite the Calabrian coast, from which it is separated by the channel of the Faro, which is here about four miles wide. It is in fact a small town, about four miles from the promontory of Faro Point, or Cape Pelorus. The town of Messina is built partly on the slope of a steep hill, and partly along the sea-shore at the foot of it. The port of Messina is formed by a strip of sandy beach projecting into the sea at two narrow distants, which shelter the entrance of the port. The town of Messina is composed of four quarters: the north, west, and south are inhabited by foreigners, and the east is inhabited by Greeks and Italians. The climate of Messina is very temperate, the summer is hot and dry, and the winter temperate. The climate of Messina is not so salubrious as that of Palermo or Catania.

Messina has many remarkable buildings: the cathedral, the town-hall, the university, and the port, are all of considerable interest. The University was founded in 1421 by Robert of Anjou, the Duke of Calabria, and contains some fine paintings. The church of Santa Maria de Grazie belongs to the Greek clergy, whose protopapa is the spiritual head of the Greek or Epirote colonies settled in Sicily. The royal palace, the archbishopial palace, that of the senese, the seminary, the great hospital, the arsenal, the loggia and exchange, the granaries, the royal college, the bank, and the two theatres, are all worthy of notice. The public library, founded by Constantine Lascaris, is rich in Greek MSS. Messina is an archbishopric and a suffragan of the see of Catania, and a cardinal-honor for the province, a commercial tribunal, a royal college, called Academia Carolina, for the study of law and medicine, and about 60,000 inhabitants. (Serristii, Saggio Statistico: Nuova Guida dei Viaggiatori in Italia, Milan, 1838.)

The name was also written 'Dehachi,' as appears by the coin which accompanies this article.
lamb-skins and kid-skins, liqueur, and other produce of the island. The spinning and weaving of silk form the principal manufacture, and employ several thousand hands.

(Saggio sui mezzi di moltiplicare le Richeze della Sicilia, by G. de Wels, 4to., Paris, 1822.) For the history of Messina see Hieron II., and Sicily.

Metacentre is a point in a floating body, the position of which, relative to that of the centre of gravity, determines the force for the stability or instability of the equilibrium of that body. The equilibrium is stable, if, when the body receives a slight disturbance from its position, it tends, by the combined action of its own weight and the pressure of the fluid in which it is partially immersed, to re-adjust itself to that position after some oscillations; and the equilibrium is unstable if a slight disturbance will cause the body to overset and acquire a different position, which will then necessarily be one of stable equilibrium.

The surface of a heavy fluid at rest is a horizontal plane; the portion of this plane which we may imagine to be within the floating body is called the plane of flotation.

When a body floating on a fluid is in equilibrium, the weight of the body applied downwards at its centre of gravity must be equal and opposed to the pressure of the fluid, which is the same, to a force equal to the weight of the displaced fluid, applied upwards at the centre of gravity of this portion of the fluid; hence in this position the right line joining these two centres is vertical, and is called the line of support.

When the body is slightly disturbed from this position, the plane of flotation evidently alters its position in the floating body; the centre of gravity of the part immersed also changes, and the thrust of the fluid will in general no longer pass through the centre of gravity of the body. The magnitude of this force will however undergo but a very small change, and the body is now subjected to the action of two forces which are equal and contrary, but no longer directed opposite.

The figure and density of a body may however possibly be such that the thrust of the fluid may, after the disturbance, continue to pass through the centre of gravity of the body. The equilibrium is then said to be indifferent, inasmuch as the disturbance communicated only produces a new position of equilibrium. This happens when a body floats in a fluid of equal density with itself, and in other cases, as in a floating sphere. We may observe that if the disturbance of the equilibrium consisted merely of an elevation or depression of the centre of gravity, equal vertical oscillations of itself would be the consequence: the disturbance considered here is supposed such as to tend to turn the body round its centre of gravity, or to make the original line of support deviate in a vertical plane through a very small angle; this line is called the axis passing through the centre of gravity.

When the position of the body is thus disturbed, if the line of thrust when produced upwards meets the above-named axis, the point of intersection is called the metacentre. The consequence motion of the body will then be the same as if the centre of gravity were fixed, and the thrust applied vertically at the metacentre; hence if the metacentre be above the centre of gravity, the thrust tends to re-adjust the axis, and the equilibrium is stable; if below, that force tends to carry the axis farther from its original place, and the equilibrium is instable: if the two centres coincide, the equilibrium is indifferent. We give an example:

![Fig. 1.](image)

Fig. 1. A B C D is a vertical square section passing through G, the centre of gravity of a rectangular beam floating on a fluid of twice its specific gravity, this section being at right angles to the faces of the beam; therefore

\[ \text{Mathematics equation here.} \]

G H = \frac{1}{4} A B; and if \( g G \) = \( \frac{1}{4} A B, g \) is the centre of gravity of the fluid displaced, \( G G \) is the line of support, and \( E F \) the plane of flotation.

**Fig. 2.**

Fig. 2 represents the same body turned round its centre of gravity through a small angle \( FG \) or \( \theta \). Let \( G F = 1 \); we must find \( g \), the centre of gravity of \( e c b \), and draw \( g ' O \) vertical or perpendicular to \( e c \), cutting the axis \( G H \) at \( O \). The metacentre be \( m n \), be the centre of gravity of the portions \( E G \), \( F G \), and \( A \) that of the portion \( F C B \), then \( h g : g m = \text{solid } E G : \text{solid } e c b \); and \( h g : g ' = \text{solid } F G : \text{solid } F G C B \); but the solids \( E G \), \( F G \), are equal: hence \( h g : g m = h g : g ' \), therefore \( g g \) is parallel to \( m n \), or nearly horizontal, and \( = m n \), solid \( F G C B \) nearly. Now \( m n = 2 G m = 4 \); and solid \( E G \) is \( \frac{1}{8} \times 4 \times 8 = 2 \times \); solid \( F G C B = 2 \times \); therefore \( g g = \frac{4}{3} \times 4 \times 8 = \frac{64}{3} \); hence the equilibrium is instable. If the equilibrium were stable, the times of the oscillations would be found by supposing the thrust applied at \( O \), the point \( G \) remaining fixed.

**METAGALLIC ACID** is prepared by the partial decomposition of gallic acid by quicksilver or heating it up to about 490°C. Carbonic acid and water are formed and separated, and a black, shining, tasteless compound is left, which is not dissolved by water, but is easily taken up by the alkalies ammonia, potash, and soda in solution. It also decomposes the solutions of the alkaline carbonates, expelling the carbonic acid. Metallagallate of potash gives insoluble precipitates with the salts of barytes and strontium, and also with many metallic salts.

It is composed of:
- Three equivalents of hydrogen
- Twelve equivalents of carbon
- Three equivalents of oxygen

**Equivalent**

**METALLURGY** is the art of separating metals from their ores. The processes vary for every metal, and are described under each.

**METALS**. The metals form a numerous and highly important class of simple or elementary bodies. Different opinions are entertained as to their number, which arises from the circumstance that a few substances are regarded as metallic in their nature by some chemists, while by others their claim to this title is either doubted or denied; thus by Berzelius a substance which he discovered and called selenium is regarded as a metal, but it is not so ranked by any English chemist; again, the base of silice is by some classed as a metal, and by them termed meteorium; whereas many consider it as more nearly allied in nature to borax, and call it silicium.

We shall consider neither of these bodies as metals. Independently of them, the metals, including those which have been longest known, as well as some whose claims are even yet somewhat doubtful, amount to forty-two; they are, given alphabetically, as follows:—aluminium, antimony, arsenic, baryum, bismuth, cadmium, calcium, cerium, chro- nium, cobalt, columbium, copper, guncium, gold, iridium, iron, iotanium, lead, lithium, magnesium, manganese, mercury, molybdian, nickel, osmium, palladium, platinum, potassium, zirconium, silver, sodium, stronium, tellurium, Vol. XV.-B
The ductility and malleability of metals are in general considerably increased by heat, but only to a certain extent. There are some metals which are malleable only between two very near degrees of temperature: such, for example, is the case with zinc.

The degree of tensility of metals is indicated by the powers of the wires in supporting a given weight. The following weights are capable of being sustained by wires of the annexed metals about 8'400 of a line in diameter:

<table>
<thead>
<tr>
<th>Metal</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron</td>
<td>549-250</td>
</tr>
<tr>
<td>Copper</td>
<td>302-278</td>
</tr>
<tr>
<td>Platina</td>
<td>274-920</td>
</tr>
<tr>
<td>Silver</td>
<td>187-137</td>
</tr>
<tr>
<td>Gold</td>
<td>150-733</td>
</tr>
<tr>
<td>Zinc</td>
<td>109-540</td>
</tr>
<tr>
<td>Tin</td>
<td>34-630</td>
</tr>
<tr>
<td>Lead</td>
<td>67-321</td>
</tr>
</tbody>
</table>

There are only a few metals which are very hard when they are pure. The following table exhibits some of them arranged according to the degree in which they possess this property, according to Professor Brande:

<table>
<thead>
<tr>
<th>Metal</th>
<th>Hardness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium</td>
<td>Silver</td>
</tr>
<tr>
<td>Rhodium</td>
<td>Bismuth</td>
</tr>
<tr>
<td>Tellurium</td>
<td>Gold</td>
</tr>
<tr>
<td>Palladiun</td>
<td>Zinc</td>
</tr>
<tr>
<td>Manganese</td>
<td>Antimony</td>
</tr>
<tr>
<td>Iron</td>
<td>Cobalt</td>
</tr>
<tr>
<td>Nickel</td>
<td>Tin</td>
</tr>
<tr>
<td>Antimony</td>
<td>Arsenic</td>
</tr>
<tr>
<td>Copper</td>
<td>Lead</td>
</tr>
</tbody>
</table>

M. Dumas however arranges the metals somewhat differently: he begins with manganese as the hardest, which certainly is not the case; for titanium, which he does not mention at all, should precede that and every other metal. M. Dumas's statement is as follows:

Manganese: Harder than tempered steel.
Chromium: Not scratched by glass.

The elasticity and sonoroucity of metals are generally associated with their degree of hardness. There are not however any metals which are by themselves either very elastic or sonorous; but there are alloys which possess these properties in a high degree, as for example those of copper and tin.

The structure of metals is sometimes lamellar, sometimes granular, and frequently crystalline: indeed, some of them, and more especially copper, occur crystallized in the form of the cube and its varieties. Bismuth is a metal which may be artificially crystallized in cubes with great facility.

As to the action of the imponderables upon the metals, it must be premised that no particular effect has been attributed to the agency of light.

The metals are good conductors of heat; they differ however greatly in the celerity with which it pervades them. According to M. Desprez, assuming the conducting power of gold as a standard, that of the undermentioned metals is as follows:

<table>
<thead>
<tr>
<th>Metal</th>
<th>Conducting Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold</td>
<td>10,000</td>
</tr>
<tr>
<td>Silver</td>
<td>7,730</td>
</tr>
<tr>
<td>Platina</td>
<td>5,810</td>
</tr>
<tr>
<td>Copper</td>
<td>5,592</td>
</tr>
</tbody>
</table>

Capacity for Heat—M. Petit and Dulong have deter-
Volatility.—Metals also differ in this respect. Some metals are volatilized at moderate degrees of heat; among these are mercury, cadmium, arsenic, tellurium, zinc, potassic, and sodium; but there are others which may be exposed to the most intense heat of a wind furnace without being at all volatilized.

Electricity.—Beccarol has given the following table of the relative conducting powers of the metals for electricity, the wires of the several metals being of equal diameter:

- Copper 100
- Gold 93.6
- Silver 73.0
- Tin 29.50
- Platinum 16.40

According to Pouillet, each of the following metals is positive with relation to that which follows it:—zinc, lead, tin, iron, antimony, bismuth, copper, mercury, silver, gold, tellurium, palladium, platinum.

Magnetism.—There are two metals only which are capable of being rendered permanently magnetic, namely, iron and nickel; the former of these only is met with possessing this property in nature; it is an oxide of iron, and commonly called the lodestone. Most of the metals combine with each other and form compounds differing very materially in properties from their constituent metals. [Alloys.]

Oxygen and Metals.—All metals unite with oxygen, but with different degrees of facility and affinity; most of them combine with more than one proportion of oxygen and some of them with several proportions. The nature of the compounds formed is extremely various; thus some metals form with oxygen comparatively inert compounds or mere oxides, such as iron and zinc; others, such as potassium and sodium, when oxidized become alkailes; while arsenic and chromium form acids with this element. It has been already observed that some metals unite with several proportions of oxygen, and these may be mere oxides, as in the case of iron; or oxides and acids, as copper and manganese; but there is no case of any metal forming a mere oxide and an alkali with different proportions of oxygen, or an acid and an alkali under the same circumstances.

Acids and Metals.—No permanent compound of these is known.

Hydrogen and Metals do not readily combine; there are only two remarkable compounds; these result from the union of hydrogen with arsenic and with tellurium.

Chlorine and Metals combine with great facility, and the compounds are extremely important; every metal is indeed susceptible of this combination; chlorine possesses the remarkable property of forming in general volatile compounds with the metals.

Bromine, such as chlorine, and phosphorus combine with most of the metals: for an account of their properties, as well as those which the metals form with the preceding elements, see each particular metal. The action of the air, of water, and of the acids, upon the metals, is extremely various, and depends greatly upon their respective affinities for oxygen; few of them are oxidized in dry air, but many of them tarnish and some oxidize readily in it when moist, of which iron is an example. Some metals, as potassium, sodium, and manganese, decompose water even at common temperatures, combining with its oxygen and evolving the hydrogen; others, as iron and zinc, require to be strongly heated, or the presence of an acid, to effect this decomposition.

Although most metals are dissolved by acids, yet platin and gold are exceptions to this, and some others requiring chlorine, and generally in the nascent state called aqua regia. Few metals however are acted upon by acids without the presence of water, and in some instances the water, in others the acid, and often both, suffer decomposition, and it is to be observed that no metal dissolved in acid unless it be either previously oxidized or acquire oxygen from the mixture of acid or water in which the solution takes place: the salts formed are in many cases of the highest importance in chemical investigations, in the chemical arts, and in medicine.

METAMORPHOSIS OF ORGANS, in the Vegetable Kingdom, consists in an adaptation of one and the same organ to several different purposes; connected with which are changes in form, structure, colour, and other particulars. The plan upon which the development of plants takes place, notwithstanding the infinite variety observable in the vegetable kingdom, is extremely simple, and is executed by
modifications of one kind of elementary tissue, and one kind of external organ. In the beginning, that is to say, in its embryonic state, a plant is only a mass of spheroidal cellular tissue possessing vitality. But as soon as it is excited into growth, some of the cells lengthen and become woody tissue; others lengthen and generate an elastic spiral thread in their inside, acquiring the form and property of spiral vessels, while numerous other changes of a similar nature are produced; to each of which branches and petals are added. But a common fact is, the conveyance of fluids in particular directions, the conveyance of air, the strengthening of certain parts, the defence of others, and so on. In like manner a plant in the beginning consists of nothing but an axis of growth, two spiral vascular tissues developed in certain cells of the axis; to give it lungs and a stomach, without which it could not live, points upon its surface are expanded into leaves; these organs at particular parts of the system alter their texture, colour, and form, and become floral envelopes, or they contract, and organise in their interior a substance called pollen, when they become male organs, or, finally, they roll up, and convert themselves into hollow bodies, within which are generated ovules or young seeds. These circumstances rightly understood, are found to afford the clearest explanation of the plan upon which the mode of vegetable organisation is produced, and especially of those anomalous or monstrous cases whose occurrence is so common and difficult of explanation in the absence of the light thrown upon them by Morphology, or the theory of vegetation, as is found by us.

This subject originated in the second volume of the tenth edition of the Systema Naturae, published in 1759, in which Linnaeus thus expresses himself:—Leaves are the creation of parts of the hypocotyl; the petals of the fourth, stamens of the fifth, and the stamens are succeeded by the pistil. This is apparent from Ornithogalum, luxuriant and prolific plants, double flowers, and Carduus.

In December, 1768, these propositions were sustained by Linnaeus in a thesis called the 'Prolepsis Plantarum.' He commences by remarking that as soon as leaves have expanded themselves in spring, a bud is observable in the axil of each. This bud swells as the year advances, and in time becomes prolonged, in the axil of which the leaves fall off, but the bud remains, and in the succeeding spring swells, disengages itself from its envelopes, and becomes lengthened: when its outer scales have dried up and fallen off, the inner ones are expanded into leaves, which are separated by a gradual extension of the young branch, and presently each new leaf is found to contain in its bosom a little scaly bud, which in the following season will also be developed as a branch, with other leaves and other buds. Now in flowering plants, the trees add all the leaves, and of the bosom of these leaves provided with its little-buds, we naturally inquire,—of what do these buds consist? Can it be of rudimentary leaves, each with its budlets, the latter of other leaves and buds, and so on to infinity, or at least as far as the extension of the plant is likely to proceed? Nature organises living beings out of such minute particles, and even from fluids themselves, that the best eye may in vain seek to penetrate far into her mysteries. I shall however endeavour to show that the composition of buds does not extend further at one time than provision for seven years; just as, among animals, we find the little Volex globator containing within the mother its children, grand-children, great-grand-children, and great-great-grand-children, and great-great-great-grand-children, and so on.

The defects of this theory consisted, firstly, in its not accounting for the modifications of the pistil; and, secondly, in the fanciful supposition that the organs of fructification are prepared six years beforehand, and that their peculiar appearance is owing to the time of this development being anticipated by some unknown but ever-acting cause. It was this which probably caused the whole theory to be generally neglected. It was however maintained by Ludwig and Pufendorf, though of whom in their work much upon the speculation of Linnaeus, by rejecting what was fanciful and supplying to a certain extent an explanation of the origin of the pistil, that his paper in the Novi Commentarii Academiae Petropolitanae for 1768 would undeniably prove to be correct. It was afterwards a new era in botanical philosophy if it had been known to botanists. But as it was introduced into a paper upon the formation of the intestines of animals, it does not appear ever to have attracted attention until it was discovered by Miquel a few years ago.

It is in reality to the celebrated poet Goehe that the honour justly belongs of having brought before the world the close and philosophical manner the doctrine of all the parts of a plant being reducible to the axis and its appendages, and consequently of having proved, to use his own words, that vegetables 'develop themselves out of the little seed within a chemical manufactory by the discovery of the real laws of structure, and of the analogies which exist between one thing and another in different tribes of plants; thus laying the foundation of vegetable comparative anatomy by establishing a principle in harmony with all the laws obeyed by millions of isolated facts.'

A perfect plant consists of branches successively produced out of each other from one common stock, and each furnished with exactly the same organs or appendages as its predecessor. When the fructification is produced, an activation takes place in the extremity of the fructifying branch, which is incapable, generally speaking, of further prolongation; but as the branches, before they bore fruit, were repetitions the one of the other, so are the branches bearing fruit repetitions of each other. In each of these branches, a thousand fertile branches from the same tree are compared together, they will be found to be formed upon the same uniform plan, and to accord in every essential particular. This to be thus held, in the hands of the circumstances, capable of itself becoming a separate individual in all its parts, in all its constitutions, budding, grafting, and other horticultural processes. This being the case, it follows that what is proved of one branch is true of all other branches.

It is also known that the elementary organs used by nature in the construction of vegetables are essentially the same; that the plan upon which these organs are combined, however various their modifications, is also uniform; that the fluids all move, the secretions all take place, the functions are all carried on upon the same mode; and all the variations we see in the vegetable world are governed by a few simple laws, which, however obscurely they may be understood by us, evidently take effect with the most perfect and uniformity.

Hence it is not only true that what can be demonstrated of one branch is true of all other branches of a particular individual, but also that whatever can be shown to be the particular principles that govern the structure of one individual, will also be true of all other individuals. It is particularly requisite that this should be clearly understood, in order that a just estimate may be formed of the nature of the proofs to be adduced with respect to the doctrines of morphology. Whatever can be demonstrated to be true with regard to one branch is equally true of all branches, and if it is proved with reference to one organ is proved by implication as to the same organ in all other individuals whatsoever.

Moreover, the fact of one organ being readily transformed into another organ is in itself a strong presumption of the identity of their origin and nature; for it does not happen that one part assumes the appearance and functions of another, if they are originally different. Thus, while the functions of the hand may be performed by the feet, as we know they occasionally are in animals, nothing leads the heart to perform the function or assume the appearance of the liver, or the liver of any other organ. This is one of the arguments of Linnaeus.

The organs which are formed by a modification of leaves are the bracts; these bodies are intermediate between the leaves and the calyx. Their nature is extremely various; sometimes they have a greater resemblance to the leaves, and sometimes to the calyx. In some roses, as R. canina, as previously distilled, the bracts of which now and then is attached; in other species, as R. spinosissima, they differ in no respect from the other leaves. In the tulip a bract is occasionally present upon the scape, a bract so large as to be comparable to that of a tree, bearing always a name of nature particular to both of the leaf and the flower. In other flowers the purple scale-like bracts often become gradually narrower, and acquire a green colour like leaves. It has been stated by some botanists, that bracts are distinguishable from leaves by the presence of a leaf-base, but this, in reality, is an indication of such a distinction is apparent from a variety of cases. In Polygonum viviparum, and all viviparous plants, the flowers themselves are converted into buds within the
bracts. There is a bud in the axil of every bract of the rose. The common daisy often bears buds in the axil of the bracts of its involucre; in which state it is commonly known in gardens by the name of 'hen and chickens.' In the rose, a cluster of branches covered with minute imbricated colored leaves resembling bracts is produced in lieu of each flower. Here all the parts of the fructification, instead of remaining at rest to perform their functions, are attempting, but in vain, to attract the attention of the insect. It is not to be assumed that state from which, for the purpose of perpetuating the species, they had been metamorphosed by nature. Hence it is clear that bracts cannot be essentially distinguished from leaves.

With the leaves the stem of the flower properly so named; it forms what some morphologists call the outer whorl of the fructification, and with it commences a new order of leaves, namely, those of the fructification, said to be distinguished from the leaves of vegetation by their constantly vertical arrangement, and by the want of buds in their axis. With the leaves of the fructification all power of further increase ceases; the energies of the plant being diverted from increasing the individual to multiplying the species. The general rule, however, the corolla and calyx of the vegetation is well known: its green colour, and tendency to develop itself into as many leaves as it consists of divisions, especially in double roses, is so notorious that it need not be insisted on. In the case of Mesembryanthemum barbatus, it is the third whorl of the leaves between the leaves of the calyx and those of the stem. The resemblance however between the calyx and the stem-leaves is often not apparent; but the identity of the calyx and bracts is usually more obvious. In Cereus the tendency to increase by the one is the same as by the other. In some of the species of Calthia palustris was separated from the rest, and furnished with a bud. And Du Petit Thouars speaks of a specimen of Brassica napus on which branches were produced within the calyx. A monster of Herrera parviflora has been seen of the same nature. (Lindley, Introduction to Botany, ed. 2, p. 523.) From this it is apparent that the divisions of the calyx are not only not distinguishable from bracts, but that there is often a strong tendency in the former to assume the ordinary appearance of leaves. There is, however, a difference, by the frequent presence of nectaries in order to complete the proof of the identity of calyx and leaves; this is, the verticillate arrangement of the former. Leaves are either opposite, alternate, or whorled; and these differences are made out by the cup; and as such differences in the cup; and as such differences are not considered as wanting the lower row of stamens, and developing the second row instead. Thus in Primulaceae, in which the stamens are opposite to the petals, and therefore belonging to a second whorl, the petals are in Schlegel's case in the form of clavate or subulate processes arising from the sinuses of the limb. These and similar processes, which are far from uncommon in plants, and which are known by various names, such as scales of the orifice of the corolla, glands, nectary, cup, &c., are in most cases metamorphosed stamens. In Narcissus the cup is formed of three stamens of the first row, become petaloid and united at their margins; while the six which form the second and third rows are in their usual state and within the tube. This is shown, says Schleiden, by the position of the connation, which then alternate with the petals; secondly, by a distinct tendency in double Narcissi, particularly N. poetica, to produce abortive anthers on the margin of the lobes for the general proliferation of the plant. In that genus the crown of the original species consists of three petaloid pieces, not united into a cup, as in Narcissus, but wholly separate from each other: in Leucojum vernum these pieces are not petaloid, but clavate; and in Leucojum odorum the species have the same figure as in L. vernum, but almost constantly bear more or less perfect anthers. That the anthers are mere alterations of the petals of stamens, there is no difficulty in demonstrating. In Vilmorin the passage from the one to the other may be distinctly traced. In double roses the precise nature of this metamorphosis is shown in a very instructive way. If any double rose is examined, it will be seen that those petals which are next the stamens contract their claw into the stem of the flower, the petaloid anther is in the same way distinguished there. Not so in the stamens of the limb, also takes place; the two sides become membranous, and put on the colour and texture of the anther; and sometimes the perfect lobe of an anther will be found on one side of a petal, and the half-formed, miniaturized, opposite side. In Aquilegia vulgaris this transformation is still more curious, but equally distinct: the petals of that plant consist of a long sessile purple horn or bag, with a spreading margin; while the stamens consist of a slender and dilated agglutinated into a stem, around which the white leaves of the calyx are alternately imbricated; and in double tulips the outer whorl, representing the calyx, frequently loses its verticillate arrangement, and becomes imbricated like the leaves of a stem. The same structure also occurs in the double white Fritillaria meleagris. Hence it cannot be doubted that the calyx consists of stamens in a particular form.

The corolla forms the second line or whorl of the fructification. It consists of several divisions, usually not green, and always alternate with those of the calyx. It is a series of various shapes arising with a tendency to a whorl, but not nearly to assume that state from which, for the purpose of perpetuating the species, they have been metamorphosed by nature. Hence it is clear that bracts cannot be essentially distinguished from leaves.

With the corolla the stem properly so named; it forms what some morphologists call the outer whorl of the fructification, and with it commences a new order of leaves, namely, those of the fructification, said to be distinguished from the leaves of vegetation by their constantly vertical arrangement, and by the want of buds in their axis. With the leaves of the fructification all power of further increase ceases; the energies of the plant being diverted from increasing the individual to multiplying the species. The general rule, however, the corolla and calyx of the vegetation is well known: its green colour, and tendency to develop itself into as many leaves as it consists of divisions, especially in double roses, is so notorious that it need not be insisted on. In the case of Mesembryanthemum barbatus, it is the third whorl of the leaves between the leaves of the calyx and those of the stem. The resemblance however between the calyx and the stem-leaves is often not apparent; but the identity of the calyx and bracts is usually more obvious. In Cereus the tendency to increase by the one is the same as by the other. In some of the species of Calthia palustris was separated from the rest, and furnished with a bud. And Du Petit Thouars speaks of a specimen of Brassica napus on which branches were produced within the calyx. A monster of Herrera parviflora has been seen of the same nature. (Lindley, Introduction to Botany, ed. 2, p. 523.) From this it is apparent that the divisions of the calyx are not only not distinguishable from bracts, but that there is often a strong tendency in the former to assume the ordinary appearance of leaves. There is, however, a difference, by the frequent presence of nectaries in order to complete the proof of the identity of calyx and leaves; this is, the verticillate arrangement of the former. Leaves are either opposite, alternate, or whorled; and these differences are made out by the cup; and as such differences in the cup; and as such differences are not considered as wanting the lower row of stamens, and developing the second row instead. Thus in Primulaceae, in which the stamens are opposite to the petals, and therefore belonging to a second whorl, the petals are in Schlegel's case in the form of clavate or subulate processes arising from the sinuses of the limb. These and similar processes, which are far from uncommon in plants, and which are known by various names, such as scales of the orifice of the corolla, glands, nectary, cup, &c., are in most cases metamorphosed stamens. In Narcissus the cup is formed of three stamens of the first row, become petaloid and united at their margins; while the six which form the second and third rows are in their usual state and within the tube. This is shown, says Schleiden, by the position of the connation, which then alternate with the petals; secondly, by a distinct tendency in double Narcissi, particularly N. poetica, to produce abortive anthers on the margin of the lobes for the general proliferation of the plant. In that genus the crown of the original species consists of three petaloid pieces, not united into a cup, as in Narcissus, but wholly separate from each other: in Leucojum vernum these pieces are not petaloid, but clavate; and in Leucojum odorum the species have the same figure as in L. vernum, but almost constantly bear more or less perfect anthers. That the anthers are mere alterations of the petals of stamens, there is no difficulty in demonstrating. In Vilmorin the passage from the one to the other may be distinctly traced. In double roses the precise nature of this metamorphosis is shown in a very instructive way. If any double rose is examined, it will be seen that those petals which are next the stamens contract their claw into the stem of the flower, the petaloid anther is in the same way distinguished there. Not so in the stamens of the limb, also takes place; the two sides become membranous, and put on the colour and texture of the anther; and sometimes the perfect lobe of an anther will be found on one side of a petal, and the half-formed, miniaturized, opposite side. In Aquilegia vulgaris this transformation is still more curious, but equally distinct: the petals of that plant consist of a long sessile purple horn or bag, with a spreading margin; while the stamens consist of a slender and dilated agglutinated into a stem, around which the white leaves of the calyx are alternately imbricated; and in double tulips the outer whorl, representing the calyx, frequently loses its verticillate arrangement, and becomes imbricated like the leaves of a stem. The same structure also occurs in the double white Fritillaria meleagris. Hence it cannot be doubted that the calyx consists of stamens in a particular form.

The corolla forms the second line or whorl of the fructification. It consists of several divisions, usually not green, and always alternate with those of the calyx. It is a series of various shapes arising with a tendency to a whorl, but not nearly to assume that state from which, for the purpose of perpetuating the species, they have been metamorphosed by nature. Hence it is clear that bracts cannot be essentially distinguished from leaves.
The place, and the horn, diminished in size, no longer proceeds from the base, as in the genuine petal, but from the apex of the new form unguis. In this last transition, the lobes of the anther are more fully formed, and the horn is almost contracted within the dimensions of the connective, retaining however its purple colour: the next stage is the perfect stamen. The conversion of stamens into green leaves occur in Plantago and Sisymbrium. These taurine permanent instances are known of a conversion of the stamens, with all the other floral organs, into leaves. Thus it appears that the stamens, like the petals, calyx, and bract, are merely modified leaves.

The disk is so frequently absent, and is of so obscure nature, that few morphologists take it into their consideration. In many plants it consists of a mere annular fleshy ring encompassing the base of the ovary; in others it forms a sort of cup, in which the ovaries are enclosed, as in certain Paeonies, and it very frequently makes its appearance in the form of hypogynous glands or scales; it is almost always between the stamens and pistil. That it is not an organ of a distinct nature may be inferred from its having no more number of flowers than the stamens: but if it is not an organ of itself, it must be a modification of something else, and in that view, from its situation, it would be referrible either to the stamens or pistil. It has so little connection with the latter, from which it always separates at maturity, that it cannot be considered as belonging to it. With regard to the stamens it is not without a stronger relation: it consists of the same cellular substance as the connective of the anthers, is very often of the same colour; whenever it separates into what are called hypogynous glands or scales, these always alternate with the innermost series of stamens, and the Paeonie disk may in some measure be compared to the inner row of scales which exist between the stamens and pistil of the nearly-related genus Aquilegia. Dunal has noticed half the leaves of bearing stamens in a variety of plants may be added of an insensible gradation from the stamens to the most rudimentary state of the organ.

The fifth and last series of the fructification is the pistil. The simple pistil, that of the pea for instance, consists of an ovary, bearing its ovules on one side in two parallel contiguous rows, and at its upper extremity tapering into a style, which terminates in a stigma. If this organ be further examined, it will be found that there is a surtute running down each side of the style to the base, so that the ovules are attached to one of these surtutes, and that the style is an elongation of the other: further, it will be perceived that the two sides of the ovary are traversed by veins emanating from the surtute that terminates in the style. These veins take a rather direct and ascending direction towards the surtute which bears the ovules. Now if, when the pod of the pea is half grown, it be laid open through the latter surtute, all these circumstances will at that time be distinctly visible; and if it then be compared with one of the loblets of the plant, it will be apparent that the surtute that bears ovules answers to the two edges of the leaf, the surtute without ovules to the midrib, and the style to the nuero. Hence it might, without further evidence, be suspected that the ovary is an alteration of the leaf; but if the inquiry be carried further in other plants, this suspicion becomes converted into certainty. In the first place, the surtute without ovules, which has been said to be the midrib, is always external with respect to the axis of fructification, as would be the case with the midrib of a leaf folded up and terminating the fructification. In the next place, nothing is more common than to find the pistil converted either into petals or into leaves. Its change into petals is, I think, to be found in numerous double flowers, as for example double roses, double peonies, flowers, ranunculuses, saxifrages, and others. These however only shew its tendency to revert to petals as the representatives of leaves. The cases of its reverting to other organs is much less frequent. In Eupeorus the ovary is extremely like one of the segments of the calyx; its ovoliferous sature is not closed; in the room of ovaries it sometimes bears little yellow processes like minute petals, and its back corresponds to what would be the back of the calyx; no style or stigma is visible; sometimes two of these metamorphosed ovaries are present; in that case the surtutes which should be oppose to each other, just as the indexed margins of two opposite leaves would be. In Kerria Japonica, which is only known in our gardens in a double state, the ovaries are uniformly little minute leaves, with serrated margines, bearing to the calyx an elongated point representing the style; their interior is occupied by other smaller leaves. Nothing is more common among roses than to find the ovaries converted into perfect leaves; in such cases the margines uniformly occupy the bases of the petals, and the calyx is fleshy and in the sterile sature. But the most instructive and satisfactory proof of the pistil being merely a modified leaf is to be found in the common double cherry of the gardens. In this plant the place of the ovary is usually occupied by a leaf, altogether similar to those of the branches: smaller: it is folded together; its margines are serrated, and, in consequence of the folding, placed so as to touch each other; and they occupy the place of the ovoliferous sature of a real pistil. The midrib of this lumen is attached to the station of the sterile suture of the ovary, and is not only lengthened into a process representing a style, but actually terminated by a stigma. There is thus a greater identity of function between the pistil and the other organs, more like the true stems than the branches. The pistil is seldom indeed found converted into stamens; but it often takes up itself the form of petals, as has been shown above; and although cases are very rare of petals bearing pollen, yet several instances are known of ovules borne upon petals. This occurs continually in Sempervivum tectorum.

It appears then that there is not only a continuous unbroken passage from the leaves to the bracts, from bracts to calyx, from calyx to corolla, from corolla to stamens, and from stamens to ovary, but that the order in which the parts appear in the simple form is the same as in the compound structure of that part and its peculiar combinations. Thus, the pod is a leaf which is folded up and grown together at its edges, and the capsule consists of several leaves grown together; and the compound fruit is composed of several capsules joined together. The ovary has opened so as to form a communication between them, and their edges adhering together. This is obvious from capsules, which, when ripe, split asunder, at which time se-berv intrudes upon the ovoliferous sature of one genus, in which modifications exist of the principle on which their fruit is formed; for instance, the capsules of Nigella orientalis consist of pods assembled round a centre, and partially united; in Nigella damascena their union is complete.

As it may thus be proved that all the parts of a flower are merely modified leaves, the following propositions may be stated to constitute the basis of morphology: —

Every flower, with its peduncle and bracteoles, being the development of a flower-bud, and flower-buds being altogether analogous to leaf-buds, it follows as a corollary, that every flower, with its peduncle and bracteoles, is a metamorphosed branch.

And further, the flowers being abortive branches, whatever the laws are of the arrangement of branches with respect to each other, the same will be the laws of the arrangement of flowers with respect to each other.

In consequence of a flower and its peduncle being a branch, it follows by the same reasoning that all those leaves which constitute bracteae, floral envelopes, and sexes, are subject to exactly the same laws of arrangement as regularly formed leaves. (Lindley's Outline of the Forms of Plants, Part I."

Therefore all the theories of structure inconsistent with these propositions must be vicious.

The reader who would occupy himself further with this curious subject, may consult Martius's edition of the Œuvres d'histoire naturelle de Gűck, Paris, 1837;
Miquel's Commentatio de Organorum in Vegetabilibus Ortha et Metamorphosi, Lugd. Bat., 1833; and Ripper's Treatise De Organis Plantarum.

Engelmann has moreover (De Anthophila Prodromus) attempted to classify the principal conclusions from normal structure, and has collected a very considerable number of cases under the following heads:—

1. Retractate Metamorphosis (Regressus), when organs assume the state of some of those on the outside of them, as flowers which, by the agency of insects, visit the various scales to stamens, stamens to petals or sepals, sepals to ordinary leaves, irregular structure to regular, and the like.

2. Foliaciaceous Metamorphosis (Virescentia), when all the parts of a flower assume more or less completely the state of a leaf.

3. Distortion of the new system of the flower, usually cohered are separated, as the carpels of a syncarpous pistillate, the filaments of monodelphous stamens, the petals of a monopetalous corolla, &c.

4. Dislocation (Aposiasis): in this case the works of the flower are broken off by the extension of the axis. 5. Viviparousness (Diapophyse): when the axis is not only elongated, but continues to grow and form new parts, as in those instances where one flower grows from within another. And, finally, 6. Prolixity of Stems of bodiless objects to a series of other objects, growing from the stem along the axis of the floral organs, so as to convert a simple flower into a mass of inoffensiveness. A very considerable number of instances are adduced in illustration of these divisions, and the work will be found highly useful as a collection of curious instances of metamorphosis.

METAPHOR (μετάφρασις, literally 'a transference'), a figure of speech which renders the subject of discourse striking, by the aid of expressions primarily referring to other objects. A common kind of metaphor is that called personification, by which the idea of a person is transfused into the mind, and feels with life, and even with feeling, reason, &c., as 'the fields do laugh and sing,' 'starren winter.' If this kind of metaphor spiritualizes the corporeal, another kind, on the contrary, embodies the spiritual, as 'the savour of life,' and 'the savour of meat,' and 'the savour of honour,' and so on. A third kind is little else than a shortened simile, two objects in the same sphere being brought together, only on account of their resemblance. To this kind belong such expressions as 'the silver moon,' 'the golden glory,' and 'the rainbow,' and 'moon,' 'gold,' and 'sun,' are connected merely on account of their obvious similarity of colour and brightness. The origin of the first two kinds of metaphor is not so apparent, for though they likewise express a similarity, yet the similarity is not of an object to another object, but rather of one idea to another, and of the mind to the mind, where there can of necessity be no sensible resemblance, is a subject for psychological investigation.

The application of certain metaphors, in all languages and from all periods, has, however, excited the notice of many critics, who have noticed their occurrence in the works of the ancients, and have ascribed them to the skill of the Latent, who remarked that 'no nation called error, light, or truth, darkness.' If we attend to the state of language, we shall find that a great part of the commonest discourse is composed of metaphors of the second kind, and that new expressions, states, and things, are in fact metaphorical. Thus we say every day: 'a man of extended views,' 'a man of good capacity, acute judgment,' &c., whereas the words 'extended,' 'views,' 'capacity,' 'acute,' evidently belonged originally to material objects, but have been applied to things immaterial by metaphor. The circumference that material objects are more apparent, that language seems primarily to have them for its sole objects, and that when a higher degree of reflection brings with it objects belonging to the mind alone, nothing is as yet formed which can transmute the words already formed, is sufficient to explain the use of these metaphors generally. But still the fact that such and such bodily attributes are universally predicated of such and such spiritual objects alone, may still furnish the state of their consideration to the curious in psychological speculation.

METAPHYSICS, a name originally applied to those books of Aristotle which followed his 'Physics,' and which has editors called 'the books after the Physics' (μετά τοις φυσιδ), refers to Metaphysics. It was variously applied, and seems to assume quite a distinct meaning as employed by different authors. With the Germans, metaphysics is a science purely speculative, which soars beyond the bounds of experience. The objects of this science are various, and the difficulty of defining the word lies in the circumstance that the very knowledge of the ideas sought requires some proficiency in the study. Hence to one altogether unacquainted with speculative philosophy it is almost impossible to explain the meaning of the word 'metaphysics' as used in this sense. The very possibility of a science beyond experience has been denied by many; and a great number of modern philosophers, and many works called metaphysical should rather be termed inquiries into the possibility of metaphysics. Thus Kant's celebrated work, the Critik der reinen Vernunft, is a mere demonstration of the possibility of the science of things beyond experience, which terminates with the admission of such possibility, and hence some modern philosophers have considered Kant as no metaphysician, but as a critic of the mental faculties, whose labours were to be the precursors of Decision. On the other hand, a work like Spinosa's 'Ethics' is purely metaphysical. He assumes the possibility of his science, and, proceeding from a number of axioms, speculates accordingly. Those who deny the possibility of metaphysics deny even the right to assume any axioms as applicable to a sphere beyond experience, and those who did assume them, as Spinoza, Leibnitz, and Wolf, were called by the Kantians dogmatists, in opposition to their own application of criticism. The great point to be established prior to metaphysics is the identity, or at least the necessary concurrence, of body and mind.

This once established, speculative inquiry may proceed, as the results of logical investigation must in such a case, of course, concern the nature of being itself; but the axioms always remain the same. In this sense, metaphysics is of no further use to any but philosophers.

METONICUS, PTOLEMY, was born at Rome, on the 6th of January, 1698. His father, once an opulent steward of Assisi, afterwards a soldier, then an amanuensis, and finally a small pastrycook at Rome, was enabled, by the profits of his trade, to place his son at a little grammar-school, where he soon displayed that talent for poetry which was so highly distinguished in him after-life. Before he was ten years old, says his biographer, Dr. Burney, he could make verses on any subject, and it was no unusual sight to see his father's porch surrounded in the evening, after school hours, by groups listening to the poetry of a child. Deeming one of these verses fit for publication, he received so high a distinction, that admiration of him was increased, and he instantly formed the resolution of adopting him. The father, Felice Trauzzi, willingly consented, and the next morning Ptolemy was consigned to the care of his patron, who changed his name to Ptolemy, and his appearance (it is said, by a change), a term expressing his situation by adoption.

Gravina immediately determined to educate his charge for the profession of law, wishing rather that he should become an advocate, well knowing that no former profession leads to fortune, and the latter to contempt and to empty fame. He nevertheless caused him to study the
antient poet, in which pursuit his ardour and success were so great, that at the early age of fourteen he produced his tragedy Giunio, written with the best of versification models. His parents did not allow it, but encouraged his devotion to the masks; and when Metastasio had reached his eighteenth year, Gravina accompanied him to Naples, that he might meet and sing with the most eminent conquerors of the versification of that city. The harmony of his verse, the grace and dignity of his eloquence, and the expressiveness of his countenance, were the topics of all conversations. Still he continued to study the law; and, to secure to others the pleasures that he was convinced to possess, entered into a minor order of priesthood.

Within two years after his arrival at Naples, his patron died, and Metastasio mourned his loss like an affectionate son. By Gravina's will he became sole possessor of all his paternal possessions of 15,000 crowns, the library, and a little estate in the kingdom of Naples. But such was the generosity, not to call it by a harsher name, of the poet's disposition, that, in the short space of two years, all that remained to him of this property was the small landed estate. He now applied to the law, and during a whole year was most assiduous in his studies under Paglietti, a moral enemy to the muse. But at the end of that time he was again attracted to his poetic pursuits, and produced an Epylos, a continuation of the Iliad, in 156 books, and a little Latin drama in verse, the Course of Althau, which likewise prevailed on him to write the drama Endimione. Under the patronage of the viceroy of Naples, he next produced Gl Orith Esperidi (the Garden of the Hesperides), and then Angelo, that play of the present time, which was most successful, and especially admired by Signora Bulgarni, better known as the Romanina. She was the first singer of her day, and performed the part of Fenos in the favoured operas. Such were her admiration and esteem for the author, that she persuaded him to renounce the law, to take up his abode under her husband's roof, and to dedicate the whole of his energies to the muse and to friendship. Feeble was the struggle between Paglietti and the Romanina; he acceded to the tempting proposal, and henceforward

"A pollo sera Musa Thesmida hollow."

His didone abbandonata was written at the request of his female friend, to whom, it has been surmised, the poet is indebted for some of the finest dramatic incidents. Such was the celebrity of this drama, that it was set by all the great Italian composers of that period, and not only established the author's fame, but brought him a large pecuniary recompense. In 1727 he accompanied the Romanina to Rome, where he produced his Semiramide, Ezio, Alessandro nell Indie, Catone in Utica, and the opera so well known by our English version of it, Ariodante. But praise was nearly the whole of the reward he reaped from his labours and labours.

In the year 1729 Metastasio received an invitation from the court of Vienna, whither he repaired, and became the successor of Apostolo Zeno, the Imperial laureate. This appointment was a great honor to him, as it was made on the recommendation of Ezio himself, who had long enjoyed the office, and had written a vast number of lyrical dramas, among which are many of the best that the Italian language can boast. (Zeno.) The stipend assigned to Metastasio was considerable for that time—8000 florins was then a large salary; and other advantages were added. This came rather opportunely, for at Rome he had suffered much from the sternness of his income, and was often indebted to his friend for assistance. To her, when he left Italy, he committed his affairs, and he was repaid with a small sum for the temporary support of his father, till he could make an arrangement of a permanent kind. His reception by Charles VI. was most gratifying, and procured everything for the future that he so pointed. During the succeeding three years, his correspondence with his "inestimable councillor and friend" amounted almost to an autobiography; but in 1734 he sustained an irreparable loss by her death, who to the last proved faithful in her attachment by accompanying him, after the decease of her husband, the whole of her property, amounting to 25,000 crowns. Metastasio however, guided in this instance, as he was in every other, by the strictest rules of honour, declined to derive any advantage from the will so generously made in his favour, and imme-

distantly transferred the husband all right to the territo-

sions. What may have been the result of the connection between the poet and Signora Bulgarni (Romanina), it is now impossible to say. From Metastasio's letter to the husband on the death of his wife, the sorrow expressed is in a tone of candour which looks as if there had been no occasion to conceal his feelings. He says: "Your lady hath been totally unequal to finding any for myself. At what age the lady died is unknown, but as she was first singer at Genoa in 1712, it is likely that she was much the senior of her husband. Metastasio's mode of life, from his first settling in Vienna till the moment of his death, was that of a poet and man of letters, who devoted his time and thoughts to the muses, to general literature, and to the conversation of persons more connected with his pursuits. In 1733 he undertook, among other pieces, L'Olimpia, which the Italians distinguished as Il divino, and his very popular racsonsetta, La Libertà. For the emperor's birth-day in 1734 he wrote the Hoppe; hoppe, which appears in every part of Europe, La Clarina de Tito, which was produced at the Teatro King, in Caldena, but not a vestige of the music remains. The same drama however was in 1736 chosen by Mozart, whose magic notes have assisted in bestowing on it immortality. It is a work of that kind, a work of genius, that the poet's operas were set as soon as written, yet not even the most eminently gifted of the original music is now known, or, we believe, to be found, except perhaps in the Imperial library of Vienna.

He continued supplying the court with lyric dramas and oratorios, and also composed himself in various detached pieces of poetry, till the year 1747, when the death of the emperor brought on the long and devastat-

ing war in Germany, and this led to the closing of the most important of his labours. He had so successfully laboured. He now employed his pen in translating passages into blank verse, the Ars Poetica of Horace, together with one of his Satires and Epi-

al sketch, and Juvenal's third Satire. He likewise wrote notes on the Greek tragedians, and translated a portion of Aristotle's 'Poetic,' adding a very learning, luminous, and ingenious commentary, which appeared in print after his decease. But though his dramatic labours for the Imperial city were suspended, he produced in 1744 Antigone for the court of Dresden, and Perseus in the same year. The latter was a bold and interesting work, which had hung on him, and restored his wasted tranquility, and it is said to have been presented to the ladies of the Imperial court, by whom it was performed, and the bold sentiments on the duty of sovereigns, which he ventured to put into the mouth of one of characters, do not seem to have offended any of the Imperial patronesses, who could listen to them with pleasure, and to those who had the courage to preach them.' His last drama was Il Ruggiero, performed in 1771 at Milan, on the marriage of the archduchess of Austria.

Of Metastasio's seven sacred dramas, or oratorios, La Passione, La morte d'Abel, and Isacco are best known; but all of them, Calsabigi justly observe, are as perfect as this kind of composition will allow. Of his cantatas, La Prima, La Parnassa, La Libertà, and La Partenza are admired by all. Of his occasional short dramatic pieces, sonnets, and other musi-

colaries are too numerous to be mentioned here; a catalogo raisonné of them is given in the work whence we have drawn most of the matter for the foregoing portion of this article. (Dr. Burney's Metastasio.)

One of the occupations of the poet when far advanced in years was the preparing corrected copies for the magnificent edition of his works printed at Paris in 1790. This was completed the first of April, 1792, he was attacked by symptoms of fever, alakot at his age, and on the 12th he expired. His remains were deposited in the church of St. Michael at Vienna. His property, consisting of a well furnished house, carriage, &c., many princely presents, an ample library, and 130,000
florins, he bequeathed to the son of his old friend Signor Martinetz, whose house was his first abode in Germany; but from this sum were to be deducted 20,000 florins for each of the executor's sisters, and 3000 for each of his younger brothers.

The genius of Metastasio, says Artega, 'may be compared to the goddess Chloris of the Greeks, who, in flying through the air, scattered roses wherever she went.' He did indeed ornament and cast a fragrance on whatever touched his hand. His recitals at the court of Zeno, W. Schlegel observes, because, having the same object in view, he showed more flexible talent, and knew better how to adapt himself to the views and the classics of the composer. A perfect purity of diction, adds the same critic to the list of his virtues, at the court of Ferdinand I. But in the eyes of a countryman, a classic author, the Racine of Italy. He has above all a ravishing softness in his verses designed for music. Perhaps no poet ever possessed in the same degree the gift of compressing in a short space situations so delicate, so touching. It is said of him, by Schlegel, that in order not to endanger his originality, he carefully abstained from reading the chefs-d'œuvre of the French stage. However this may be, we will add, that in all his works it is clear that he was no imitator; his style, his whole work signified a new strain, a new tragedy he could not excel; he had not the power to wring his heart; his life was too serene, he was too happy in himself to imagine scenes of bitter anguish, of complicated misery; but in depicting gentle grief, that grief which does not destroy the enjoyments of life; in which his soul has been described as, por excellence, the poet of love, but his most passionate expressions never are sufficed by the slightest breathing of indelicacy. His morality is unimpeachable, is so perfect in all his works he stands high; in his operas he is unrivaled.

METATARSUS. [SKELETAL.]

METELLI, a distinguished family of the Cæcilian gens in antient Rome. Those most worthy of notice are—

1. Q. Cæcilius Metellus Pius, n. c. 131, it was decreed that all citizens should be obliged to marry. The oration which Metellus delivered on this subject was extant in the time of Livy, and is referred to by Suetonius (Liv. Epit., 59; Suet., Oct., 89). We are told by Livy and Pliny that when Metellus was returning one day from the Campus Martius, he was seized by command of C. Atinius Labec, a Tribune of the plebs, whom he had in his censorship expelled from the senate, and dragged to the Tarpeian rock; and that it was with the greatest difficulty that his friends were enabled to preserve his life by obtaining another tribunus to put his veto upon the order of Atinius. (Liv., Epit., 59; Plin. Hist. Nat., vi. 45.)

Pliny refers to Metellus as an extraordinary example of human happiness. 'For besides the possession of the rich fields and water, with the title of his parents, and the name from the conquest of Macedonia, he was carried to the funeral pile by four sons, of whom one had been praetor, three had been consuls, two had enjoyed a triumph, and one had been censor.' (Hist. Nat., vi. 45.)

2. Cæcilius Metellus, who succeeded his illustrious predecessor in the consulship, n. c. 109, in order to oppose Jugurtha. He remained in Numidia, n. c. 108, as proconsul; but in the beginning of the following year he was superseded in the command by Marius, who had for-}

metarily been his legatus, or lieutenant-general. On his return to Rome, Metellus obtained the honour of a triumph. (Sallust, Bell. Jugurth.; Vell., ii. 11; Eutrop., iv. 27; Liv., Ep. 65.) [JUGURTHA.]

Metellus was censor n. c. 102. He took an active part in the civil commotions of his time, and was one of the most powerful supporters of the aristocratical party. In n. c. 100 he was obliged to go into exile in consequence of opposing the measures of the tribune Saturninus; but on the execution of the latter, Metellus was recalled from exile in the following year.

3. Q. Cæcilius Metellus Pius, son of Numidicus, belonged to the same political party as his father, and supported Sulla in his contest with Marius. Metellus received especial marks of favour from Sulla, and was consul with him, n. c. 89. In n. c. 78 Metellus was sent into Spain, where he appears to have remained till the conclusion of the war, in n. c. 72. From the year 76 Pompey was his colleague in the command; and they triumphed together at the end of the war. (Sertorius.) (Vell., ii. 20; Eutrop., vi. 5; Plut., Pomp.) Metellus was Pontifex Maximus; and on his death, n. c. 63, in the consulship of Cicero, he was succeeded in that dignity by Julius Caesar.

METEMPSYCHOSIS, (μετεμψυχωσις), derived from a Greek past participle, means a transference of the soul, or renewal of the soul, forms a part of the philosophical or religious belief of many nations. The Hindus believe that the souls of men pass after death into different bodies, either of men or animals, unless an individual has lived a most holy and religious life, and his soul bears the name of a divine essence. 'The soul passes from one state to another invested with a sublime frame consisting of elementary particles, the seed or rudiment of a grosser body. Departing from that which it occupied, it ascends to the moon, where, clothed with an ethereal form, it experiences the recompense of its works; and whence it returns to occupy a new body with resulting influence of its former deeds. But he who has attained the true knowledge of God does not pass through this form, but proceeds directly to reunion with the Supreme Being, with which he is identified, as a river at its confluence with the sea merges therein altogether. His vital faculties and the elements of which his body consists are absorbed completely and absolutely; both name and essence; and he becomes immortal without parts or members.' ('Extracts from the Brahmasutras, or Aphorisms on the Vedanta doctrine, by Bâdarânya,' translated by Mr. Colebrooke, in Trans. of the Roy. As. Soc., vol. i.)

The migration of the soul from one body to another is also formed, as is well known, a leading feature of the Pythagorean doctrine, and seems also to have been maintained by Plato, although there is considerable difficulty in ascertaining the opinions of Plato on this subject. This doctrine has also a part in the Egyptian mysteries; for, as Herodotus (ii. 123), are the first who believed in the immortality of the soul. As soon as the body begins to decay, the soul passes from one animal to another; and when it has passed through, one individual subject, terrestrial, aquatic, and winged, it again enters a human form. This period of transmigration is completed in 3000 years. Some of the Greeks, he adds, both in early times and more recently, have maintained this doctrine and claimed it as their own, and though they could mention names, he declines to do so.

METEOROLOGY, in its extended sense, embraces all physical causes which affect the state of the atmosphere or are affected by it. Hence it is connected with the phenomena of heat and cold, snow, clouds, winds, sleet, bora, snow, cold, ice, snow, blizzards, high winds, and their affections, as storms and earthquakes, and everything incident to such kinds of motion.

Our first inquiry shall be, what is the nature and what the probable extent of the terrestrial essential, as it is both the animal and vegetable life, to the distribution of heat, and to various modifications of light, the knowledge of its nature and composition is eminently useful. The air, though composed of several elastic fluids, obeys the same laws to which they are individually subject, namely, its elasticity and density at a given temperature.
are proportional to the pressure which it sustains, and for every degree of the centigrade thermometer under a given pressure it expands $\frac{1}{500}$ of its volume at the temperature zero. The density of the fluid represented by $\beta$ and the temperature by $t$ (in centigrade degrees), its elastic force will be proportional to $(1 + \beta t) \beta$ where $\beta$ represents the decimal $0.003751$ as well as the pressure sustained. Lastly, the pressure is equal to the weight of a vertical column of atmosphere of the portion under consideration as a base, and extending upwards to its extreme limit.

According to Dalton's views, the various constituent gases constituting the air are not chemically combined by the law of definite proportions, but only mechanically mixed in equal volumes of space, and produced by the sum of their independent pressures the elevation of the mercury in the barometric tube: an ingenious theory, which however appears open to objections from the known laws of the specific gravities.

Various have seen that heat increases the elastic power of air, and hence the equilibrium of a mass of air unequally heated is constantly disturbed. The currents of warm and cold air change places, the cold air moving to the warm region, and the heat, when repeated the course of the previous warm air. Thus the atmosphere is a great agent in tending to equalise the mean temperatures of climates in various latitudes. Besides, the aerial currents are vehicles for the transfer of clouds, for producing electric effects, and for the heating and cooling of objects, and are turned by the ingeniosity of man to promote his industry and extend his knowledge of the globe which he inhabits.

The atmosphere, considered as a transparent medium, has also great effects on light by its refractive power, and the secondary effects of its perfection for the diurnal course of the moon and the aqueous masses which it contains. It is the atmosphere which gives rise to the twilight, which mitigates the transition of day to night, and from the duration of which it is easy for the astronomer to compute that altitude of the atmosphere at which it ceases to act sensibly on light, either from its total absence or extreme feebleness. The altitude is from three to fifty miles above the level of the sea. Again, by the refractive power of the atmosphere distant terrestrial objects are elevated to the view when the spherical curvature of the earth would otherwise have caused them to be concealed; various effects of atmospheric refraction, as the mirage, fata morgana, &c., are all easily explained from the same refractive power under peculiar circumstances of temperature. By this medium sound is conveyed and colours are disseminated; the clouds which float in it soften the direct glare of the solar beams, and its aqueous particles, fluid or frozen, produce the beautiful phenomena of halos, rainbows, false suns, &c. Its greater specific gravity elevates the balloon, by means of which the nature of the upper strata of the air may be ascertained with the same accuracy and precision and temperature observed, which furnish data for calculating the physical limits of the atmosphere.

With regard to the extent of the atmosphere, we may consider it under two points of view: first, the extreme limits, and, in all probability, the atmospheric fluid remains attached to the earth, mathematically as a mass rotating round the terrestrial axis in the same time; secondly, the much narrower physical limits founded on its nature as an elastic fluid, and having regard to the great diminution of temperature at high altitudes.

Any particle of the revolving atmosphere is acted on by two forces, namely, gravity, which is directed nearly to the centre of the earth, and the centrifugal force produced by rotation, which is directed according to the line by which the particle would have moved outwardly along a circle on a plane normal to the earth's axis, and tends directly from that axis. The former force varies inversely as the square of the distance from the earth's centre; the latter, directly as its perpendicular distance from the equator. At any point on the surface of the atmosphere, the resultant arising from both forces must be normal to that surface, in order that its form may be permanent.

At the terrestrial equator the ratio of these two forces is known; as we ascend in the atmosphere and approach the earth's radius production, gravity diminishes and centrifugal force increases, both in this instance being directly opposite; hence it is easy to calculate the distance of a point in that radius where the two forces are exactly equal. Beyond that point the centrifugal force predominates, and no particle there situated could remain attached to our atmosphere, revolving with the earth both in its diurnal and orbital motions.

The above point therefore defines the extreme limit to which it is possible for our atmosphere to extend, and which is at a distance of about 25,000 miles from the centre, though it by no means follows that it must extend so far. The data would be necessary to give the actual extent; for instance, the height of the barometer at the surface of the sea, and the law of the diminution of temperature in the upper atmosphere of air. The figure of the extreme sphere can however be determined from some considerations, which is that of an oblate spheroid flattened at the poles, and in which the polar axis is to the equatorial in the ratio of 2 to 3.

As the phenomenon of twilight indicates an extreme degree of rarefaction in the atmosphere at an inconsiderable altitude above the earth's surface, we shall now consider some of the physical causes which demonstrate that the actual limits of that fluid are much more contracted than those above mentioned. The extreme limits of the globe limits is illustrated by the fraction $\frac{\beta}{p}$.

Representing by $p$, $t$, and $\beta$ respectively, the pressure, density, and temperature of the air at the surface of the earth, and by $p^\prime$, $t^\prime$, and $\beta^\prime$, like quantities for a portion of air at a certain elevation, it follows from the general laws of gaseous bodies that $\frac{p^\prime}{p} = \left(1 + \beta t\right) \beta$ where $\beta$ represents the fraction $\frac{\beta}{p}$.

Now the pressure measures the elastic force of the aerial particles: this elasticity cannot become negative, and therefore the pressure is either zero or $\beta = 0$. The last supposition would bring us to the consideration of the mathematical limits above treated on; the former, to the physical limits depending on the decrease of temperature at high altitudes. Hence the air ceases to be an elastic fluid when $t = \beta p = 1 - \beta = \frac{3}{2} = 266^\circ$ centigrade, or $530^\circ$ Fahrenheit.

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The direct heat of the sun being unequally distributed over different parts of the globe is the primary cause of the variation of climate: the effect of its rays is felt to a considerable depth in the sea, but its diurnal action on land is sensible only for a few inches in depth; the annual action however extends throughout the superior stratum of variables temperature above mentioned. The mean temperature of a place is generally estimated by taking the average of the diurnal temperatures during the four seasons of the year, and again taking the average of these four averages. This method is the one most used for the estimation of the climate of sea or continents, and the sea there is much greater uniformity in this respect. The first approximate formula to that effect which serves to name the heat given by the sun is the celebrated astronomer: though empirical, it is found to possess considerable exactness. If the mean temperature in degrees of Fahrenheit’s thermometer, he makes

\[ T = \frac{84 - 52}{\sin L} \]

where \( L \) is the latitude of the place. The supposed facts which evidently suggested this formula were the equatorial mean temperature of 84°, which is now generally supposed to be too high; the Polar mean temperature of 32°, or the freezing point, which, from the recent observations of Pary, Scowby, it is now known to be far too great; and thirdly, that the division of heat from the sun measured by the poles must proceed according to some even power of the latitude in order to amount to the same quantity in equal latitudes north and south, for which reason he chose the least even positive power of the latitude. However the actual quantity of land in the northern hemisphere is about three times as great as in the southern, the solar heat accumulates more in the former, and in the latter is more equable between winter and summer. Dr. Brewster has substituted for Mayer’s the formula \( T = 81 - 20 \cos L \), which has an exceedingly good comparison with observations, but for the reasons above given he has found it necessary to modify it for the New World. Mr. Atkinson has shown that the mean of the errors of Mayer and Brewster’s formulas for places nearly on the level of the sea is about +1°72 and -12. The temperatures of April and October are generally nearly the mean of the year, which also is found to vary but little in a considerable succession of years. If \( T \) be the mean temperature at an altitude \( A \) above the ground, in a given place where \( T \) is the temperature of the surface, to express \( T \), Mr. Atkinson has proposed the formula

\[ T = t - \frac{A}{251 + 240 \cdot \frac{\lambda}{t}} \]

cold the temperature -200° which is probably near the truth.

The names of Isothermal, Isochimal, and Isothermal lines have been given to lines passing through places which have equal mean summer, winter, or annual temperatures, the two former having contrary courses, and the third intermediate. The difference of latitude between places in the New and Old Worlds, on the same isothermal line, is considerable, as appears from the following table:

<table>
<thead>
<tr>
<th>Isothermal</th>
<th>Latitudes</th>
<th>Longitudes</th>
</tr>
</thead>
<tbody>
<tr>
<td>32°</td>
<td>Near Ulex, Lapland</td>
<td>67°</td>
</tr>
<tr>
<td></td>
<td>Table Bay, Labrador</td>
<td>64°</td>
</tr>
<tr>
<td></td>
<td>Stockholm</td>
<td>60°</td>
</tr>
<tr>
<td>41°</td>
<td>St. George’s Bay, Newfoundland</td>
<td>48°</td>
</tr>
<tr>
<td></td>
<td>Belgium</td>
<td>51°</td>
</tr>
<tr>
<td>56°</td>
<td>Boston, U. S.</td>
<td>72°</td>
</tr>
<tr>
<td></td>
<td>Near Rome</td>
<td>43°</td>
</tr>
<tr>
<td>59°</td>
<td>Raleigh, N. Carolina</td>
<td>36°</td>
</tr>
</tbody>
</table>

or we may average according to latitude thus:

<table>
<thead>
<tr>
<th>Latitude</th>
<th>Mean Temperature of West of Old World</th>
<th>Mean Temperature of East of New World</th>
</tr>
</thead>
<tbody>
<tr>
<td>30°</td>
<td>70° 93</td>
<td>66° 92</td>
</tr>
<tr>
<td>40°</td>
<td>63° 14</td>
<td>84° 30</td>
</tr>
<tr>
<td>50°</td>
<td>50° 90</td>
<td>37° 04</td>
</tr>
<tr>
<td>60°</td>
<td>40° 64</td>
<td>52° 27</td>
</tr>
</tbody>
</table>

2
The mean temperature in the latitude of 34° in different continents, and at places near the sea, is found to vary but little, thus:—

<table>
<thead>
<tr>
<th>Place</th>
<th>Latitude</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cape of Good Hope</td>
<td>34° 51'</td>
<td>62° 8'</td>
</tr>
<tr>
<td>Port Jackson, N. Holland</td>
<td>33° 53'</td>
<td>66° 9'</td>
</tr>
<tr>
<td>City of Buenos Ayres</td>
<td>34° 36'</td>
<td>62° 5'</td>
</tr>
</tbody>
</table>

The sea varies in temperature much less than the air; the region of warmest water extends about 54° on each side of the equator, but rather farther to the south than to the north. Its greatest cold appears to be at the pole, attributable to the different propagation of heat in the New and Old Worlds above remarked. Dr. Brewster supposes them to be about 80° of lat., and situated in 95° E. and 100° W. long. the temperature at those points seems to be decidedly below zero of Fahreinheit.

The production of winds in the atmosphere, we have already stated, is mainly attributed to the unequal distribution of heat in the atmosphere. The attractive action of the sun and moon on that fluid, though producing atmospheric tides, which have been recognized by barometrical observations, could only produce a tropical wind with a velocity of 4 miles per day, which would be evidently inappreciable amongst the numerous disturbances arising from temperature; but when the action of the sun be balanced by the tropical heat, it produces some well-known winds in the following manner.

On account of the annual accumulation of heat from the solar rays between the tropics, two currents of air from the north and south rush forward to occupy the place of the moving atmosphere. Nor must the rotation moves from west to east, these currents appear to deflect to the west on account of the increased velocity of the parallels of latitude near the equator, which have greater radii than the arctic parallels, the approach of one being towards the other by the excess of matter in the sphere described in rotation by the equinoctial above that described by the tropical and even polar circles; the velocities perpendicular to the equator, being nearly equal and contrary, produce no sensible wind, but those parallel to it produce a wind directly west and enduring, called the 'trade wind,' with this exception, that the northern hemisphere being the warmer, the resultant is a few degrees north of the equator, crossing the Atlantic from Africa to Brazil, and the Pacific from Panama to the Pribilofs, and the St. Indies from Sumatra to Zanzibar. But when the continents stretch into the torrid zone, the local accumulation of heat being great, two opposite periodical winds, known by the name of monsoons, are produced, approaching the north tropical current on the south side of the Arabian and Indian seas north-west from April to October, and in the contrary direction during the rest of the year: the reverse occurs south of the equator.

Now as the currents rush into these continental regions, expelling the air of that locality between 28° on each side, the latter forms a countercurrent, still possessing equatorial velocity, and produces in both hemispheres exceeding the above latitude a westerly and genial breeze, which is felt during three-quarters of the year from Newfoundland to the west of England, and from South America to the Cape of Good Hope. On the same principle the easterly, or rather north-easterly winds originate in the polar currents, and are piercingly cold in general. The great radiation of arid plains produces many local winds, such as the sucon of green-bay from Africa to Italy, and the destructive airm of Arabia, &c., but they do not depend on general atmospheric causes.

The meteoros so frequently visible in summer and in frosty weather have not yet received a satisfactory explanation, that the most ingenious men have been at the expense of examining the invisible maleable gases in the atmosphere: this undoubtedly is the case in the ignus fatus, which, as the writer has witnessed, will change the direction of its motion by the slight current of air produced by a person walking to the right of it; but it is not yet able to test with great accuracy the gaseous matters which may occupy the higher regions of the atmosphere.

The asteroids of November, so well described by Sir W. Herschel, have in all probability an origin independent of the sun, from the regularity of their appearance about the 18th of that month, but having now become subjects of curiosity and very general observation, we may hope ere long to learn something more precise of their nature, and to take another opportunity of noticing them more at length.

Among subjects connected with meteorology which are treated in separate articles, we may notice Cloud, Dew, Atmosphere, Air, Barometer, Thermometer, Hygrometer, Mist, &c., to which articles the reader is referred.

Methodism, a very memorable word in the English vocabulary, the thing signified is also the most memorable in the history of the Christian Church, and especially of that part of it which consists of inhabitants of the British Isles.

The people of England have been described by foreign writers as being beyond all other nations religious, or very strongly devoted to religious observances. The State of salvation on the island was so interesting, the period of introduction into this island is one proof of it; but still more is the great encouragement given to the religious orders and the multitude of churches which were erected in the very earliest periods. A few centuries have produced the proof of the earnestness of encouragement which the different orders of friars received, who were a species of Methodist preachers of the middle ages. Again, when the system of Christian instruction and edification as settled by authority was in complete operation, there were for ever arising large and powerful bodies of people who pressed for something more exciting, greater freedom, greater holiness, or greater labour in the ministers, each distinguished by its own peculiarities, but all exhibiting that part of the national character to which we have before referred, so strongly impressed with the important truths of religion, and earnest in the desire to please God, and make their own calling and election sure.

Each century seems to have had its schism arising in this national characteristic. In the sixteenth century the Lutherans were brought by the Reformation: in the seventeenth, the Puritans, who were for a short time triumphant, but who have since scattered in all directions. In the eighteenth century, still existing, the Presbyterian, the Independent, the Baptist, and the Quakers. In the eighteenth century, when not only the Church but the several dissenting bodies were thought by many to have lost much of the spirit and power of their founders, and to have produced a people, differing little from the Papists, the Methodists, still existing, the Presbyterians, the Independent, the Baptist, and the Quakers. In the eighteenth century, when not only the Church but the several dissenting bodies were thought by many to have lost much of the spirit and power of their founders, and to have produced a people, differing little from the Papists, Methodism then designates the great English schism of the eighteenth century differing little in essence from the Puritanism of the century before. In both cases it was the desire of services of a more exciting character than were furnished by the Established Church, but in the latter case the Christian religion in England, and the desire of a greater admixture of doctrinal matter in the instruction which was delivered from the pulpit. Evangelicalism is a kind of form of Methodism, but is perhaps sufficiently characterized for us to consider it as the manifestation of the extreme of religious feeling in the nineteenth century. The chief difference between Puritanism and Methodism lies in this that the Puritans had within their body a much larger proportion of persons of rambunctious Opinions, and that they never contemplated the attainment of their object by the introduction of an iliterate ministry. In the Methodists of the last century were not found many great, not many noble, and the instruments of the propagation of Methodism were, with very few exceptions, personal communication from the lower classes of society, men without learning or attainment, and supposed to be qualified for the work chiefly by possessing qualities which are indeed truly valuable in a Christian teacher, zeal for the promotion of holiness and virtue, and a familiarity with the profession of Christianity, and an intimate family, in the female portions of it, took it under its patronage, and there were two or three other ladies of rank who attached themselves to the Countess of Huntingdon, who encouraged the labours of the Methodist preachers. But the spirit of Methodism is an infinite one; we may regard it as identical with Evangelicalism, obtained the countenance of many persons high in rank. The change is chiefly to be attributed to two persons, the late Mr. Whitfield and the late Mrs. Robinson, who were Methodists in one sense of the term, but not in the other and more common sense of it; that is, they continued on the Church pleading for greater strictness of life and greater zeal in the ministry, more energetic preaching of what they held the distinguishing marks of Methodism, more assiduous labour in the clergy; but not, like Lady
Huntingdon, forming societies and placing pastors over them, who were to be dissenters, and not comprehended in any way within the pale of the Established Church.

It is interesting to observe the various forms in which Methodism is presented. We see it in the Church of England in the character of those ministers and congregations which are called Evangelical; we see it in a large body of dissenters who call themselves Independent or Congregational; and we see it in respect of that class of persons which are called the Methodist sects, and which are in fact so many different classes of persons who collectively are called Methodists. There are:—1, the Wesleyan Methodists; 2, The Primitive Methodists; 3, the Methodists of the New Connection; 4, the Primitive Methodists; 5, the Bible Christians; 6, Protestant Methodists; 7, Association Methodists; 8, the Inghamites. There is also a large body of persons, chiefly in Wales, called the Calvery Calvinistic Methodists, who were not included in what is called Lady Huntingdon's Connection.

The year 1729 is considered as the time at which Methodism began. John Wesley, who is universally considered as the founder, was at that time residing at Oxford, being a member of that university. A brother, whose name was Charles, was residing at Oxford at the same time, and there were a few other young men who, like them, were interested in the subject of religious improvement in the Church of England. They were soon remarked for a great spirit of simplicity, life and for wearing more of the form of religion than was then usual at Oxford. It is said that these persons very soon got the name of Methodists, arising out of a casual observation. But whatever may be said of the origin of the name, this new sect of Methodists sprung up; but to what set of persons in ecclesiastical or other history he referred is not quite settled. The name, it is manifest, is a very absurd one.

The Wesleys were sons of a country clergyman who resided on his living at Epworth in Lincolnshire, a part of the kingdom where at that time the inhabitants were singularly rude and unformed. It has not been remarked by the writers of the life of Wesley that his father was educated for the ministry and held his calling, but continued to the Church early in life. It is not intended in this article to give a biographical notice of the founder of Methodism. This will be given in its more appropriate place. [WESLEY.]

Under the word WHITEFIELD will also be found a notice of George Whitefield, another student at Oxford, who joined the Wesleys in 1732, and who had a large share with them in laying the foundation of Methodism. It may suffice for the present to say that the Wesleys and Whitefield, instead of being interested in the religious class of society, spent all their lives in labours, after studying in the university, undertook the wider duty of rousing their countrymen generally to a higher tone of devotional feeling, and to a regard to the doctrines of the Church, to which there was then, owing in a great measure to the labours of the Presbyterians and Independents, a great deal of driftiness among the dissenters and ordinaries divines originally and, after them, of Locke, Addison, Burnet, Hoadly, Clarke, Whiston, Peirce, and others, a growing indiffercence: men were beginning to think that the all-in-all in Christianity was the doing justly, loving mercy, and walking humbly, looking for that blessed hope and glorious appearing of our Lord and Saviour Jesus Christ, when every man should receive according to his works. Wesley went forth proclaiming that he came to exhort men to old England preaching, his favourite phrase, as appears by many passages in his journals, and this object (at least, at last) was what he himself considered the chief purpose of his mission. What he meant was original sin, regeneration, the stoning by the world and the Lord's day, heaven and hell, the salvation of one soul by the faith, freedom of the will, accountability, and eternal reward or suffering; Whitefield added to these the eternal decrees, the extreme doctrines of Calvinism.

The object of neither of them was to founds of society in the Church; the object was to promote the change within the Church. It was soon however manifest that their end could not be attained by remaining, even outwardly, conformable to the rules of the Church in regard to its ministerial offices. As a consequence of this, they past churches, congregations against them, and the meeting-houses of the dissenters were closed likewise. They then preached wherever a congregation could be gathered together, in rooms or in the open air, and preaching with the zeal and energy of Apostles, it was in vain, with a population like the English, to attempt to prevent them from making a deep impression. Such energy of preaching had not been witnessed since the time of the old Puritans. The effect indeed must be described as marvellous. The cry, "What shall I do, that I may be saved," was heard from many voices wherever they had an audience; sometimes this cry was accompanied by dreadful shriekings and faintings. The accounts given by friends and enemies of Methodism, even at that time. Many thought it was regarded only as a mischievous enthusiasm. By the profane the preachers were not unfrequently assaulted, and their lives placed in jeopardy. But many were soon found who were willing to assist them in their work, either by forming into societies personally in behalf of the poor, and helping them in their wants, or by being a part of the church out of which they had been expelled, or by hiring rooms for their assembling together, or by taking upon themselves the office of preacher, and following in the track which their masters had trod. There were at the same time a few persons who were ministers in the Church, and who did not leave the parishes in which they were settled, who seconded the labours of these men. Such were Fletcher, Sutton, Perrottet, Dickinson, Venn, Grimshaw, and others. Whitefield died early, worn out by his extraordinary exertion. He was the founder of the Calvinistic section of Methodists. But the life of Wesley was prolonged to his eighty-seventh year; and when he died, which was in March, 1791, he had been sixty-five years in the ministry, and nearly twenty years an itinerant preacher; he lived also to see in Great Britain and Ireland about a thousand local preachers and a thousand of what are called local preachers 'raised up from the midst of his own people,' and eighty thousand persons in the societies under his care.

Such was the first principal branch of Methodism at the time of Wesley's decease. Some thought that as it had grown with him, it would die with him; but they were mistaken. He had provided (as far as human means go) for its perpetuity by binding up his members in an oath with respect to each other, and a covenant with the Church early in life. This had been given in its more appropriate place. [WESLEY.]

It was in the year 1740 that the first Methodist society was formed. It met at a chapel in Moorfields, and it was in 1743 that the rules, which still continue in force, were drawn up for this and other societies, especially those of a more primitive character. Wesley began his labours at the beginning of his ministry, Wesley had chiefly laboured. These rules set forth, that the Methodists are a people who, in addition to the form of Christianity, seek the power of godliness, and manifest it by good works: the societies are united, that by counsel, exhortation, and prayer, they may assist each other in the great work of religion.

We have next to describe the constitution of these societies and of the general union of them, forming the highly important class of Christians called the Wesleyan Methodists. These societies are divided into classes of ten, twenty, or more persons, and he that is supposed the best qualified by mental and religious excellency, is appointed the leader. The members agree that the leader's task is to preside at the meetings, and direct the business; to give the members their proper share of the advantages of his class, and to take the amount to what is termed the 'leader's meeting,' that is, the stated meetings of all the leaders and the society stewards in a certain locality, where the society of the place is represented, and its financial arrangements made. The monies from the leaders, pay the ministers their weekly stipend, and take the surplus to the circuit stewards at the quarterly meeting. In the leaders' meetings are stewards for the poor also. The officer to whom they are to be given to the leaders, for their poorer members, whatever funds may be furnished by any society and congregation for that purpose. A number of these united societies lying around some cen...
tra town or large chapel is known as a circuit. The villages or
or chapels in the vicinity of the centre are regularly visited by
the ministers at stated times for the purpose of conducting
the business of the circuit through the agents or other
ministers. The origin of Methodism these circuits included not merely
one county, but sometimes parts of several; but now, owing
to the spread of Methodism, the circuits are limited to a dia-
meter of twenty, ten, and in some cases of fewer miles. The
society meetings in these circuits are committed to the care of the
ministers yearly appointed by the Conference; and more espe-
cially to one who is termed the superintendent;
generally, when compared with his fellow-ministers in the same
circuit, he is of the longest standing in the connection, but
the Conference may appoint the Conference to his
appointment; the person whom it judges the most
proper. To the superintendent principally the direction of
the other ministers is committed, as well as that of the
local preachers also, who are dependent on the
superintendents; and in addition to the above, the superin-
tendant has the care of the leaders, stewards, and, in one
sentence, the whole circuit: he is accountable to the Con-
ference for the use of the power committed to him.

About the transaction of the business of the Circuit, the
ministers, circuit-stewards (who are two principal members in
each circuit, nominated yearly by the superintendent and chosen
by the quarterly meeting), society-stewards from every sepa-
rate society in the circuit, and other leading friends meet, for
the purpose of transacting the business of the circuit.
This business consists of the accounts of the separate societies, the
balances, if any, from the society-stewards, out of which the circuit-stewards pay the quarterly
stipends of the preachers, balance all the accounts of the
circuit, and determine everything within the province of the quarterly meeting, according to the Statutory Laws of
Methodism, which are found in the 'Minutes of Conferences.'

A number of these circuits, as for example the collective
number in any county, are united and known as a district.
The Conference appoints one of the ministers of the
circuit, by ballot, as the chairman; to whose care its Methodistical direc-
tion is chiefly committed. In the month of September in
every year the superintendents of the circuits in the district,
and the circuit-stewards of each circuit, are called together in a
equatorial annual circuit, to arrange prospectively the
financial affairs of every circuit therein, for the coming
Methodist year; that is to say, the probable amount that the
connectional collections will be able to supply to every
needful circuit, and the circuit-stewards of each circuit, to
supply from its own resources whatever may be deficient.

In the month of May, the district, as above, is again
assembled; the ministers alone the first day, to examine
the moral character, Methodistical orthodoxy, and obedience of
the society-stewards; the second day, according to the presentation of the
circuit-stewards, they wind up the financial affairs of the
circuit for the Methodist year, which in May has nearly
expired. The result is carefully recorded in minutes, which
are authoritatively required from every chairman of every
district, and sent to the connection at the next Conference.

At the May district-meeting, when the circuit-stewards have taken
their departure, one of its ministers is chosen
by ballot, as its general representative at the coming Con-
ference. Then the meeting determines how many additional
ministers belonging to the district shall be allowed to proceed
to the Conference. The Conference, strictly and truly, con-
stitutes only of one hundred preachers, whose names are in the
deal that gives it a legal existence, but all the preachers
allowed to go to the Conference, and who have suffered the
sacred office, and vote as integral parts thereof. At the assem-
bling of the Conference, one of its first acts is the choosing
by ballot the president and secretary, who must be of the
hundred, the legal Conference. The business which fol-
sows consists of the visiting the places of those who,
by death, &c., have been removed, by the hundred, partly
by ballot and partly by nomination; the examination of the
character of every minister as to his moral conduct, Meth-
odistical orthodoxy, &c.; the examination of the minutes of the
superintendents; the appointment of the ministers for the
coming year. Further, they legislate for and determine the
multifarious concerns of the connection.

In Methodism, the members are divided into two great
classes, the ministers and the people; and each, if accused,
is tried at its separate tribunal, and by its own peers. The
members are tried by the leaders' meeting; and the ministers
by the ministers only, at a district-meeting. If either the mem-
bers or ministers are dissatisfied with the decision of their
respective judicators, they may appeal to the Conference
the highest court of Methodism.

The Conference for its ministers from the members, who
first are known as local preachers, and then nominated at the
March quarterly meeting as persons proper to be recom-
manded for examination at the coming May district-meeting
by the ministers alone. If the churches in the circuit, by their
representation at the quarterly meeting, recommend the
person nominated, he appears before the district-meeting
and undergoes an examination as to his personal acquaint-
ance with Christianity, his Methodistical orthodoxy, and
attachment to its discipline. If approved and recommended
by the Conference, he is at the next district-meeting, his
name is recorded and referred to the Conference. If all inquiries here are satisfactorily met, he is either immediately employed as a probationer, in which state he must continue for four years, before he can be
admitted into full connection, that is, a minister, and only in
such places as the Conference may appoint; or he may be placed on the list of reserve, and if approved, when again examined by the preachers in the London district, he will be admitted
to the Theological Institution, and by training for some
other place of usefulness. The doctrinal test of the Methodists is found in certain
volumes of Mr. Wesley's Sermons, and his notes on the
New Testament. Among the most prominent of these
doctres, next to the being of God, his perfections, and
eternity, is the doctrine of grace, the atonement, general redemption, justification by faith, the witness and work of the Spirit, entire regeneration, good works as the fruits thereof, eternal life, and ever-
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science (1338) as under the care of their foreign missionaries in their various stations was 66,808.

This is to be regarded as the state of only one branch of Methodism, a principal by Hain and undoubtedly, or rather, the main branch, but there are the several branches besides of which we have already spoken, each with chapels, preachers, and numerous members, and most of them having some special missionary service for the extension of the know-

Some of them have separated from the main body of Methodists since the death of Mr. Wesley. The respect paid to him has not been so generally transferred to the hundred ministers, in whom he vested the power of managing the affairs of his community, as he probably wished and expected.

In 1733 great dissensions existed about the sacraments, whether they should or should not be administered by the ministers, in the chapels, to the members of the society who required them as a part of Christianity. This led to recesi-

With these concessions many were not satisfied, and, being led principally by the Rev. Alexander Kilham, they seceded at Methodism, a principal by Hain and undoubtedly, or rather, the main branch, but there are the several branches besides of which we have already spoken, each with chapels, preachers, and numerous members, and most of them having some special missionary service for the extension of the know-

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England by Harriot in 1610. (See the 'History of Optics,' by Mr. Barlow, in the Encyclopaedia Metropolitana.) Weiss adds (Dee. Univers.) that Metius guarded his secret with such extreme caution, that, even to die, the priest who attended him could not induce him to divulge it; another story is that he confided the secret reluctantly to Prince Maurice, on an occasion when that prince honoured him with a visit for that especial purpose. We have now reached the year in which James Metius was born, or that in which he died.

METON, METONIC CYCLE. The astronomer Meton was living at Athens at the beginning of the 8th Olympiad, B.C. 432. He was, according to some, a Lacedaemonian (authority of Callisthenes cited above). All we know which is worth recording here is, that the solstices which he observed with Euctemon are preserved by Ptolemy, and that he was the founder of the celebrated lunar cycle which is still observed by the Western churches in their computation of Easter.

The Metonic cycle takes its rise as follows: 235 revolutions of the moon are very nearly 19 revolutions of the sun, and one complete revolution of the moon's node. If these approximations were exact, all of the eccentrics, and moon particularly those of eclipses, would recede in the same order, at the end of every nineteen years. There is however an error of some hours in every cycle. (Calippus; Moon; Period of Revolutions.)

The first year of the first Metonic period commenced with the summer solstice of the year 432 B.C.; and if the reckoning had been continuous, what is now called the golden number of any year would have denoted the year of the Meton, if the summer solstice had continued as the commencement of the year. On reckoning however it will be found that A.D. 1, which is made the first year of a period of 19 years, would have been part of the fourteenth and part of the fifteenth of a Metonic cycle.

METON (or Meto). J. R. R. LILIEVO.

METOPIA (Ornithology), Mr. Swainson's name for a subgenus of Pipra.

METRE (from the Greek μέτρον, metron) is that quality of verse by which it is to the ear distinguishable from prose. It is a general term, embracing all the essentials of poetry: imaginative thought being the other. No reason can be assigned for this opinion, the truth being that it is attributable only to our nature as men, by which the pleasure is in the rhythmic arrangement of words, and consists of that charm which cannot be easily written as perfect, unless couched in metre.

A distinction has been drawn between ancient and modern metres, one being said to depend on quantity, the other on accent. And while we may further explain the latter to differ in kind. A little reflection however will tend to convince us that delicacy of ear has as much to do with the difference between ancient and modern metres as any fancied change from quantity into accent.

Chaucer still retained the delicacy of ear, as we know from the marked difference in Italian between the pronunciation of double and single consonants, a difference to which our language is a stranger as far as time is concerned. Though we see no distinction in time between the second syllable of words laboro and liberare, there is no reason why the Romans should not, and with that assumption the whole difference between accent and quantity vanishes. It would be useless to enumerate the names which have been given to metres. The Greek and Roman metres were known to be numerous, in allowing collocations of syllables (called feet) such as we could scarcely feel to be consonant with rhythm. The cause of this difference seems to lie in the form of each language. 

The greater grand distinction between ancient and modern metres is that of rhyme, which occurs but seldom in the former, and which, until the time of Shakspeare, was nearly universal in the latter. Ancient and modern languages being the same, the arrangement of the alliterative measure may be traced in the older Latin writers, and was the distinguishing peculiarity of the Anglo-Saxon verse. 'Piers Plowman's Visions' are the best known compositions of this kind. Those who seek for further information on the subject of English metres, particularly on peculiarities which have occasioned so much difficulty to the readers of Chaucer, will do well to consult Mr. Guest's 'History of English Metres.' Some observations by Coleridge, prefixed to 'Christabel,' are also worth attention.

METRIORHYNCHUS, Dr. Hermann von Meyer's name for a new, allied Gaur, found, according to him, in the hills, the Oxford clay, at Honfleur, and the Kimme ridge clay at Havre.

Example, Metriorhynchus Geoffroy (H. von Meyer), 2nd, Gabriel de Honfleur, Curr., 'Oss. foss.' v, 2, pp. 149-152; 'Oss. foss.' v, 2, pp. 149-152. Metriornone (from μητρον, measure, and υφίστα, a division; also, a song), a very ingenious instrument, a pendulum, the point of suspension of which is between the extremities, terminated, and introduced about the year 1614 (M. de Lescarre and M. de Maupays, Messiah of the Louvain, 2nd, Messiah of the Louvain, 2nd, emperor of Austria), for the purpose of determining the movement, i.e. the quickness or slowness of musical compositions.

The utility of a time-measurer, both to composers and performers, and for some account of its early use, see chronometre.

Of Maelzel's Metronome there are two kinds. The one is a pendulum kept in motion by a spring and wheelwork. And the other vibrational, as above described, but without any machinery, and acting only so long as the force of the impulse given shall last. The former, therefore, it will be obvious, is complicated and expensive; the latter is simple and cheap.

The present article describes and explains the manner of using this instrument:

1. A sliding weight is attached to the rod (which is graduated or steel pendulum); the higher up this weight is shifted, the slower will be the vibrations, and vice versa. It is obvious that when the weight corresponds with the number 34, the vibrations will be the slowest possible; at No. 169 they will be the quickest.

2. These numbers have all reference to a minute of time; i.e. when the weight is placed at 56, fifty beats will occur in each minute; when at 60, 60 beats, or seconds, exactly in a minute; when at 100, 100 beats in a minute, &c.; any stop-watch, therefore, will show how far the correctness of the metronome may be depended on.

3. The double of the numbers of the scale answer to a precisely double degree of velocity. Thus, if 58 be the number for a minim, 116 will be the number for the crotchet in the same movement, &c. The numbers omitted on the scale have been found practically unnecessary.

4. The composer vibrational—i.e. the judge, from the nature of his movement, whether to mark by minim, crotchets, quavers, &c. Generally speaking it will be found, that in adagios it is most convenient to mark the time on the Metronome by quavers; in adagios by crotchets; in allegros by quavers in groups of bars. As often however as the case may admit, it is desirable that the pendulum should be made to beat integral parts of a bar, just as a master would beat or count the time.

Such opposition was made to the use of this excellent instrument, when first introduced; but no sensible composer or performer now entertains a doubt of the usefulness of the Metronome, or of some kind of pendulum answering the same purpose.

METZ, a city in France, capital of the department of Moselle, situated on the Moselle at the junction of the Seille; 172 miles in a direct line east by north of Paris, or 191 miles by the road through Château-Thierry, Châteaux, and Verdun; in 49° 46' N. lat. and 7° 13' E. longitude.

This city existed in the time of the Romans, to whom it was known by the name Divodurum, and was the chief town of the Mediomatrici, one of the Belgo nations. At a later day the name of Metz was added to it, which, early in the fifth century, was substituted the shorter designation of Metiss or Metisz, whence the modern Metz.

In the civil disensions which followed the death of Nero, A.D. 68, Divodurum was nearly destroyed in the year 69 by the troops of Vitellius. (Tacit. Hist., ii. 8.) Divodurum was ruined in the invasion of the Huns under Attila, A.D. 452; but afterwards became the capital of Austrasia, which was sometimes termed the kingdom of

METZ was comprehended in the kingdom of Lotharingia or Lorraine.
The grants of the emperors to the bishops of Metz, Toul, and Verdun, rendered those prelates feudal lords of their respective dioceses, subject only to the supremacy of the pope; and this system of Lorraine became known in history as Les Trois Évêchés, 'the three bishoprics.' The city of Metz was however made, by the emperor Otto II., a free imperial city, with a voice in the diet of the empire, the right of choosing its own magistrates, and of contributing to the expenses of the war; the city being the centre, apparently, of a great inland trade between France and Germany; and in A.D. 1444 was enabled to resist an attack from the combined forces of Charles VII. of France, and René of Anjou, king of Sicily and duke of Lorraine, for the possession of which the city had also once been the centre, and which appearance had occasioned some troubles at Metz; but the principles of the reformers made such progress, that A.D. 1543 they were allowed the free exercise of worship. In the troubles of the empire near the close of the reign of Charles V., Henri II. of France, with whom the German Protestant princes had formed an alliance, entered Lorraine with an army, and was admitted into Metz by the towns- men, A.D. 1552. In the same year the emperor besieged the place with 100,000 men, but the duke of Guise, who commanded the garrison, made so stout a defence, that the emperor was obliged, in Jan., 1553, to raise the siege. From this time the town remained under the protection of France, though the bishops recognised the authority of the emperor; the city was divided into trade and population; and at the close of the seventeenth century, the town numbered only 22,000 inhabitants.

In the division of France before the Revolution, Metz, with the county, passed to Bavaria; and in 1813 was seized by the French. It has a quarter of a million inhabitants, including the city and the provinces included in the province or municipal government of Lorraine.

The Moselle and the Seille are divided in and near the town into several channels, enclosing small islands, on some of which, as well as on the mainland, the town is built. Metz is a fine Woollen Manufactory.

There are nine gates with drawbridges. The interior of the town, which is principally in the angle formed by the two rivers, is in general handsome. The streets are wide, straight, and well paved. The square called 'Quartier Coceur,' in the centre of the town, in memory of the hospitable and the esplanade of the citadel affords a pleasant promenade. The square of St. Louis is surrounded with arcades. The houses are for the most part well built. The cathedral is a Gothic building, remarkable for the boldness and lightness of its pointed arches, and the length of its nave is estimated to be 963 feet (probably French feet, equal to about 387 English feet), and the height of the tower at 373 French, 396 English feet. There are nine other churches, four nurseries, a convent, a hospital, a remarkable university, a Jewish synagouge. The Jews had formerly a particular quarter of the town assigned to them, which is still distinguished by its dirty and narrow streets. The most remarkable of the churches are those of St. Simon, Notre Dame, and St. Vincent, the last distinguished by a portal with a triple row of columns. The town hall, the Palais du Gouvernement, built at a great expense in the reign of Louis XVI., where the courts of law sit, the prefect's office, the theatre, a building of greater external than internal beauty (these last being, in the Moselle, the royal college or high school, the military hospital, a vast building, the arsenal, the different barracks, the building for the school and staff of the artillery, the workhouse, and the covered market, lately erected,—are among the public buildings most worthy of notice. There are twenty bridges, ten over the arms of the Moselle, and as many over those of the Seille.

The population of the town has been gradually increasing since the commencement of the eighteenth century. In 1718, it was 25,000; in 1741, 32,000; in 1814, 41,000; in 1831, 44,416; in 1856, 42,793. The chief branches of manufacture are woollen cloths, flannels, and stuffs, cotton yarn, leather (formerly the staple of the trade, diminished by the continuance of war, and the exigencies of the navy, hat-strings, braids, and embroidery (in which 1200 people are employed), starch, soap, beer (which is very good), brushes, pencils, iron wares, cutlery, buttons, jewellery, clocks, paper-hangings, and confectionery. There are workshops connected with the arsenal and other military establishments. In the neighbourhood of the town are quarries of good limestone, tile-kilns, beet-root sugar-houses, and other industrial establishments. Trade is carried on by the rivers of the Moselle, which is navigable to Nancy, many miles above Metz. High roads communicate with Luxembourg, Namur, and other places in Belgium; with Mainz and Frankfurt in Germany; and with London, Paris, and Rome.

Metz is the seat of a bishop's see, ecclesiastical, secular, and jurisdictional, which comprehends the department of Moselle, and the bishop of which is a suffragan of the archbishop of Besançon. It has a Cour Royale and an Académie Universitaire, the jurisdiction of which is divided between the two departments of Moselle and Meurthe-et-Moselle. Here are also the head-quarters of the military division, including the departments of Moselle, Meurthe, and Moselle. There are a variety of other government offices, judicial, and administrative. There are also a number of establishments connected with the military department, a royal practical school of artillery and military engineering (the finest institution of the kind in Europe), regimental schools of artillery and engineering, a central military Polytechnic school, and a miners' school. For general or special instruction there are the faculties connected with the Académie Universitaire; a college or high school, a normal school, a society of literature, science, and art; a society for the encouragement of agriculture and of mechanic society, free schools for poor children, schools for drawing, painting, music, and geometry and mechanics applied to the arts; public lectures on midwifery and botany, a school of trade, a society for the encouragement of elementary instruction, a departmental society for science, a society for the encouragement of arts and trades, maintained by the wealthy Jews (of which nation there are many at Metz) for their poorer brethren; a maternity society, and a mont de pitié, or loan society; a public library, a library of 31,000 volumes, three other libraries, a botanical garden, a departmental nursery-ground, and museums of natural history and mineralogy. There is a school or schools taught by the Frères de la Doctrine Chrétienne, with a thousand pupils. The amonissement of Metz comprehends an area of 629 square miles: it is divided into nine cantons or districts, each under a justiciary of the peace, and comprehends 218 communes. Its population in 1831 was 150,840; in 1856, 150,811.

In the neighbourhood of the town are the remains of a Roman aqueduct, which conducted the waters of a stream, seven or eight miles distant, to the Naumachie, which was in the south part of the town. Seventeen arches of this aqueduct yet remain. The ruin is an amphitheatre and of a Roman palace have been discovered.

The territory known as Le Pays Messin comprehended the territory immediately around the city, included in the diocese and jurisdiction of the bishop, to which alone the name was in strictness applicable, and the lordships scattered through Lorraine, which formed part of the temporalities of the see. The former is entirely and the latter are partly comprehended in the department of Moselle; some of the lordships are in the departments of Meurthe and Moselle.

MEUDON. [Seine et Oise.]

MEULAN. [Seine et Oise.]

MEULEN, ANTHONY FRANCIS VAN DER, born at Brussels in 1743, the disciple of Peter Strugeon, was an eminent battle-painter, under whom he improved with extraordinary rapidity. While he was pursuing his profession at Brussels, it happened that some of his works were taken to Paris, and shown to the minster Colbert, who was so pleased with them that he invited him to Paris on very honourable and advantageous conditions. His talents as a battle-painter recommended him to Louis XIV., whom he always accompanied in his campaigns. He designed on the spot most remarkable incidents, and the effects of the cities, fortresses which had been destroyed, and of the most memorable victories, and from these sketches he composed the paintings which were to perpetuate the remembrance of the king's successes. Such opportunities as that perfected his art, and his numerous works give such evidence. They are distinguished by truth to nature, excellent colouring, freedom of touch, and the happiest distribution of light and shade. No painter excelled him in designing the motions and attitudes
of horses; and this induced his friend Le Brun, whose niece he married, to give him to the execution of the horses in his celebrated paintings of the battles of Alexander the Great. Van der Meurs painted also in 1608, and other subjects, with equal excellence. His principal works are at Paris; but many of his easel pictures are preserved in England, France, and Flanders. In the 16th and 18th vols. of the Encyclopédie, Roë, there is an engraving of his portrait. He was chosen member of the French Academy of Painting in 1673. He died in 1699, at the age of 56 years. His most celebrated scholar was L. Van Huchtensburgh, battle-painter to Prince Eugene.

MEURS, JOHN (the Latinized form of his real name, which was De Meurs), was born near the Hague, in 1579. He was educated at the university of Leyden; and after he had completed his studies, was entrusted with the education of the children of Barneveldt. [BARNEVELDT.] In 1610, Meurs was appointed professor of history at Leyden, and in the year following professor of Greek. After the execution of Barneveldt, on the 14th of May, 1619, Meurs was exposed to great annoyance and persecution from the enemies of his illustrious patron; and it was therefore with great pleasure that he accepted an invitation from the king of Denmark, in 1625, to settle in his dominion. Meurs died on the 20th of September, 1639.

Meurs was a sagacious and laborious scholar. He edited some Latin and Greek writers, and wrote many works on historical and archaeological subjects, which were collected and published by Lami, Florence, 1741-63, 12 vols. folio. The following are a few of his principal works:—1. 'De veteribus barbaris; 2. 'De actibus Veneris in Africa; 3. 'De actibus Veneris in Ruthenia.' He wrote also on different branches of Greek and Roman antiquities, most of which are reprinted in the 'Thesaurus of Graevius.' 3. 'Rerum Belgicarum Liber Primus,' Leyden, 1612. 4. 'Hercia Danica,' Copenhagen, 1636.

NANTES, a department in the north-east of France, bounded on the north by that of Morzé, on the north-east and east by that of Bas Rhin, on the south-east and south by that of Vosges, and on the west by that of Meuse. Its form is compact; the greatest length is from east to west, from the department of Bas Rhins to that of Meuse, 70 to 71 miles; its greatest breadth, at right angles to the length, is from the bank of the Moselle, between Pont-a-Mousson and Metz, to the neighbourhood of Mirecourt (Vosges), 46 miles. It area is estimated at 2357 square miles, which is nearly the average extent of the French departments, and rather greater than the conjoint areas of the English counties of Kent and Surrey. The population in 1831 was 415,568, in 1836 it was 424,368, showing an increase of 47,456, or above 11 per cent., and giving 189 inhabitants to a square mile. Both in amount and density of population it considerably exceeds the average of the departments, but falls considerably short of the average density of population in England. Nancy, or Meuse, the capital, is in 49° 51' 16" lat., 6° 11' 13" long., 172 miles in a direct line east of Paris, or 204 miles by the road through Château-Thierry, Châlons-sur-Marne, Vitry-sur-Marne, Bar-le-Duc, and Toul.

The department is hilly, and even mountainous. The principal chain of the Vosges crosses the eastern extremity between Sarrebourg and Phalsbourg; and branches from this mountain chain, of gradually diminishing height, extend over the eastern portion of the department. Near the village of Jocourt the Vosges and the Moselle are intersected by narrow valleys, which frequently present picturesque scenery. Amid the lower slopes are several lakes, as those of Lindre, Stock, &c.; there are also several marshes. The western side of the department is traversed by the hills which separate the east side of the Meuse, and separate it from that of the Moselle. Between these hills and the Vosges is the valley of the Moselle. The Vosges in this department are composed chiefly of the new red or saliferous sandstone and the subjacent secondary beds; and in the rest of the department is occupied by the rocks which intervene between the chalk and the red sandstone. The mineral treasures of the department comprehend freestone for building, and limestone, which are quarried at various places; and the barbeau is quarried near Nancy. Various ores of iron are found, but not in sufficient quantity to make it worth while to extract them. There are two forges for wrought-iron. The most important mineral is rock-salt, of which a vast bed was discovered in 1819, within a mile of the town of Vic on the Seille, at a distance of rather more than 400 feet below the surface. In 1820 about 190 feet lower, five strata of rock-salt were found, having an aggregate thickness of nearly 80 feet, separated from each other by thin strata of gypsum or clay. A sixth stratum has been discovered a few feet below the subjacent, and it has been ascertained that it have a superficial extent of 230 square miles. The salt is pure muriate of soda. The working of the mines commenced in 1823. The cost of raising the salt and breaking it down is very trifling, about 8s. to 8s. 6d. per ton. The department has been known by the name of the &quot;Silver Mountain,&quot; and has been estimated to produce yearly 41,000 to 42,000 tons: the principal springs are in the valley of the Seille at Dieuze, Château Salins, and Moyenwe; there are some in the valley of the Moselle, as at Point-Mousson, and of St Thibal near Nancy. The cost of refining this salt is nearly double that of preparing the rock-salt.

The department belongs almost entirely to the basin of the Moselle: a small portion at the middle extremity, which passes over the principal ridge of the Vosges, as included in the basin of the Rhine, of which indeed that of the Moselle is only a subdivision, and another small portion on the south-western border is included in the basin of the Meuse.

The Moselle enters the department on the south side, a little below the town of Charmes (Vosges), and flows north-west in a rather circuitous channel to Toul; at Toul it turns to the north-east, and flows in a circuitous channel to the junction of its two tributaries, the Seille and the Meuse, by west into the department of Moselle. Its whole course in the department may be estimated at 65 miles, for 18 of which (22 according to the government statement), viz., from the junction of the Meurthe, it is navigable. This portion is divided into two branches in this department, the Meurthe. This stream, which rises in the western slope of the Vosges, several miles south-east of St Dié (Vosges), and has a north-west course, enters this department just below the town of Raon l'Étape (Vosges), and flows west to Luneville, where it receives the Veronzeau on the right bank, and a mile or two lower down, the Mortagne on the left. Below Lunéville the river makes a bend, but after passing the town of Roseières, and receiving the little river Sanon, it resumes its north-western course, and flows past Nancy into the Moselle. Its whole course may be estimated at 75 miles, of which nearly 30 are in this department; the navigation, which commences at Nancy, is of seven miles. It is used for floating timber from the Vosges to Nancy, and for small boats. Mixtures of deals and freewood are sent down by it. It is subject to frequent inundations from the melting of the snow or the falling of heavy rains in the mountains where it rises.

The Madon, another considerable feeder of the Moselle, enters this department from Paris to Nancy, and joins the Moselle above Toul. Its source is in the heights south-west of Epinal (Vosges), and its whole course is about 40 miles, about 16 of which are in this department. It receives the little river Oury. The Math, a small stream, which takes the north-west part of the department, and joins the Moselle just within the border. The Seille, a more considerable stream, waters the northern side of the department, and receives the Verbass and the Petite Seille: it is a small stream, in the adjacent department of Moselle. The Sarre, another small river of importance, which joins the Moselle, rises in the Vosges and waters the east side of the department, a few miles beyond which it becomes navigable. The Zorn, which rises just within the eastern boundary, and waters the south-western border, belongs to the system of the Meuse. There is one navigable canal, that of Les Salines de l'Est (the Eastern Salt-works), 22 to 23 miles long. It commences at the little town of Drucey, on the left bank of the Vosges, about 14 miles north-east of Sarrebourg (Moselle); only a part of it is in this department.

The department has eight Routes Royales, or government roads, the aggregate length of which (on January 1, 1857) was 223 in repair and 36 out of repair. The principal road is that from Toul to Nancy, which enters the department on the west side, and runs from Toul to Nancy, from whence it is continued, first along the valley of the Meurthe to Lunéville, and then along that of the
the Vezouze to Blamont, from which town it runs north-east across the Vosges by Sarrebourg and Phalsbourg into the department of Bas Rhin. Another road branching off from this at Nancy, and rejoining it at Sarrebourg, runs through Château Salins and Moyenven. Roads run from Nancy along the valley of the Moselle, down to Pont-à-Mousson and Metz (Moselle), and upward to Charments and Epinal (Vosges), and across the Moselle and the Meuse to Neufchâteau (Vosges) and Langres (Haute Marne). Roads lead from Blamont to Salins and Baccarat, and thence to Salinlouis mines (Moselle); from Pont-à-Mousson to Commercy (Meuse) and Bar-le-Duc (Meuse), and from Lunéville to St. Die (Vosges) and Colmar (Haut Rhin). The aggregate length of the Roads Department's boundaries (January 1, 1867) about 224 miles, viz. 168 in good repair, 42 out of repair, and 23 unfinished. The by-roads and paths had an aggregate length of 3600 miles.

The climate of the department is colder than the latitude would lead one to expect, the coldness being ascribed to the elevation of the eastern parts, the quantity of woodland, and the extent of water. The air is in most parts tolerably healthy. In the neighbourhood of the Vosges however the habitants of the valleys are very subject to phthisis and phthisic consumption, particularly in the districts, and in others the habitants are afflicted with large goitres, with scurvy or rupture.

About 760,000 acres, half the soil of the department, is under the plough; it is of various degrees of fertility, but the average of the soil is very good, and the best is near the average of France; in wheat, which is the grain chiefly cultivated, the produce is twice the average; and in oats, which are cultivated to nearly or quite the same extent as wheat, the produce is nearly three times the average. In barley the average is 22½ bushels; and in rye, as well as in rye and barley, the average is 4 bushels. The corn is of good quality; and in the western part of the department, where the soil is fertile, the light and airy grain is much cultivated. The meat, and especially the game, is of good quality. As a general rule, the corn is sold for home consumption, and a small quantity is exported. The value of the crops is 70,000,000 francs. The cheese is of good quality, and is sold both at home and abroad. The manufacture of wine is carried on extensively, especially in the departments of Bas Rhin and Vosges, and the wine is exported to all parts of the country.

There are about 180,000 acres of meadow land, and about 15,000 acres of heath or common. The number of horses is about 20,000. The number of oxen is about 2,500,000. The number of sheep is about 2,500,000. The number of pigs is about 2,500,000. The number of poultry is about 2,500,000. The number of bees is about 2,500,000. The number of game is about 2,500,000. The number of fish is about 2,500,000. The number of fowl is about 2,500,000. The number of ducks is about 2,500,000. The number of geese is about 2,500,000. The number of turkeys is about 2,500,000. The number of pigeons is about 2,500,000. The number of hens is about 2,500,000. The number of roosters is about 2,500,000. The number of chickens is about 2,500,000. The number of ducks is about 2,500,000. The number of geese is about 2,500,000. The number of hens is about 2,500,000. The number of roosters is about 2,500,000. The number of chickens is about 2,500,000. The number of ducks is about 2,500,000. The number of geese is about 2,500,000. The number of hens is about 2,500,000. The number of roosters is about 2,500,000. The number of chickens is about 2,500,000. The number of ducks is about 2,500,000. The number of geese is about 2,500,000. The number of hens is about 2,500,000. The number of roosters is about 2,500,000. The number of chickens is about 2,500,000.

The department is divided into five arrondissements, as follows:

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<th>Population</th>
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<td>Nancy, central</td>
<td>551</td>
<td>127,944</td>
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<td>69,810</td>
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<td>Sarrebourg, east</td>
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There are 29 cantons, or districts, each under a justice of the peace.

In the arrondissement of Nancy are—Nancy (pop. in 1831, 29,000 town, 29,783 whole commune); [Nancy]; Rosières (pop. 2463 town, 2507 whole commune), and St. Nicholas (pop. 3006 town, 3043 whole commune) on the Meurthe; Pont-à-Mousson (pop. 3923 town, 7218 whole commune) on the Moselle; Haroué, on the Madon; Vézelise (pop. 1742) on the Oury; and Nobery on the Seille. At Rosières (still distinguished as Rosières aux Salins, though the salt-works from which it derived its name is no longer worked) are the remains of one of the finest of the royal stables in France; there is much meadow land round the town, and many horses are bred. St. Nicholas has a fine old Gothic church, a town-hall, and an extensive market place, or public slaughter-house, lately built. There are mills, moved by water, for spinning cotton and woollen yarn, trimming manufactories, and tan-yards. Pont-à-Mousson is on a slope in the midst of a valley surrounded by fruitful hills. It is divided by the Moselle into two parts, which communicate by a bridge. There are fine good houses in the town, and the streets, which are inconveniently paved with round stones, are tolerably straight. It has a good place or square surrounded by arcades; the town-hall is in this square. The principal church and the church of the parish church of St. Michael are both of the height of the town. The town has two towers resembling crowns; the second has a peristyle overcharged with ornaments. The manufactures of the town are chiefly earthenware, especially artificial stone, much used for water-courses, reservoirs, flat roofs, &c.; and the porcelain is in last place. All the earthenware is exported into the adjacent departments. On an eminence near the town have been found antiquities which show that its summit was antiently occupied by a temple of Jupiter. There was formerly a university at Pont-à-Mousson, founded by Charles III, duke of Lorraine.

In the arrondissement of Château Salins are—Château Salins (pop. in 1831, 2708); in 1836, 2621), on the Petite Bourgogne; Dieuze (pop. in 1831, 2022), on the Meuse; Voutré (pop. in 3119 town, 3186 whole commune), on the Seille; Verjaville, on the Verchamb, and Insming, near the Albe, a feeder of the Sarthe. Château Salins derives its name, and formerly derived its importance, from its brine-springs; but the salt-works have been abandoned, and the brine-springs are dry. Dieuze has two spouting springs near the town; the brine-springs and the salt-works are generally trained as fountains. The stone-fruits are chiefly cultivated, particularly an oval plum of excellent flavour, called the Coëtche, of which great quantities are dried. The speckles of Nancy are in good repute. The quantity of bacon is extraordinary, and the quality is very superior to that of the average of France. The quantity of cheese and butter made in the department is not equal to the consumption. Sheep are not numerous, and are of a large coarse-wooled breed. Horses are numerous but small. The sale of Lorraine had done much to improve the breed by importing stallions from the Levant; they have however been subjected to degeneration. Horses are chiefly used for agricultural labour. Poultry is abundant; but there are few bees. Wolves and foxes live in the woods, and there are also some wild boars, roebucks, and smaller game. Rabits, mice, fieldmice, and moles commit considerable devastations, and caterpillars are numerous and destructive. The department is divided into five arrondissements, as follows:

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leather in considerable quantity made, woolen yarn spun, and common iron goods and hardwoods manufactured. There are manufactories of earthenware and pottery in the neigh-
bourhood. Badonviller has a manufactory of dies and
punches.

In the arrondissement of Sarrebourg are—Sarrebourg (pop. in 1831, 2356 town, 2164 whole commune; in 1836, 2340
commune), Longeville, and Penfarand on or near the Sarre,
and Lixheim and Plaisburg (pop. 1891 town, 3259 whole
commune) amid the steepest slopes of the Vosges. Sarrebourg
existed in the time of the Romans, by whom it was called Pons
Sarowe, or the Sarowe of the Sarmatians. The Sarro-
biens manufacture cottons, paper, cordage, architectural or-
naments, and ornaments for the fitting up of rooms. At
Plaisburg fine liqueurs are prepared. This little town,
which is fortified, and defends one of the defiles of the Vosges,
was built in 1570 by George John, count Palatine of the
Rhine, from whom it obtained its name, which in its Ger-
man form, Pfalzburg, means 'the town of the Palatine.'
The town is supplied with water by a fountain of admirable
construction.

St. Quentin (pop. 1522 village, 1660 whole commune)
and Cirey (pop. 1768 village, 2193 whole commune), though
only villages, require notice for the extensive plate and
other glass works established in them. Coloured glass
and mirrors like those of Nürnberg are made here. St.
Quentin is distinguished by vast forests of birch and
its glass-houses. At Cirey earthenware is manufactured.

In the arrondissement of Toul are—Toul (pop. in 1831,
7309 town, 7304 whole commune; in 1836, 7333 whole
commune) and the Moselle; Veuzy and Triacourt on the Math;
and Coloumbey near the Doubs. Toul existed in the
time of the Romans, by whom it was called Tullum; it
was the capital of the Leuci, a Belgic people. In some
deeds of the time of the Carlovingian princes, it is called Leur-
ce. It is a fortified place, which was twice visited and
invased by the Saxons in the time of Charles the Great. The
Toul is not a place of much trade. There is a manufactury
of earthenware and porcelain, which is noted for its strength
and whiteness, the beauty of its enamel, and the variety of
its colours. There are several markets, and several military
establishments. Wine (of which the surrounding district produces abundance) and brandy are articles of trade.

The population of the above towns, where not otherwise
mentioned, is of the whole commune, and from the census
of 1831:

The manufactures of the department are considerable;
the principal are woolen, linen, and cotton goods; trim-
mings and embroidery; hats, salt, glass, oil, leather, earthen-
ware, cordage, expert work, soap, and some chemical products.
There are bell and type foundries.

The department constitutes the diocese of Nancy, the
bishop of which is a suffragan of the archbishop of Ben-
vene. It is in the jurisdiction of the Court Royal of the
university of that city; and in the third military division, the head-quarters of which is at Metz. It sends six members to the Chamber of Deput-
ies.

In respect of education this department is the eighth in
France. Of every hundred young men enrolled in the
military census of 1828-29, sixty-eight could read and write;
the average of the departments of France being only about
that proportion.

At the time of the Roman conquest, this department formed part of the territories of the Mediomatrici in
the north, and the Leuci in the south. A very small portion of the
province of the Leuci may have been included in the territory of the Tribocii, a Gallic people, who settled on the
left bank of the Rhine. Under the Romans the Medio-
matrici and the Leuci were comprehended in the province
of Belgica Prima, the Triboci in that of Germania Prima or
Sous-Meuse. The Roman or Gallic towns within the limits
of the department were Tullum (Toul), the capital of the
Leuci; Scarpona, another town of the Leuci near which
Jovinus, a Roman general of horse, defeated the Allemani,
A.D. 266, and which sustained a siege against Attilius, now
Scarcone, or Charchegne, near Doulouard, and

and Decem-pagis (now Dieue), and Pons Saravi, now Sarre-
bourg (not Sarrebruck, as some from the name have sup-
posed), two towns of the Mediomatrici. The department
was early comprehended in the conquests of the Franks.
Its subsequent history is given elsewhere. [LORRAINE.
MEUSE, or MAAS. [RHINE.]

MEUSE, a department in the north-eastern part of
France, between the left bank of the Moselle by the Belgian
frontier and the department of Ardennes; on the north-east by the
department of Moselle; on the south-east by that of Meurthe;
and on the south by that of Vosges; on the south-west by that
dept. of Haute-Marne. The department is divided into the
north-west by that of Ardennes. Its form approximates
to that of an oval, having its greatest length, from north by
west to south by east, from the neighbourhood of Mousan
(Ardennes) on the Meuse, to the neighbourhood of Goodre-
court or the Orne, 43 miles, and its greatest breadth, at
right angles to the length, from the neighbourhood of Revigny
on the Orne, to that of Triacourt (Meurthe) on the Math, 46
miles. Its area is estimated at 2492 square miles, which
is rather below the average area of the French departments,
and rather exceeds the conjoint area of the adjacent English
counties Hants and Berks. The population in 1831
was 314,588; in 1836 it was 317,761; showing an increase
in five years of 3131, or about 1 per cent., and giving 132
inhabitants to a square mile. Both in amount and density of
population, this department is below the supply of the French
departments, and still farther below the English counties with which we have compared it.

Bar-le-Duc, the capital, is on the Orne, in 46° 46' N.
lat. and 5° 32' W. long. 126 miles east of Paris, and 132
miles by the road through Epervay, Châtillon, and
Vitry-sur-Marne.

The department is traversed in the direction of its length by the two ranges of hills which enclose between them the broad valley of the Meuse. The first of these ranges separates the basin of the Meuse from that of the
Scine; and is known in one part by the name of ' the heights of Argonne.' A range of hills branches off from these in the south part of the department, and runs north-
west by the country of the river Meuse, and of the town
of Aire from that of the Orne. The height of the east
of the valley of the Meuse separate it from the basin of
the Moselle.

The department belongs to the district occupied by the
hills which intervene between the chalk and the new red
or silaceous sandstone. There are numerous iron mines
in the hills, also quarries of excellent freestone, and vast slate-
 quarries. Potters' earth and marl are dug; and the strata of clay and marl afford very curious fossils, curly and
very fine, and the loam in thirty-six iron-works in the department, chiefly in the
southern part. There were in these establishments twenty-
eight furnaces for smelting the ore and making pig-iron;
and sixty-seven forges for the production of wrought-iron.
There is a manufactury of cordage, and a distillery, and
several manufacturies of the department afford great facilities for procuring it in the iron-works of Abainville near Commercy coal is used.

The central valley which traverses the department in the
direction of its length, and the north-eastern portion of the
department, belong to the basin of the Meuse; which river
covers the department about 38 miles from its sources and
flows north-north-west through the central valley 95 to 160
miles, past Commercy, St. Mihiel, Verdun, Dain,
and Stenay, into the department of Ardennes. The naviga-
commentes commence at Verdun. The Meuse is one of the tributaries in this department. The Othain and the Loue
(with its feeder the Tinte), which water the north-eastern parts, fall into the Chiers, a tributary which flows across the
northern limit of this department and joins the Meuse in
the adjacent department of Ardennes.

The eastern side of the department belongs to the basin of
the Meuse, a subdivision of the great Rhenish basin; and
is watered by the Orne, the Longeau, the Iton, the Math.
and other smaller streams belonging to the system of the
Meuse.

The western side of the department belongs to the basin of
the Seine. The Aire, a tributary of the Aisne, runs in the
Chiers, a tributary which flows across the north-eastern limit of this department and joins the Meuse in
the adjacent department of Ardennes. The Aisne itself has its sources and a small part of its course in the department.
The Orne, or, as it is called in the lower part of its course, the
Orne, enters the department on the south and flows north-

The department is divided into four arrondissements as follows:

<table>
<thead>
<tr>
<th>Arrondissement</th>
<th>Area in sq. M.</th>
<th>Population in 1831</th>
<th>Population in 1836</th>
<th>Number of Communes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bar-le-Duc</td>
<td>369</td>
<td>82,134</td>
<td>86,052</td>
<td>128</td>
</tr>
<tr>
<td>Commercy</td>
<td>725</td>
<td>84,150</td>
<td>86,332</td>
<td>133</td>
</tr>
<tr>
<td>Montmédy</td>
<td>498</td>
<td>68,947</td>
<td>68,403</td>
<td>131</td>
</tr>
<tr>
<td>Verdun</td>
<td>590</td>
<td>80,897</td>
<td>82,241</td>
<td>149</td>
</tr>
</tbody>
</table>

It is subdivided into 28 cantons, or districts, each under a justice of the peace.

In the arrondissement of Bar-le-Duc are—Bar-le-Duc (pop. in 1831, 12,496) [Bar], Ligny (pop. 3,312), and Revigny (pop. 1,598), on the Orléans; Vaubecourt, on the Aisne; Beaufort, on the Aire; and Ancerville (pop. 2,339) near the south-western boundary of the department. Ligny, distinguished as Ligny-en-Barrois, is a pretty little town, antiently fortified, but the walls are now in ruins. The parish church contains the monument of the Marshal de Luxembourg. The inhabitants spin cotton-yarn and weave cotton goods, and carry on trade in wool and timber.

In the arrondissement of Commercy are—Commercy (pop. in 1831, 3,622; in 1836, 3,716), Maxey, Vaucouleurs (pop. 2,157), Void, Sorey, or Sorey (pop. 1,634), and St. Mihiel (pop. 5,822) in the valley of the Meuse; and Gondrecourt on the Orléans. Void is a pleasant town, and has a large church; it was the seat of a branch of the old Order of the Knights of St. John of Jerusalem. A castle was built here about 1272, near the mouth of the Meuse, surrounded by a thickly wooded district. The streets are remarkably straight. There is a fine range of cavalry barracks, formerly a château built by the Cardinal de Retz. The inhabitants manufacture cotton-yarn and goods; there are also some iron-works. Void is built on the slope of a hill on the bank of the Meuse, and is surrounded by meadows. The inhabitants manufacture stockings, linens, and cotton goods. There are some tanneries. Void is the depot for rape-oil, which is made in the canton. Vaucouleurs, formerly a town of considerable importance, is now a part of the growth of the town of Commercy, and is surrounded by meadows and woods. The inhabitants manufacture cotton goods and fabrics, and carry on trade in wool, flax, and hemp. The town is remarkable for its size, that on capturing it the castle was built. The situation of the town is very picturesque, but the houses are old. There was an antient Benedictine abbey, the foundations of which gave rise to the town. The parish church, formerly a conventual, contains the remains of several princes of the house of Lorraine and counts of Bar. Another church, that of St. Etienne (St. Stephen), is adorned with a fine piece of sculpture, a 'boly sepeulchre' carved out of a single block of fine white stone, built by Simon Richer, the last abbot of the Abbey of St. Remi, of France, and a pupil of Michael Angelo. There are at St. Mihiel cotton and woolen cloth manufactures, oil-presses, and tan-yards. The inhabitants trade in corn and wine; there are three yearly fairs. There are a subordinate court of justice and a sub-priorate; there are also government offices; a high school, and a public library. There is a camp, supposed to have been occupied by Julius Caesar, near the town.

In the arrondissement of Montmédy are—Montmédy (pop. in 1831, 2195; in 1836, 2201) on the Chiers; Marville on the Othain; Jamet on the Loison; Danvilliers on the Tinte; and Dun et Stenay (pop. 2,681 town, 3,140 whole commune) on the Meuse. Montmédy is an ill built town, but is of some consequence as a fortress. In 1816, being defended by about 100 soldiers of the line, and some national guards and custom-house officers, making in all 500 men, it resisted the attempt of a corps of 1,000 Prussians to surprise it; the assailants lost 500 men. The inhabitants manufacture leather and hay. The iron- and oil-mills. Stenay is a pleasant situation, and was formerly a place of strength, but was dismantled, a.d. 1564, by Louis XIV. There are barracks. There is in the town an extensive co-operative, in which the manufacture of flax is employed. There are considerable iron-works near Stenay. In the village of Avioth near Montmédy is an antient church accounted one of the finest specimens of Gothic architecture in France.

In the arrondissement of Verdun are—Verdun (pop. in 1831, 9798; in 1836, 10,577) [Verdun], in the valley of the Meuse; Clermont-en-Ardenne [Clermont] and Varennes (pop. 1632), on the Aire; Rtain (pop. 3034), on the Ornes; and Fresnes, on the Longuen. Verdun was the place where Louis XVI. and his family were stopped in their at-
MEX

180

MEX

tempt to escape from France. There is a glass-house in the town. Erain or Estain is a tolerably neat town in a marshy plain. The inhabitants manufacture muslin cloth, fetid leather, and paper. This town gave title to the French admiral Count d'Estaing.
The chief manufactures of the department are iron goods, glass bottles, paper, enamels, leather; cotton hemp, and cotton woolen fabrics; and wickerwork. There are brandy distilleries and oil presses. The chief trade is in agricultural produce, corn, wine, oil, timber, &c., and in iron.
The department forms the bishopric of Verdun, the bishop of which is a suffragan of the archbishop of Besançon. It is in the jurisdiction of the Cour Royale and the circuit of the Académie Universitaire of Nancy; and in the second military division, of which the head-quarters are at Châlons. It sends four members to the Chamber of Deputies.

In respect of education this department is in advance of every other in France. Of every hundred young men enrolled in the military census of 1820-29, seventy-four could read and write; while the average of the departments was under forty.
The department antiently formed part of the territories of the Verdonenses and of the Leuci; small portions of it were comprised in the territory of the Remi, the Correns, the Remi, and the Treviri or Treviri: all these were Belgian nations. In the Roman division of Gaul the Remi were included in the province of Belgica Secunda; the other nations in Belgica Prima. Verdonum (or, as it is written in the previous chapter, Verdonum, Verdonia, Verocone, Verduinensis) was a Roman colony. Verdonenses, was the modern Verdun; Baslum, a town of the Leuci, was the modern Naix or Naïs, a village on the Orne above Ligny; and Caturigis was in the vicinity of Bar-le-Duc. On the overthrow of the Western empire, the department included part of the land of the Remi and the Correns, and consequently, in part successively of the kingdoms of Austrasia and Lotharingia or Loironne. The greater part of it was comprised in the Percy of Lorraine and Bar; and the remainder in the bishopric of Verdun, one of Trois-Erêches (the department); or in the county of Champagne and the county of Clermont.

MEW, a name for the Gulf. [Laride.] In falconry it signifies the places where hawks are kept.

MEXICAN STATES, THE UNITED, a federal republic in America, occupy the north-western and by far the greatest part of the Mexican isthmus, together with the south-western portion of the main body of North America: they lie between 15° and 42° N. lat. and 87° and 119° W. long. They are washed by the Gulf of Mexico and the Bay of Honduras, a division of the Caribbean Sea; and on the south-west and west by the Pacific, which here forms the long Gulf of California. On the south-east it borders on Guatemala, one of the states of Central America, washed by the Sea of Cortez, and on the north-east and north it is bounded by the states and territories of the United States of North America. The boundary-line on this side, according to a treaty, begins on the east at the mouth of the river Sabino, and follows its course northward to the point where it is intersected by 32° N. lat.; it then continues along the meridian of 94° until it reaches Red River. The line ascends the last-mentioned river to the point where it passes the meridian of 100°, and proceeds along this meridian northward to the Arkansas river, which constitutes the boundary-line westward to its source in the Rocky Mountains. From this range westward to the shores of the Pacific, the parallel of 42° separates the territories of both republics. As large tracts of the United States are described both as unknown, the area of this extensive country can only be approximated to. It probably occupies a surface of about 1,500,000 square miles, or more than seven times the area of France.

Surface: Soil; Climate; Rivers. This immense country is divided into three regions, of which two are marked by different features. The first comprehends the countries lying to the east of the isthmus of Tehuantepec, which is crossed by the meridian of 95° west of Greenwich with the Eastern Region. It is bounded on the south by the meridian of 95° in a curved line to the mouth of the Rio del Norte on the east (25° N. lat.), and to the most northern reefs of the Gulf of California (32° N. lat.) on the west; it is the Central Region, or Anahuac. The third or Northern Region comprehends the countries situated north of a line drawn from the mouth of the Rio del Norte to that of the Rio Hondo.

The Eastern Region comprehends the peninsula of Yucatan, the western declivity of the table-land of Guatemale, the plain of Tabasco, and the isthmus of Tehuantepec. The north-eastern extremity of the peninsula of Yucatan, called the Gulf of Honduras, is washed by the Caribbean Sea and by the Gulf of Mexico. The second easternmost point, or the mouth of the Rio del Norte, is Cape S. Antonio, the most western extremity of the island of Cuba. Through the strait formed by these bays there is a current with considerable velocity set to the north. The earthy particles brought by this current are thrown on the southern shores of the peninsula, where the current is much less rapid. The shores have no harbours, but only roadsteads, which during the northern gales are very unsafe; but along the eastern shores there are several harbours. The shores are sandy and flat. The level country extends, and it is a large expanse inland, whilst the centre of the peninsula is occupied by a range of low hills, or rather a long and comparatively narrow table-land enclosed by two ranges of low hills. The country along the Bay of Honduras is well watered, and exhibits a vigorous vegetation, both in its trees, which are of heavy growth, and in the great variety of its plants; but the soil is nearly uncelculated, the scanty population being chiefly employed in cutting mahogany, with bitus and seavees. The interior is crossed by numerous rivers, and, as the flat country on the northern coast, has a sandy beach and no spring-water is found from Cape Cachette to the mouth of Rio de S Francisco, which empties itself into Campechoy Bay; and even as far south as the Laguna de Tampico, which is 45° W. lat. In the central and eastern parts of the trees are stunted, and the plants of a languid growth, except during the rainy season (from May to September), when the climate, though exceedingly hot, is very healthy, though not much better inhabited and cultivated than the eastern part. The rest of the peninsula is mountainous, and is more or less covered with forests; and on the plains the climate is very unhealthy from the beginning of the rainy season. The climate along the coast is generally healthy, and its productions vary according to the different elevations of the surface. In some the productions are excellent; in others of inferior quality; and in others no plants are grown.

The plan of Tabasco begins on the east, at some distance east of the lagune of Termidos, and extends westward to Cape Partida Rock, a moderately elevated cape, in which a range of hills, including the volcano of Tula, terminates (32° W. long.) on the shores of the Gulf of Mexico. This cape is more than 250 miles long, and extends inland from 20 to 120 miles. Its surface is a dead level, and the soil is clay. Being very fertile, it is covered with a thick forest of heavy growth, but is little cultivated on account of its being subject to inundations, and generally under water for several months during the rainy season. It seems that the west part of the Mexican States suffers very much from the superabundance of rain. In this case, the Mexican States, both by circumstance, and to the great heat of the summer, the unhealthiness of this tract is to be attributed. Besides the common objects of agriculture in countries similarly circumstanced, as maize, plantains, and manioc, it produces in larger quantities, the bean, and the yam; the indigo is stated to be common in the woods. Though the coast is generally low, parts of it are higher than any other portion of the coast of the American continent along the whole shore of the Gulf of Mexico. The second easternmost point, or the mouth of Tabasco river, are the heights of S. Gabriel, a range of hills running east and west about 30 miles, at a short distance from the shore; and where the plain terminates on the west is Cape Partida Rock, the extremity of a somewhat elevated and rocky shore, which extends
about 30 miles south-east and north-north-west. The Laguna de Terrenos is about 60 miles long from north-east to south-west, and 30 miles wide on an average; but in many places it has hardly four feet of water, and the three or four channels by which it is connected with the gulf are hardly navigable for large boats. The water is brackish. The plain of Tabasco is watered by a considerable river, the Rio de Tabasco, and its two branches the Usuaminta and the Grijalva, of which the former rises in the highlands of Guatemala and Ecuador, and flowing in a direction generally north by west, forms a considerable cañada south of 17° N. lat., where it descends from the table-land. Above this water-fall it is navigable for canoes, and below it for larger boats. The Grijalva, a few stunted streams, rises in the hills on which the ruins of Palenque, the most northern outskirts of the table-land of Guatemala. The Usuaminta joins the Rio de Tabasco a few miles above its mouth, after a course of more than 300 miles. The other branch, the Grijalva river, rises in the range of high hills in Guatemala, between the towns of Tumiacapán and Gu zuequetango, and runs with many bends in a wide valley in a north-west direction, until it issues from it near the isthmus of Tehuantepac, where it turns to the north-east by north, where the depth of water increases. It traverses the whole plain in a rather oblique direction, and appears to be navigable in this part for boats of considerable burden. Before it joins the Usuaminta it is navigable for canoes for 50 or 60 miles from Villa Hermosa. After having joined the Usuaminta, it falls into the Gulf of Mexico at Port Victoria, after a course of about 350 miles. The plain of Tabasco occupies the northern portion and about a quarter of the southern part of the Yucatan Peninsula. The southern half comprehends a mountain-ridge and a smaller plain. The most western declivity of the table-land of Guatemala assumes the form of a ridge at about 94° W. long., which, running due east and west, connects the last-mentioned table-land with the eastern. This ridge (or rather these ridges, for there are several, running nearly parallel to one another) occupies between 35 and 40 miles of the isthmus. It is called Cerro Pelado, and probably does not rise above 2000 feet. Being entirely covered with green growth, it is capable of producing several tropical plants. It is supposed that an easy line of communication may be established across the isthmus of Tehuantepac, between the Gulf of Mexico and the Pacific, as the Cerro Pelado is in part watered by the waters of the Chagres and is in part watered by the Chagres and is navigable by several boats. The river Chimalapa, descending from the Cerro Pelado, traverses the plain of Tehuantepac; and though its whole course perhaps does not exceed 50 or 60 miles, it has much water and is navigable to S. Miguel de Chimalapa, a distance of about 30 miles.

On the same Cerro, but within the northern ridges, rises the Rio Huasacualco, which first turns to the west, and then to the north, breaking through some of the ridges of the Cerro Pelado. In this part of the course it is joined by several small rivers, which descend from the western declivity of the table-land of Mixtecapán, and it soon becomes a powerful river, though it is not navigable on account of rapids or cataracts. As soon as it enters the plain of Tabasco, its course is gentle, and there is no further obstruction to the navigation. Its mouth, which is situated in the south-western recess of the Gulf of Mexico, is however so choked by a bar and shoals, that vessels even of small size cannot enter it.

The Central Mexican States may be called Anahuac, though this name was used before the Spanish conquest to designate only the country as far north as 21° N. lat. and did not comprehend the northern district which we include in this region. In its natural features it exhibits great variety.

We begin our survey with the eastern coast, which is low and sandy from the Punta de Rroco Patla (18° 40' N. lat.) to the most north-eastern corner of the Gulf of Mexico (about 25° N. lat. and 98° W. long.), but only as far as the coast line, without being broken by inlets or bays; and consequently it contains no harbours except those formed by the mouths of the rivers; and even these are only unsafe roadsteads, as the rivers of this coast (between 18° 40' and 22° N. lat.), with the exception of the Rio Alvarado, have only water enough in the rainy season. North of 22° several rivers are found on the coast line; but they are not long, and mouths the coast cannot be approached by vessels, as it is lined by long, low, and narrow islands, which lie parallel to, and from two to six miles from it. The channels in which these sand bars are separated are too shallow to admit even boats. The coast between 17° and 19° is a sandy coast, from three to ten miles inland, is very low, but is defended from the sea by sand-hills rising from 50 to 200 feet high. The soil is sandy and destitute of vegetation, with the exception of small crops of cotton and hemp. At the back of this low sandy tract the country rises gradually to the foot of an extremely steep ascent, which constitutes the eastern edge of the extensive table-land farther west. The country which lies between the shores and the steep ascent varies in width. At Vera Cruz (near 19° N. lat.) it is about 60 miles wide, and this may be considered as its average breadth south of 22°. Farther north it widens, and at Saltillo (26° N. lat.) it is more than 180 miles across. Its acclivity can only be called gradual in comparison with the mountain lands which lie to the north of it, for, and maintains an elevation of 2500 or 3000 feet at a distance of only 50 miles from the sea. In the wider portion of this tract, north of 22° N. lat., a small number of isolated hills, generally about 1000 or 1200 feet high, are scattered over the inclined plain; those north of Monterey are the highest, and are visible at a great distance.

This tract is comprehended in the Tierras Calientes, or hot countries. The seasons are divided into the winter, or the season of the dry fields, and the summer, or season of the breezes. The former extends from January to April, during which time the north winds (los nortes) are prevalent, and frequently blow with the force of a hurricane, sometimes for many days. They are the terror of navigators on these shores. During these season the country is healthy, and the vomito prieto, or yellow fever, ceases. The mean heat of this season is 71° of Fahrenheit, but whilst the north winds are blowing the thermometer sometimes descends to 60°. Rain is not rare during this season, but very short and dry. During the summer the heat is very great; the mean temperature is about 81°, and in July and August is about 82°. The rains are not heavy before June, but in that month they descend in torrents nearly every day for several hours. In July alone there falls about fifteen inches, and the crops throughout the whole country are destroyed. The principal annual quantity at London. In this season, especially towards the end of it, in September and October, the vomito prieto is prevalent, and very destructive among the white inhabitants. This season, however, only occurs in the south part of the country: places which are distant from the town of 2500 feet are entirely free from it. The mean annual heat of this tract is 77°. It is extremely well adapted for the cultivation of all tropical products, and as its soil, with the exception of the elevated plains, is possessed of a considerable degree of fertility, it produces rich crops of Indian corn and rice where it can be irrigated. Bananas, pine-apples, oranges, and manioc are also cultivated. The products adapted for exportation are chiefly coffee, sugar, and cocoa, and a small quantity of cotton. Chilas and yam are collected in the woods, with which a great part of this region, especially that near the steep ascent, is thickly covered.

The steep ascent which bounds this tract on the west rises in some places in terraces, which lie between the declivities of the ascent, and are the receptacle of the water of the rains; and are thus rendered navigable for carriages, namely, at Xalapa, near Vera Cruz (19° N. lat.), and at San Júan, west of Monterey (26° N. lat.), though its whole length probably does not fall short of 600 miles. The rocks are generally too steep to maintain any vegetation beyond a small growth of grass on the top, where it intercepts the acclivity a vigorous vegetation is found; in the lower part there are many oak-trees, and in the higher large pines.

The steep ascent just described constitutes the outer edge of the extensive plain of Anahuac, which extend westward to a great distance. The edge itself is lined by a continuous
series of hills rising in general only to a moderate elevation above the table-lands, but some of them attain a great height, as the Cerro de Perote, near the road leading from Vera Cruz to Mexico, which is 13,415 feet above the sea-level, and 5723 feet above its base, and the peak of Orizaba, which attains a height of 17,773 feet. The highest part of the Gulf plain of the table-land do not form a continuous chain, but appear rather isolated in the southern districts. North of 22° N. lat. however they constitute a continuous range of high mountains, with a height between 15° and 20° N. lat. almost entirely to the sea; and this chain extends to the north of the Real de Catorce (24° lat.). North of the group which surrounds this place they again sink down nearly to the level of the table-lands.

The isolated plains of Anahuc are divided into two parts by a range of mountains, which traverses them in a general eastern and western direction, and is called Sierra Madre. This chain begins not far from the eastern edge, near 21° N. lat., west of Tizcuacu, with the mountains of La Encarnacion, whence it continues in a west by north direction to San Felipe (21° 40' N. lat.), which town is situated in a comparatively small plain enclosed by two branches of the range. Here an elevated and wide offset branches off to the southward, and stretches over the plain for about 200 miles, terminating with the group in which the mines of Guanajuato are.

West of San Felipe the range declines to the north-north-west, and its continuity seems to be broken into isolated ridges, such as the Altabrera, the Altagracia, the Anguas Calientes, and the group of mountains which contain the mines of Zacatecas. But at no great distance west of Zacatecas the Sierra Madre re-appears in the decided shape of a mountain-range, and occupies a width of a hundred miles, with its base. Its direction is north-west as far north as 28° N. lat., where it declines to the north, and terminates near 32° N. lat., in an isolated mountain-group called the Sierra de la Esquela, having gradually diminished both in elevation and width. The elevation is almost 10,000 feet above the sea; the mountains of La Encarnacion rise more than 10,000 feet above the sea, and about 4000 above their base; those enclosing the plain of San Felipe are probably as high, especially those of La Palma. It would also seem that the range stretching north-west from Zacatecas is not less elevated for a considerable extent, though it sinks lower north of 28° N. latitude.

The elevated plains which spread out west of the steep ascending part form a large part of the surface of Mexico. They are widest between 19° and 20° N. lat., where they occupy 200 miles from east to west. This extensive tract of country however is not one plot, but divided into four plains, unequal in extent, and separated from each other by ranges of mountains which rise from 4000 to 5000 feet above the sea. The most eastern plain may be called the plain of Tisacala, from the town of that name, which is situated nearly in its centre. Its surface is from 7000 to 7500 feet above the sea, and it occupies the space between 23° and 98° W. long., and between 18° and 20° N. lat. Its surface is pretty level: the hills, which occur on it at considerable distances from one another, rise only to a very moderate height, and the depressions are few and of small extent. Two isolated peaks of considerable elevation, the Cerro de Peñamor and Mount Malinche, are near the road which leads from the sea to Mexico. The parts of this plain which are contiguous to the eastern edge of the table-land are very strongly bound together by ranges covered with dense forest, and the surface covered with thick vegetation, only a coarse grass, on which sheep pasture. This is part of the so-called district, called el mal pais, occupies about one-third of the plain. Farther west the soil improves, and in many places the ground is covered with maize, wheat, and barley, or laid out in plantations of potatoes, which divide the plain of Tisacala from that of Tepotzotlan, contain the peak of Ixtapaccihuitl (15,704 feet above the sea), and the volcano of Popocatepetl (17,884 feet), which last is the highest mountain in Mexico. The plain of Tepotzotlan, west of this, is called the plateau de Tepotzotlan, and is about 19° and 20° N. lat. and 98° 30' and 99° 30' W. long., and about 7480 feet above the sea. Farther west is the plain of Toluca, which extends to 100° W. long., and is somewhat surrounded by the Sierra Madre, but is broad and surrounded by chains of hills. In the southern chain is the Nevada de Toluca, which is 15,160 feet above the sea, and through the northern chain the Rio de Lerma forces its course. The surface of this plain is in many places uneven and broken, but it contains also extensive levels. As it is nearly 9000 feet above the sea-level, it is too cold to produce wheat, and it serves chiefly as pasture-ground. The most western of these extensive plains is that of Mixteco, which lies between 19° and 20° W. long., and approaches the Pacific within about 30 miles. Its surface in the eastern districts is about 6500 feet high, but towards the west it sinks down to 5500 feet.

The region is very fertile, and produces abundantly every kind of grain, and the elevation above the sea enables it to admit the cultivation of tropical products. Nearly in the centre of this plain is the lake of Patzcuaro, famous in the history of the ancient kingdom of Michoacan, whose capital, Tainatontan, was built on its banks. Towards the western extremity of the plain is the peak of Tancitaro, which is probably more than 10,000 feet above the sea.

From the western edge of the table-land of Michoacan, on which the small town of Zapotlan is built, the country descends rapidly, and in the plains of Colima rises to a great height. This country is very fertile, and is considered as producing all the tropical plants; but is badly cultivated.

On the north the table-lands just mentioned border on others of a similar description. On the south the country descends rapidly and with a very irregular surface, except where it is broken by a soil, a range of limestone hills, and sometimes a river resembling in most respects the low tract along the Gulf of Mexico. It appears to be generally level and not much elevated above the sea. On this plain the isolated volcano of Colima rises to a great height. This country is fertile, and is considered as producing all the tropical plants; but is badly cultivated.

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country, and are called mesas (table-land). The descent terminates about the meridian of Zapotlan, or Zapotlanfajo (102° 30'), where the productions of the terrains calientes appear, and the general level of the country extending to the shores of the Pacific may be estimated at about 4000 feet above sea level. The river called Malacatoc, Plain of Xalseo, cannot be called a table-land, as its surface is too uniform and by being in many places intersected with hills, frequently rising to a great height, with a steep ascent, though flat tracts of great extent are numerous, among which that called the valley of Tepeaca is the most fertile. Though this region, as being among the terrains calientes, might produce most tropical plants, Indian corn and wheat constitute the principal articles of agriculture. The extent to which wheat is grown shows that the greatest part of this region could be devoted to it. In this country is the lake of Chapalpa, which is about 90 miles in length, and from 12 to 18 miles in breadth; the surrounding hills rise to a considerable elevation, and descend rapidly to the water's edge. The lake contains the island of Mesquila, on which a number of Indians resisted the arms of the Spaniards from 1811 to 1814. The lake is noted for a kind of fish called pecesado blanco, which occurs in most of the lakes of the table-lands, but nowhere attains the size of the land of Pescado Blanco, in the island of Guadalaxaro, whence it is sent to Mexico, slightly sprinkled with salt or preserved in snow.

The Rio Santiago, or Rio Grande, the largest of the rivers of the Sierra Madre Occidental, traverses the region just mentioned, and forms a natural boundary with the table-land of Tezontlatlan, and separates the provinces of rural, lowland and level tracts of considerable extent and great fertility. This region contains numerous productive mines. The western and greater portion of the table-land (between 106° and 107° W. long.) is nearly a plain, rarely interrupted by hills. Its surface is nearly level, and productive. It is the richest part of the eastern portion. The central part of it is occupied by one of the richest agricultural districts on the Mexican isthmus, known under the name of Baxio, which extends from the seaport of Queretaro along the Rio Santiago, and forms a general chain of posts west of Salamanca, and thence in a northern direction to Leon. It extends about 100 miles, and its average width probably 30 miles. It is covered with corn-fields, which, being irrigated by canals, yield rich crops of Indian corn, wheat and barley. In the other districts many sterile tracts occur, which are either covered with stones, and then called pedregal, or with lava, in which latter case they always receive in Mexico the name of mal peta. The remainder is rather fertile, but cannot be cultivated. The province, therefore, is not far from being abundant in this region. Where a depression occurs in which the rain-water accumulates, a stone wall is generally erected to prevent it from running off, and the artificial pond or tank so made is called presa. By far the greater part of the country however cannot be irrigated at all, and is used only as pasture-ground. Some of the cattle estates are of immense extent, and keep many hundred thousand head of cattle and sheep. On this table-land the barrancas are more frequent and indeed occur in other parts of the isthmus of Mexico, but not in such number nor of such dimensions. A barranca is a depression in the level country, having always a steep declivity, and descending frequently 1000 feet below the general surface of the country. Sometimes it passes in a straight line for many miles wide, and still longer: they are covered with trees of a vigorous growth, which form a striking contrast with the bare surface of the table-land. The climate of these barrancas is considerably milder than that of the country about them. Much of the land is covered with pastures, and the interior is well watered by natural springs and canals. Vegetation follows the course of a small stream which runs in the centre of the barranca. Several small towns are built in these depressions of the table-land.

It is hardly possible to determine the western boundary of the plains of Queretaro, as it is not marked by a continuous ridge of hills. From about 108° 30' W. long. and from that point where the Sierra Madre turns northward, the country descends very gradually to the west, but with a broken surface, so as to present a succession of hills and valleys, and the plains in some places occupy the summit of the higher

P. C., No. 931.
below Panuco is exceedingly windless. It traverses a low and frequently swampy tract, covered with extensive forests, in which mahogany and different kinds of dye-wood are cut. At its mouth the river forms the harbour of Tampico. Its whole course, including the windings, can hardly be less than 400 miles.

The climate of these table-lands varies in proportion to their elevation above the sea. In those of Teneochitlan and Tiscolas, which are nearly equal in this respect, the mean annual temperature is 62°. In winter the thermometer generally varies between 45° and 47° and sometimes, though rarely, descends below 32°. In summer it never exceeds 75° in the shade. On the table-land of Toluca, which is the most elevated, the air is so cold during the greatest part of the day, that the thermometer generally varies between 38° and 40°, and even persons who have been brought up in northern regions find the climate very unpleasant. On the table-land of Valladolid, Mixtacapan, and Michoacan, which are considerably lower than Teneochitlan, the mean annual temperature probably varies between 70° and 68°, a plant being more than 5000 feet above the sea-level, are called by the inhabitants Tierras Frías (cold countries). The winter is indeed not severe, but the summers are not warm. To the small difference of the temperature in the different parts of the table-lands, another and perhaps the best in some respects, is to be attributed the fact that several plants do not grow in these countries, which thrive very well without the tropics and in places the mean annual temperature of which is considerably below that of the table-lands.

The rains on the table-lands are only two, that of the rains (estacion de las aguas) and the dry season, or summer (el estio). The rains commence in June or July, and terminate in September or October; the rainy season consequently lasts only four months. The rains occur earliest and are most plentiful on the eastern shores, and extend afterwards farther west. They are accompanied by thunderstorms, which are experienced successively at Mexico, Guadalaxara, and on the western shores. We are not acquainted with the quantity of rain which falls in any part of the table-lands; but it is probably much less than that which falls on the low shores of the adjacent seas. The greatest quantity appears to fall along the range of the Sierra Madre and its branches. It would also seem that the table-lands which approach the Pacific nearer are abut more than those lying near the Gulf of Mexico. The table-land of Mixtacapan seems particularly favoured in this respect, as the rains begin in the month of May, and always continue to October; they are also more abundant. Though the rains are much less abundant in the table-lands than along the coasts, they may be sufficient to maintain a vigorous vegetation, but for the rapid evaporation. To this must be added the peculiar nature of the soil, which covers rocks of a porous nature, by which the moisture is absorbed and carried too far below the surface of the earth to impede its evaporation. The most sufficient artiﬁcial cultivation of grain where it can be watered, and even many of the rivers disappear in ﬂowery rocks. The plants are entirely destitute of trees, but are covered with several kinds of herbs, which grow best on an arid soil, and endures a considerable degree of cold. Forests of trees occur only on the hills and short ranges, which in several places are dispersed over the plains, and especially on their western sides. The hills and western declivities are covered with bare rocks. For want of the means of irrigation, perhaps one-tenth of the table-lands are only used as pasture, and the grass is sufficient for that purpose to the months of March and April, when the south east wind, called viento de la Mas- tea, begins to prevail, which, being hot, dries the smaller plants and grass. In this part of the year the country is of a very dismal aspect, and the cattle suffer much where there are no pasture grounds that can be irrigated, until the beginning of the rainy season, which comes towards the end of May.

The elevated table-lands of Mexico, like those of Tibet and Central Asia, which are still more arid, have also a large portion of their surface covered with murtae of soda and other saline substances, in the dry season, which is a hot season, which considerably diminishes the powers of the soil.

The countries which are elevated from 2500 to 4000 feet above the sea-level, such as the broken region lying between the table-lands of Teneochitlan, and Toluca and Michoacan on one side, and between the table land of Mixtacapan on the other, and the uneven plain of Xalisco, are called Tierras Templadas. Their mean annual temperature amounts to between 75° and 78°, and they enjoy nearly a continual spring, as the difference of the temperature in the colder and hotter seasons does not exceed 5°, or at the utmost 10°. These tracts produce, besides the whole fruits and the table lands has an almost vegetative state, and, as well as the table lands themselves, enjoy a very healthy climate all the year round, whilst the inhabitants of the low tracts along the coast are subject to dangerous diseases.

We pass to the countries lying to the north and east of the Sierra Madre. The country, which is bordered by the range on the south and west, is a plain of great length, terminating on the north on the banks of the Rio del Norte, between 30° and 32° N. lat., and at the Sierra de las Espadas, the most northern extent of the Sierra Madre, is nearly 700 miles. Its width, which between 22° and 24° N. lat. hardly exceeds 100 miles, widens considerably farther north, so that at 29° N. lat. it is probably more than 300 miles. The southern portion of this plain, as far north as a line drawn from Zacatecas to the west to Cañon de la on the east, may be on an average about 6000 feet above the sea-level. Its surface is in many places traversed by ranges of hills, running east and west, and its soil in general is not so fertile as the table lands. Quarternary plains, which it in fertility, a great portion of it is being covered with sand, and other parts with stones. Some districts, being possessed of the means of irrigating the land, are distinguished by fertility, as the country about S. Luis de Potoló, and the Valley of the Rio Grande de las Nieves, which lies on the banks of the river, is tributary of the Rio Panuco. A great portion of the country serves as pasture-ground for numerous herds of cattle, sheep, and goats. The rains are less abundant than farther south, and fall mostly in October and November; the heat is summer is more severe, and the cold in winter greater than on the table-land of Queretaro.

The northern portion of the plain is still less favoured by nature. Near a line drawn from Zacatecas to Catorce it is about 6000 feet above the sea-level, but in the neighborhood of the river the soil is very fertile. On the north and south sides there are fertile valleys, in which a few settlements, and on the west side the banks of the river are productive of rice. It suffers greatly from the scarcity of rain, which in the southern districts is far from being abundant, and not of 25° N. lat. is very rare. It is consequently badly supplied with water, the springs being few in number, and the river less a river and more a stream of sand. The great scarcity is principally owing to the soil, which contains a great portion of carbonate of soda. The plain contains numerous dry salt-lakes, whence large quantities of carbonate of soda are collected and taken to different parts of the country and sold for a large profit. The sand at the coast, though not sufficient to maintain a vigorous vegetation, but for the rapid evaporation. To this must be added the peculiar nature of the soil, which covers rocks of a porous nature, by which the moisture is absorbed and carried too far below the surface of the earth to impede its evaporation.
tribe of natives, called the Apaches, and has never been examined by European travellers, but it is said to contain an abundance of metals, which have never been worked.

The Sierra Madre, which extends along the western side of this plateau in a north-western direction, lowers towards it with a gradual descent, and is probably, in terraces, separated from each other by abrupt declivities, and traversed by deep and steep transverse valleys. The crest of the chain is situated towards its western declivity, and between the roads of the mines in the bases of the longitudinal valleys, narrow, but of considerable extent, which contain rich mines. Towards the plains, which lie along the Pacific, the descent is very rapid, and only furrowed by ravines.

The Sierra Madre is naturally divided into two regions, the plains of Cinaloa and the hilly region of Sonora. The former extends between 24° and 25° N. lat., and the latter between 30° and 33° N. lat. The plains are perfectly level, and only hills of moderate elevation divide them from the Sierra Madre. Their soil consists of a sandy clay, almost without a pebble, which is fertile wherever it is irrigated; but as this country has not been in possession of the Spaniards much more than a century, agriculture has not yet made any great improvement, which does not begin until the 24th of June, and lasts about two months. The greatest heat is experienced before the rains, from the month of March, when the country is parched up and resembles a desert. The rivers running across the plain flow in beds considerable, but small, and in summer, when the largest rivers reach the most abundant rains they rise high enough to water the adjacent tracts. The most considerable of these rivers are the Rio de Culican, the Rio del Fuerte, and the Rio Mayo, each of which may run upward of 100 miles in one day or a day and a half. The northern part of the plain seems to be considerably elevated above the sea, as there is a sensible descent some miles in length from it to the low and sandy tracts which skirt the shore.

Sonora, a short distance north of the Rio Mayo, has likewise a tract of level and low land along the sea, but it soon rises to some elevation, and then extends nearly on a level many miles inland. This part of the country is rather sterile, but more from want of moisture than from want of soil, which is well cultivated by the Hidalgos, who are inhabitants of that part of the plain of Cinaloa. The hilly country begins from 30 to 40 miles from the shore, and is traversed by several ridges running south and north, parallel to the Sierra Madre. It is not yet known how they are connected with the principal range of mountains, but their elevation has not been ascertained. Between these hills run rivers in valleys, generally several miles wide, and possessed of a considerable degree of fertility. The largest is the river Yaqui, which is formed by two branches, running through the middle of the Sierra Madre southward, and the Rio Oposura, which runs parallel to it farther west. The first runs about 200 miles, and the second 120 miles, before they unite upon emerging from the hilly region. After their junction they take a curve of 150 miles more, until they fall into the Gulf of California, south of 25° N. lat. The central districts of Sonora are also traversed from north to south by the rivers Aripae and Docono, which flow between the other until they unite a few miles above the town of Pitic at S. Jaunzt; a few miles below Pitic the unite river enters a lake of some extent, which has no communication with the sea. The whole course of this river may be about 200 miles. In the northern portion of the province, the country is uninhabited, but the other changes in temperature which commonly occur in these countries. The thermometer ranges during the year between 30° and 95°. During the northern and north-eastern winds, which blow from the Rocky Mountains, and probably pass over elevated plains, it sometimes freezes every night for several weeks at Pitic (29° N. lat.), and the thermometers then sink as low as 18° in the night-time. It seems that frost occurs in these parts every year. But the summer is excessively hot, and the hot weather continues for several months: the rains take place much later here than farther south.

The principal range of the Rocky Mountains is situated on the Mexican isthmus, which is divided from the main body of North America by a plain extending from the shores of the Pacific eastward to the lower course of the Rio del Norte. This range does not extend far enough to the eastward to be interrupted by two mountain-groups only one of them, the Arizona, is situated near 105° W. long., and noted for the fabulous stories of its great wealth in the precious metals; the other occurs near the bank of the Rio del Norte, and begins to show itself a few miles farther eastward, and is called Sierra del Florido. Nothing is known of these mountain-groups. The plain is drained by the river Gila, which runs more than 500 miles in a western direction, and unites with the Rio Colorado near its embouchure in the Gulf of California. It rises in the Sierra de Mogollon, the most southern extremity of the principal range of the Rocky Mountains; and though it may have a considerable volume of water in its upper course, it loses it imperceptibly by flowing through an arid country. It is noted only for the rains which go on through the whole year, and in which it does not seem to be joined by any tributary of importance. The plain itself is a desert, in which only a few families of the Apaches are found, and a wandering life. An exception however is to be made in favour of the town called Casas Grandes (near 116°) which are found, as such rains generally occur in spots favoured by natural fertility.

The Mexican States extend much beyond this natural division, and contains the following mainlands of North America, namely, the two Californias; the unknown region extending between Upper California and the Rocky Mountains; the Vale of the Rio del Norte, or New Mexico; and Texas, or the country extending east of the Rocky Mountains to the boundaries of the United States of America. As to the Californias, see CALIFORNIA, vol. vi. p. 128. Of the country lying north and east of Upper California little is known: two lakes of great extent are stated to occur in it, of which one is said to be salt. The country, especially the region described, is mentioned in the article COLORADO. We shall conclude our survey with New Mexico and Texas.

New Mexico is a valley of great extent, included between the mountain-ranges with which the Rocky Mountains terminate towards the west and south. The eastern boundary of the range commences about 34° N. lat., and is in the plain which lies along the upper course of the Rio Gila. It is not known if this range is connected with the Sierra del Florido, which is about 90 miles southward from the mouth of the Gila; the name by which it is known, called Sierra del Sargamito, rises farther east, opposite the mountain-region called the Bolson de Mapimi, in the most southern bend of the Rio del Norte, near 29° N. lat., and extends northward to 40° N. lat., where it joins the Sierra de Mogollon. The Bolson ranges on an almost equal length, another, from 34° to 40° N. lat., and the long longitudinal valley between them is New Mexico. Its southern district, between 34° and 35° 30' N. lat., is a desert, covered with arid hills, which some close up to the banks of the river, some are nearly without vegetation, except in some narrow valleys traversed by rivulets. This district is called Deserto del Muerto. The northern district, between 35° 30' and 38° N. lat. is a valley, from 20 to 40 miles across: this part has been settled, and produces grain enough for the consumption of the inhabitants. But the most interesting part of the province consists of its pasture-grounds, which feed numerous herds of sheep, their plantations of tobacco, and the wild animals which inhabit the adjacent mountains. The most northern part of the valley, between 36° and 38° N. lat., is marked by the amount of the severity of the climate, which even in the settled part is so great that the Rio del Norte, though a rapid river, is annually covered with ice for several months. This circumstance is partly to be attributed to the altitude of the country, since even in the interior plains are covered with eternal snow, but chiefly to the elevation of its surface, which Humboldt thinks cannot be less than 2000 to 2500 feet, an estimate probably rather than below than above the truth. Rain is very scarce, and usually only falls in short showers at all; the snow however, which covers the ranges to the
strait; but these straits are much deeper than those farther south, and afford in several places good anchoring ground for vessels of moderate size; so that Texas has more and better harbours than all the Mexican States on the Gulf of Mexico taken together. The bars on the rivers have deep water out, but, because their course is less rapid and their waters less troubled, as they do not descend from countries at a great elevation above the sea-level.

The low country along the coast extends about ten or twelve miles inland; it is not, like the country south of the Rio del Norte, a sandy desert without vegetation, but suffers rather from superabundance of water, being a great part of the year inundated or in the condition of a swamp. Behind this low swampy tract the country rises imperceptibly for some miles, but, from the great transparency of the air, the elevated plains are scarcely visible from the sea, and have, with nearly level surface. The width of this plain varies considerably, as its northern and western borders form nearly a crescent. Near the boundary-line of Louisiana it is from 40 to 50 miles wide. At the north-western corner of the Gulf of Mexico, between the rivers Trindad and Guadalupete, its width is stated to be 70 or 80 miles; but on approaching the Rio del Norte it narrows to 20 or 25. This plain is from 10 to 30 feet above the water-level, and here are many large lakes, some of them extensive. In the banks of the rivers, it is not subject to inundation. The tide, though it varies only from two to three feet, ascends the rivers to the distance of 45 or 50 miles from the sea in a straight line. The whole of this plain is wooded, with the exception of the banks of the rivers, where are found large tracts of forest, which are destitute of trees, and exhibit fine prairies. The forests consist of different kinds of oak, hickory, iron-wood, sugar-maple, and other useful trees, which are found in the southern states of the American Union. It is supported by the fact that these trees are among the food of the deer, and must have sustained a large and valuable population. The entire forest is a vast and almost impenetrable wilderness, extending from the banks of the rivers, which are numerous, and generally wide, so that they perhaps occupy one-fourth of the surface. Their soil is alluvial, and in the present state covered with trees of large growth, a certain indication of the fact that the rivers are old, and have sufficient fall to draw off the superabundance rapidly, the inundations are of short duration, and serve only to impart new vigour to the soil. The country between the rivers is generally rising from them with a gentle seclivity to an elevation of 200 to 300 feet, and the most part an undulating surface, on which isolated hills of moderate elevation are dispersed. By far the greatest part of this tract is destitute of trees, which occur only in isolated patches, and in a considerable distance in the uplands another. The most extensive of these wooded islands cover the bases and declivities of the hills. The remainder of the country is covered with grass, which affords excellent pasturage. As the grass maintains its verdure for many months, it appears that is less arid and destitute of moisture than farther north, or on the table-lands of Mexico, and it is thought that extensive tracts of it may be cultivated with wheat or other grains. The least fertile district of this part occurs about the sources of the Sabine river, where the country rises into hilly and well-cultivated soil and overgrown with pine-forests. It resembles that part of Louisiana which lies between the Red River and Arkansas west of Natchitoches.

Texas is the most fertile country for agricultural purposes to its numerous rivers and the regularity of their course. These rivers, when the country shall be well settled and cultivated, will materially contribute to its prosperity, as all of them, even those which run only fifty miles, are navigable for small craft in the rainy season. The most remarkable of these rivers from west to east are the Rio Nueces, which flows about 250 miles with a general south-eastern course; the Rio Guadalupete, which is nearly as long, and which falls into a lagoon forming the harbour of Rio Grande; the Colorado, and the Rio Pecos. The river of the latter course the mountain-tract of Texas, and upwards of 400 miles.
miles, and falls into the Laguna constituting the harbour of Matagorda; the Rio Brazos, or Brazos de Dios, whose origin is near to that of the Red River, and which, flowing chiefly in a north-south-easterly direction through a very fertile tract, falls into Galveston Bay. As to the Red River and Sabine River, which separate Texas from the United States of North America, see Louisiana.

Mexican Agriculture is of great importance. There is a great difference in the climate of the different regions of Mexico, there must be a corresponding variety in their productions. Humboldt asserts that within these states almost all the vegetable productions may be grown which are found between the equator and the polar circle. The agricultural productions which actually are grown prove the justice of this observation. On the highest of the table-lands, that of Toluca (9000 feet) wheat does not succeed, nor does it succeed in Europe beyond 66° N. lat. On the table-lands near Mexico, the cultivation of barley and the plantations of the American aloes, which may be considered as the vineyards of Mexico, the juice of this plant being converted into a kind of wine, called pulque. [AGAVE.] It is however remarkable that in the southern states of Mexico there is no cabbage, nor any of the other vegetables that play so important a part in the diet of Europe. This shows the difference in the climate of countries which have a great elevation above the sea, and those in which it depends on geographical position only. Most of the table-lands however are from 6000 to 7000 feet above the sea; and as this is one of the most fertile lands in the world, where we find the best cultivation of the cereals of Europe, with the exception of oats, which are not used, as horses in Mexico are fed on barley. The fruits also are those of Europe, as peaches, pears, apricots, peach, figs, pomegranates, etc. The vegetables are those of Europe, among which asparagus, called chile, is most abundantly grown, as it is used all over the country nearly as salt is in Europe. The plantations of Aliso are extensive. The difference between the agricultural productions of the Tierras Templadas and Calientes is not well established. Maize is grown everywhere, and constitutes the principal food of the lower classes; and it is the only grain which is cultivated for food, rice being only grown to a small extent in the wet countries along the Rio Huanacuaco. But the plantations of plantains and those of manioc are extensive; and beside these, Oxalis tuberosa, Dioscorea alta, and batatas are cultivated on a large scale. Oranges, lemons, which do not exceed ten months’ the year. Cocoa is collected in the low country along the river Huanacuaco; and indigo along the southern coast, but only for home consumption. Tobacco, which in many parts succeeds very well, it only permitted to be grown in certain places, as government, which derives a considerable revenue from the land tax, and limited the cultivation to certain spots to prevent all evasion of the tax. Three plants grow wild in the forests, at the base of the steep ascent which divides the low eastern coast from the table lands, and supply articles of export— the vanilla, and the vanilla.

All the domestic animals, which have been brought over from Europe by the Spaniards, have multiplied greatly in Mexico, owing to the wide tracts which are not or cannot be cultivated, and which furnish pasture-grown cattle. Horses are much drier; and wool an article of exportation.

Horses abound generally, and in the north-eastern provinces a great number are found in a wild state: they are easily taken and broken in. Horses and mules are exported in great numbers to the United States. On the great plains bordering on the Red River and Arkansas the American buffalo, which during the winter the buffaloes traverse the hills of San Saba, and pasture on the plains along the lower course of the Rio del Norte, is not a good description of a very rich breed. In fish. Bees seem to abound on the peninsula of Yucatan, and the cochineal insect is reared with great care on the table-land of Mixtetapan, whence by far the greatest part is brought to the market of the world. In the Gulf of California pearl oysters are found, and very good ones were collected, but it seems that this branch of industry has declined.

Mexico is noted for its mines of gold and silver. The gold-mines occur chiefly on the western side of the Sierra Madre, north of 24° N. lat.; the silver-mines are richest on the mountains which rise on the table-lands, and in those which border their margin. During the civil war, which began in 1810 and lasted for many years, the greatest part of the mines were neglected; the working was however renewed in 1825, chiefly by the English mining companies which sprang up about that time. Before that event (from 1810 to 1825), the produce was much less than it had been before 1810. Since the year 1825 it has considerably increased, though it has not yet reached the extraordinary extent of the Spanish period. Mexico has abundance of copper, iron, and lead, which are worked. The iron-mines however have only been opened since the year 1825. A quicksilver-miner is worked at S. Onofre, on the northern declivity of the Sierra Madre, in the state of Guadalajara. Tin is also stated to be of considerable extent, and carbonate of soda, called tequesqui, which is necessary for the smelting of the silver ore, is collected in several lakes, where it is found crystallized on the surface in great abundance. It is also stated that there are extensive iron-works in the upper layers of the soil, where it appears in the form of an efflorescence in the month of October, after the rains have ceased.

Inhabitants.—The population of these states is composed of creoles or descendants of Europeans, of Indians or mulattoes, and of those of mixed blood. The number of Europeans, who are called Gachupines, and formerly amounted to 80,000 individuals, has been much reduced by the expulsion of the natives of Spain; and though many individuals of other nations, especially Englishmen, have settled in these states during the last twenty years, it is supposed that the whole number of Europeans hardly amounts to more than 20,000 or 25,000.

The bulk of the population still consists of the descendents of those men who inhabited the country at the time of the Spanish invasion. Humboldt thought that they constituted two-thirds of the whole population; but he asserts that no natives were mixed up with the white population in Sonora, and that in Yucatan they really constituted more than half the number of the inhabitants, it is probable that the natives form one-half of the whole population, especially if we take into the account the numerous tribes which occupy the large tract of unknown country between Upper California and the vale of the Rio del Norte, and which are computed to amount to 300,000 individuals; though this number is probably exaggerated.

The aigial tribes of America resemble one another in the principal features of their face and body, which, according to Humboldt, are the following: the colour of their skin approaches that of copper; their hair is black, lank, and so smooth, that it always appears as if it had been wetted; and they have little beard, their nose is rather short and stout; their eyes small, long, and a little raised towards the temple-bones, as in the tribes which belong to the Mongol race. Their cheek-bones are prominent, their lips thick, and their mouths exhibit an expression of soberness which forms in the latter a remarkable contrast with the rigidity of their looks. Though they thus greatly resemble one another in personal appearance, the tribes into which they are divided speak languages which are said to differ as far from each other as the English from the Spanish. Humboldt states that twenty languages of this description were spoken within the territories of the states south of 33° N. lat.; but it would seem that he has not comprehended in this number the eight nations which live
within the boundary of Sonora, or the northern portion of the state of Occidente. The number of tribes which are still entirely independent, and live north of 23° N. lat., is not known, and seems to be very great. The language which is most extensively spoken is that of the Aztecs, which seems to be understood by nearly all the tribes which inhabit the country between 16° and 25° N. lat. The language of the Omintes, which is spoken in the counties along 20° and 22° N. lat., is remarkable for its structure, which resembles that of the Chinese language, being composed of monosyllables. (Naxera, De Lingua Olotmitorum Dissertatio, Philad., 1835, and London Geographical Journal.) Next to the language of the Aztecs, that of the Omintes is the most widely spread.

The natives who have submitted to the dominion of foreigners have attained different degrees of civilization. Those who inhabit the country between 18° and 23° N. lat. were, on the arrival of the Spaniards, subjects to the kings of Tencotitlan and Michoacan, or united in the republics of Tlaxcallan (Tlascalan), Hueuchoxingho, and Chollollan, and had then attained a considerable degree of civilization, as is proved by the ruins of their religious buildings, or templos, their causeways and dikes, their hieroglyphics, paintings, and sculptures; and though the objects of their agriculture were only few in number, their cultivation was extensive, and carried on with considerable care. They seem to have been of a more warlike and enterprising turn than the cultivators of the coast, on which they were born. Their present condition is not worse than that of the lower classes who cultivate the ground in most parts of the European continent, but they appear to want, and accordingly indolently pass their lives; and the exclusion of all foreigners. The countries north of 24° N. lat. were inhabited at the time of the conquest by tribes resembling those of the United States of North America. They had no fixed dwellings, and lived mostly on the produce of the chase. So abundant in the forests whose vegetation is so scanty, and which are destitute of trees, their numbers were small, and they speedily retired from the large plain east of the Sierra Madre to the mountain tract called the Bosón de Mapimi, where they still continue their savage state.

They have also disappeared from the plain which extends along the Pacific to the Rio Mayo. In these two plains a few natives are only found along the southern boundary-line, and these seem to have settled there from the United States of North America. In the valleys north of the Rio Mayo the natives resisted the invasion of the Spaniards, and were only subjected by the Jesuit missionaries. The padres accustomed them to a civilised life, and taught them the principal mechanical arts; their success was greater among the inferior tribes than among the other nations. Their preachers of the converts, and the good missionaries who laboured in the famous missions of Paraguay. Though these Indians inhabit the same country with the numerous white families which have spread among them, they live in separate places, and have close intercourse between them, except for the purposes of trade. In the arts of domestic life they seem to approach nearer to the Europeans than the Aztecs, and they certainly exhibit a greater degree of energy and mental power than the last-mentioned nation.

The Indian Brave, or savage tribes, inhabit the country north of 33° N. lat., along the Río Gila, the Bosón de Mapimi, the mountain-ranges which include the vales of the Río del Norte and the north-western district of Texas. Many of them are driven by the APParaches and Comanches, the most numerous of the tribes, and are still at open war with the white settlers. For protection of the latter the Spaniards erected presidios: a presidio consists of a wooden wall of a quadrangular form, within which the houses are built, and to which they are shut at night. They are inhabited by a few white families, and a small number of soldiers for their protection. The inhabitants of the presidios cultivate the adjacent grounds, and keep large flocks of cattle and sheep. But do not venture to pass the night without the walls. The Indies Bears generally live in the vicinity of the town, and are the numberous inhabitants of the tracts which are visited by the buffaloes. It does not seem that they cultivate the ground.

Within the state of Chiapas, called also Las Chiapas, comprehends the western part of the table-land of Guatemala, as far as it belongs to the Mexican States.
and a portion of the plain of Tabasco, the river of that name forming for a considerable distance the boundary-line between Chiapa and Tabasco. Though its soil is in general fertile, and the climate favourable to the growth of tropical productions, it does not appear to contribute any article to commerce, except lignum, which is floated down the rivers Usumasinta and Tabasco to Villa Hermosa. Near the banks of the Rio Chamas, a tributary of the Usumasinta, are the ruins of Panuco, and salt collected in the lagoon is traded for corn grown with trees. They are stated to extend for more than twenty miles along the summit of a ridge, and, as far as can be inferred from their architecture, they seem to owe their origin to a people more resembling in taste the Egyptians than the Mexicans. Their existence dates from Central America up to 1525, when it was united to Mexico, without the republic of Central America having renounced its claims on it. The capital is Ciudad de las Casas, formerly Ciudad Real, in a very fertile country, with about 4000 inhabitants. It has a college for Catholic clergymen, and a monument has been erected here to the famous Las Casas, the protector of the Indians, who was bishop of this province, and died in 1566. Some other places are still more considerable: Chamula, with 6000 inhabitants; Cuautla de los Llanos, with 7000 inhabitants; Comitán, with 6000 inhabitants; and Tuxtla, with 4500 inhabitants.

The state of Yucatan comprehends the peninsula of that name as far south as 21° N. lat. It exports much cam- pence, which is floated above the sea on rafts, and also on the western, south of 20° 30' N. lat., and also a considerable quantity of bees-wax. The Mayas, who live in a state of independence, occupy its southern district. The principal article of its commerce is copal, a gum used in the manufacture of incense, for many miles inland. The capital is Merida, with 28,000 inhabitants, situated on an arid plain about twenty-five miles from the sea. It carries on a considerable commerce by means of the harbour of Sisal, which is properly only a roadstead formed among the reefs called Bajo Sisal, twelve miles long. Farther east is Valladolid, with a population of 3000 inhabitants, in a district in which much cotton is grown. On the eastern coast is Salamanca de Bacalar, with 2000 inhabitants, whence much mahogany and fustic are shipped, in a district on the table-land, 4000 feet above the sea-level. It exports cocoa, coffee, Tabasco pepper, indigo, and vanilla. The capital is Villa Hermosa, also called San Juan Bautista, on the river Tabasco, about fifty miles from the sea, to which place vessels of moderate size may sail. It carries on some commerce, and contains 6000 inhabitants.

The state of Oaxaca extends over the greater part of the table-land of Mixtecapán, and is rich in agricultural pro- ducts: the industrious inhabitants rear the cochineal-insect and the silk-worms, and sell themselves to the cultivation of indigo. It has some mines of gold and silver in the mountain-ridge which separates it from the low plain of Tabasco, but they do not appear to be rich. This state contains several antiquities among which are the ruins of the palace at Mitla, which differ from the ruins of the edifices erected by the Aztecs, and approach in style nearer to those of Greece. They lie on the table-land, 5300 feet above the sea. The capital, Oaxaca, which contains 40,000 inhabitants, is situated in a depression of the table-land, 4400 feet above the sea-level. It is well-built, has fine houses, squares, and aqueducts, and contains some manufactures of sugar, chocolate, and silk. Tehuantepec is situated about ten miles from the sea, on a plain on which indigo and cocoa are raised, and which drains its southern side into the Bajo Sisal, which is a part of the sea. It contains about 7000 inhabitants, and carries on some commerce by the harbour called Ventosa, or Tehuantepec Road, which is only an open roadstead, but has good anchorage.

The state of Vera Cruz comprehends the whole coast of the Gulf of Mexico, from the river Huasacaleo on the south-east, to that of Panuco on the north-west, and, in some parts, extends over the mountains which border the table-lands on that side. According to the climate and vegetation, its most elevated parts are covered with pine-forests. Within its boundary-line are situated the Peak of Orizaba, the Cofre de Perote, and the small volcano of Tuxtla. Its commercial products are sugar, coffee, salt, sarsaparilla, and vanilla. Tobacco is extensively grown. In the northern districts of this state, in a forest near the village of Puebla, is a pyramid built of hewn blocks of porphyry, which are worked with great care and skill. The capital is Vera Cruz. [VERA CRUZ.] Alvarado, about three miles from the mouth of the Rio Verde, is a small town, which however carries on some commerce, its trade is not good, of great depth, and well defended from the winds; but the bar at the entrance of the river does not admit vessels that draw ten feet of water. The harbour of Huasacaleo, at the mouth of the river, is very good, and is little frequented. At the most northern extremity of the state is the town of Tampico, or rather Pueblo Viejo de Tampico, built on the border of a large shallow lake, the Laguna Tampico, which communicates with the Rio Pina near its mouth. It contains about 4000 inhabitants, and is ill-built. It carries on a considerable commerce, which however has lately decreased since the new town, called Pueblo Nuevo de las Tumulapapis, has been founded on the northern side of the river, about three miles from it. The interior of the state is the same as that of Vera Cruz, built near the base of the steep ascents, each containing about 3000 inhabitants; in their neighbourhood much tobacco and coffee are grown. On a level spot, situated on the steep ascents, is the town of Xalapa, or Jalapa, 4353 feet above the sea, which has very few inhabitants. It con- tains 13,000 inhabitants. To this place the merchants of Vera Cruz retire when the viento prieto is raging along the coast.

The state of Puebla comprehends by far the greatest portion of the table-land of Tlascalantla, and also a considerable portion of the lower but very hilly country, which extends to the Pacific, between the table-land of Mixtecapán and those of Tenochtitlan and Mieheacan. It contains the province of Puebla and Tlaxcala, and is divided into the following districts: the northern district is the town of Cholula, built in a well-cultivated plain, on the south side of a hill which is wooded to its summit. The houses are all of stone, large, and commodious. The churches and convents are very numerous and well-built. Puebla is considered the finest and most magnificent edifice in the whole republic, and very rich. The town contains between 50,000 and 60,000 inhabitants; it has some manufactures of cotton, wool, and earth-ware, and is much frequented by the natives, who have greatly declined since the commerce of Mexico has been thrown open. Its trade with the neighbourhood is considerable. South-east of it is the town of Tehuacan, which is stated to contain a population of 10,000. North and north-east of Puebla are the towns of Tlaxcala (3000 inhabitants of the state, and (3000), whose inhabitants, with those of the country about it, enjoyed some privileges before the revolution. For a notice of Cholula see CHOLULA.

The state of Mexico comprehends the two table-lands of Tenochtitlan and Tlaxcallan, in all their extent, the north-western part of the state, and the southern part of the table-land of Tlascalan, and a consider- able part of the lower but much more hilly country, which lies to the south of the two first-mentioned table-lands, and extends from them to the Pacific. The river Tlaxcallan drains its southern districts, and flows north-west to the north-western, under the name of Rio de Lerma; not far from the morass, in which it takes its origin, is the Nevado de Toluca. Though nearly all the productions of the tropics, together with those of the semi-tropical districts, are got in the northern district, under the name of Rio de Lerma: this state, none of its agricultural productions supply an article for exportation; the sugar cultivated in the plain of Cuautla y Amípas, south of the table-land of Tenoch- titlan, and in some other places, to the north-westward, is consigned in the country. It contains several rich mines of silver. This metal does not appear to occur in the mountains which enclose the table-land of Tenoch- titlan, but only in the mountainous district which constitutes the most northern west portion of the state, and where the Sierra Madre is connected with the mountains border-
ing the eastern margin of the table-lands. In this district are the mines of Real del Monte, Acopan, and Zimapán: these are some of the richest of the mining districts south of the table-land of Toluca, the principal mines of which are in the neighbourhood of the small towns of Temascaltepec, Sultepec, Tlacuautla, and Tetela del Rio, of which the three last-mentioned places are near the eastern boundary of the mining district. A large amount of mercury is collected in the districts surrounding the lakes of Tzeczuc and S. Christoval. In the vale of Tencochitlan are several antiquities. Near the town of Texcoco are two large Mexican pyramids, or tecazulas; and about twenty miles farther north, near the town of Teotihuacán, is an island of many such pyramids, two of which, erected in honour of the sun and moon respectively, are of great dimensions. On the mountainous descents by which the road leads from Tencochitlan to the Pacific, near the town of Guanavacatero, are some remarkable ruins, which seem to have been a fortress; they are called the fortress of Xochicalco. For the description of the federal capital, see Mexico. The capital of the state is Texcoco, situated on the eastern border of the lake of that name; these waters formerly approached the town, but are now about three miles from it. It is a small place, but has much increased since it has been made the capital of the state; it contains about 3000 inhabitants, and some manufactures of cotton. Chalco, with 3000 inhabitants, is on the eastern extremity of the table-land of Toluca, with 12,000 inhabitants, ten miles north of the city of Toluca, has a fine cathedral, and is well built. Zimapán, a considerable place, with 9000 inhabitants, is situated in the centre of the northern mining district. The state of Mexico extends on the Pacific coast, on Acapulco and Zacoalula, at the mouth of the river Bobos; but they are little frequented.

8. The state of Michoacán extends over the whole of the table-land of Michoacán and the low country lying between it and the Pacific; a portion of the hilly country south of these districts also belongs to it. The river Santiago traverses its north-eastern districts, and within its territories are the lake of Patzcuaro, the peak of Tancitaro, and the city of Churúlco. Its crops are abundant; but no article of export is supplied, except from the mines, which are situated on the eastern border of the state, in the mountain-range which runs between the table-lands of Toluca and Michoacán. The richest mines are near Tlapujahua. Agua de los Banos, considerable quantities are exported from the Rio Bobos. Carbonate of soda is collected in the eastern border, and salt is made along the coast. At the southern extremity of the state, in the district of Colima, is the volcano of Colima. The capital of the state is Guadalaxara, with 60,000 inhabitants. [Guadalaxara.] The second place in importance is Lagos, near the eastern boundary, on the table-land of Querétaro, which contains 12,000 inhabitants; it is the seat of the bishopric of S. Juan de los Lagos, nearly as large a town, built in a deep dale, and noted for its annual fair, which is held in the month of December. The town of Tepic is situated in a small plain, surrounded by volcanic hills, and considerably elevated above the sea; it has a considerable quantity of muslin, and is situated at a point on the road from Lagos to Guadalaxara, which are little frequented. The low country surrounding the Volcano de Colima constitutes a separate district, which is under the general government. This district contains about 150,000 inhabitants, and much cotton is grown.

10. The state of Guanajuato comprehends the western districts of the table-land of Querétaro, a part of the Sierra Madre, and a tract north of that range. A range which forms the boundary of the state of Querétaro, with the plain in a southern direction, terminating south of the town of Guanajuato. The widest and most fertile part of the Bajío lies within the territory of this state, which exports great quantities of wheat and Indian corn to other states. The table-land of Guanajuato is mountainous; the capital [Guanajuato], it contains several populous places. In the Bajío—Zelaya, with 10,000 inhabitants, and a fine cathedral; Salamanca, with 15,000 inhabitants; Irapuato, with 16,000 inhabitants, and manufactures of cotton; and Villa de Leyva, with between 12,000 and 15,000, is the most important. In the last-mentioned town are considerable manufactures of cutlery and saddlery. San Felipe, in a wide valley between two branches of the Sierra Madre, was formerly a considerable town, and now has 16,000 inhabitants, and manufactures of cotton and iron.

11. The state of Querétaro extends over the eastern portion of the table-land of Querétaro, and over a considerable part of the plain north of the Sierra Madre. It contains numerous towns, and is remarkable for its scenery; at present it has some productive silver mines, which lie near its eastern boundary-line, along the river Moreztzuma or Panuco, in the district of Cadereita; the most famous is El Doctor. North of it is the quicksilver-mine of San Onofre. There are also some lead-mines. The capital is Querétaro. [Querétaro.] Caderita, in the mining district, is a considerable place.

12. The state of S. Luis de Potosí comprehends by far the larger part of the southern portion of the great northern plain, and is traversed from west to east by the Rio Tamón, an affluent of the Panuco. It is only rich in cattle. The mines are not numerous, but among them is the rich mine of Catorce. There are also some mines of copper. Potosí, the capital, and S. Luis de Potosí, is a large town, containing the adjoining villages, from 50,000 to 60,000 inhabitants. It has wide and well-arranged streets, which are lighted by night. There are many large and substantial buildings, and numerous churches. The Palacio, or House of the Government, is a very fine building in the centre of the town, a large square on one side of the Plaza de las Armas; on the opposite side stands the cathedral; the two other sides are composed of shops and dwelling-houses. In the centre is a fountain, with a statue of the Virgin of Guadalupe, on an elevated pedestal. The surrounding country is very productive in fruits, and the commerce is considerable.

13. The state of Zacatecas extends on both sides of the Sierra Madre, which traverses it towards its southern extremity in a north-western direction: the larger portion of
its territory lies on the great northern plain. The southern portion is productive in grain, and the northern arid plains contain abundance of cattle. Of the numerous mines, all of which are situated in the Sierra Madre, the most celebrated are those of Zacatecas. The lead ore is smelted in the town. The gold ore is sent to Mexico City for reduction.

14. The state of Durango includes the Sierra Madre from 2° to 27° N. lat., and comprehends also an extensive tract of level country skirting the range on the east, and beyond the desert near the Pacific Ocean. The elevation of the mountains descends on the east, and is in the upper region of the Sierra Madre, and descends to the sea. There are also mines of lead and abundance of iron ore. Between the town of Durango and that of Nombre de Dios is a plain, covered with grass, about thirty miles in length and fifteen in width. This plain contains an extinct crater, the remnants of which are marked by a few small lakes, and a yarding deep. This sterile strata is called Brefia. The capital is Durango, or La Ciudad de Victoria, with 22,000 inhabitants, a well-built place, with wide streets and several fine buildings. Nombre de Dios has 7000 inhabitants. Pапасуарко, in the north of the state, has 8000 inhabitants. The population of the state is 60,000.

15. The state of Coahuila comprehends the provinces of Ciudad Victoria and Sonora, or the whole tract extending between the Sierra Madre and the Gulf of California from 23° to 33° N. lat. It is rich in agricultural produce and fruits, though agriculture is in a backward state. It contains several fertile districts far from it, and the greatest importance is attached to them. At the most northern extremity, on the banks of the Rio Gila, and rather beyond the boundary of the state, are the Casas Grandes, ruins of numerous edifices which cover a large space. They are considered as one of the most important mounds of modern America. South of the Rio Mayo the population consists of whites, but north of it are several tribes, Opaia, Cerez, Pimas, Yaqui, Mayos, Yumas, and Turumamas, which subsist by agriculture. Along the northern boundary, on the Rio Gila, the Apaches of the extremity of the state lead a wandering life. The most remarkable places from south to north are—El Rosario, with 6000 inhabitants, in the neighbourhood of some mines. It carries on some commerce by means of the harbour of Mazatlan, which is also supplied with muleteers. El Paso del Norte, with 16,000 inhabitants, is on the southern bank of the river Culiacan, just above its confluence with the Rio Mayo. It carries on considerable trade. El Fuerte, the capital of the state, was till lately a small village, and has only risen to be a thriving town since it has been made the seat of the state government. It is built on the southern bank of the Rio del Fuerte, and contains 5000 inhabitants. Los Alamos, between the Rio del Fuerte and Mayo, has about 6000 inhabitants, and considerable silver mines in its neighbourhood. It contains many well-built towns and villages, and the houses are scattered in every direction. It contains however some good houses, and carries on a considerable trade. Arispe, the most northern town of any importance, contains 3000 inhabitants, and is the principal seat of the trade on the Rio del Norte, being the most important on the Mexican side of the border of the state against the Apaches. The hilly country which lies to the west of this town, called Pimera Alta, had the reputation of containing rich gold-mines, which however, on examination, have been found to be of little value. There is a wonderful valuable copper-mine.

16. The state of Chihuahua comprehends that portion of the northern plain which lies between the northern part of the Sierra Madre and the middle course of the Rio del Norte. It comprehends the mountain-region of the Bolson de Mapimi, and a tract of country south of the Bolson del Mapimi, which is in general very dry, and unfit for agricultural purposes: cultivation is limited to the river bottoms and a narrow strip of country along the declivity of the Sierra Madre; but this strip is valuable for the cattle and sheep. The mines are rather numerous. The most important are in the Sierra Madre, at El Parral, Botapillas, and Jesus Maria; those of S. Eulalia are in a hill which stands isolated on the plain, about twelve miles from Chihuahua. Near the base of the mountain of Gran Manto the Rio Mayo ascends to a height of 3300 feet, and then continues along the southern side of the state. The town of Mayo is a small place, situation at an elevation of 3000 feet. The Rio Mayo has a population of 20,000. The Rio Mayo is a tributary of the Rio Bravo, which is supplied by a river about eight miles above the town. Its population once amounted to 70,000, but at present it does not exceed 12,000. S. Bartoloméo, situated towards the mouth of the river Mayo, contains a population of 28,000. It is badly built, and the streets are narrow, but it carries on a considerable commerce with the agricultural produce of the fertile district in which it is situated, consisting of wool, maize, cotton, and wild honey. The boundary of the state is El Pájaro, with about 50,000 inhabitants when the mines were productive, but now only 7000. Parras, near the lake of that name, is a small town in a district noted for its vineyards.

17. The state of Coahuila or Cohahuila extends over the north-eastern portion of the country, which lies between the Bolson de Mapimi on the west, and the lower course of the Rio del Norte on the east, and which stretches southwards to the boundary of Zacatecas (25° N. lat.). To this extensive country is added the still more extensive tract to the north and east of the Rio del Norte, or the province of Texas. The most sterile portion of the northern plain is included in this state, and lies along the boundary of Zacatecas. Further north, between 27° and 29° N. lat., are several watercourses with fertile bottoms, and considerable tracts of cultivable ground. But the northern mules and horses, constitute the commercial wealth of this country, and are exported in considerable numbers to the United States of North America. Texas is very fertile, but it is generally a part of the northern part of the state is much exposed to the predatory incursions of the Apaches and Comanches, who inhabit the Bolson de Mapimi and the hills of San Salvador. The capital of the state is Saltillo, situated near its eastern boundary and the edge of the table-land. It contains about 3000 inhabitants, and is remarkable as the only place at which the steep declivity with which the table-lands of Mexico terminate towards the east can be passed by heavily laden carriages; farther south at least no such place is known to exist. It has several good streets, commencing at right angles with the Plaza, in the centre of which is a large reservoir, which supplies the P. C. No. 932.
town with water. It carries on considerable commerce. In this town a fair is held, which is much frequented by merchants from the adjacent states. Montelovêz, farther north, has 3,500 inhabitants. Santa Rosa, to the north-west of Montelovêz, has 4,000 inhabitants, and some mines in its neighbourhood. El Presidio de Rio Grande is situated where the Rio del Norte begins to be navigable for large boats, and has 2,500 inhabitants. Morelos, farther down, is a thriving place, with some trade.

Texas is almost entirely in its natural state. The State has formed a few settlements in the districts adjacent to the Rio del Norte and the Rio Guadalupe, and their principal town is S. Antonio de Bexar, a small place. In the country farther east numerous emigrants from the United States of America and Europe have settled, but not one of these settlements have attained any degree of importance, except S. Felipe de Austin, a small town.

This country has a good harbour in Galveston Bay, which is an extensive sheet of water, separated from the Gulf of Mexico by Galveston Island. The entrance to it, between the mainland and the eastern extremity of the island, has always twelve feet of water on the bar. The bay has generally about nine or ten feet of water, but towards its northern extremity, into which the navigable rivers Trinidad and S. John empty themselves, the bay is shallow, and the Red Fishe Bay, which at high tides has only five feet, and in northerly winds not more than three feet of water. The anchorage between Galveston Island and another smaller one, called Pelican Island, is good, in five fathoms of water, with a fine bottom of shell; the inhabitants of this island who are descendants of Spaniards have been for some years in a state of rebellion against the government of the United Mexican States.

18. The state of Nuevo Leon lies almost entirely to the east of the mainland, in the lower region which extends from it to the Gulf of Mexico, but it does not reach the shores of the sea, being separated from it by the intervening state of Tamaulipas. Though this country is much elevated above the sea, and its climate resembles that of the Texas farther south, yet the surface is far more level than that of the country farther south. That part which lies south of the Rio del Tigré is indeed rather level, or undulating, but north of the river are mountains of great elevation, probably more than 40 miles above the sea, and rich mines are found near Pesqueria and Salinas. The lower parts of the country are very fertile, but only cultivated in isolated places. Though the climate is hot, it is healthy. Monterey, the capital of the state, contains 15,000 inhabitants. Commerce is considerable on account of the neighbouring rich mines. Linares has 4,000 inhabitants, and the neighbourhood abounds in cattle.

19. The state of Tamaulipas extends along the Gulf of Mexico from the mouth of the river to that of the Rio del Norte, and still more of the latter to the Rio Nueces, but it does not reach farther inland than from 50 to 70 miles, except at its northern extremity, where it may be about 150 miles across. It is a low country, in which only a few hills, which are in the eastern part of the state, extend their small points into the forest, in whose fustic and logwood are cut out to a great extent. The capital of the state is Pueblo Nuevo de Tamaulipas, situated at the southern extremity of the state, on the northern bank of the river Plancarte, about six miles from its mouth. The harbour is good and safe, and the bar at its entrance has generally twelve feet of water, but the navigable channel is scarcely a cable's length across. The town, which was founded in 1825 or 1826, is rapidly increasing. Its commerce, which as most of those who trade in Spanish goods are consumed on the northern plain are landed here. Sotol de Marina is a small harbour, not much frequented, near the mouth of a little river, the Rio de Santander, on the banks of which is the small town of Santander, formerly the capital of the state.

20. The territory of New Mexico comprehends the whole vale of the Rio del Norte, extending from its source along its upper course to 35° N. lat., and also the desert del Muerto and a fertile tract of country south of it, extending from 32° 30' to 31° N. lat. From the northern district great numbers of sheep are sent to the southern states, and wool is exported. The southern district contains some tracts adapted to raising agricultural products and fruits. The Chihuahua and the Durango districts contain copper-mines. The mountains to the east and west of it are inhabited by several tribes of Indians, as Utaa, Nanahawa, and Keraa. Many of them are settled among the villages in the lower drainages of the Río de los Fieles, the capital, is built on a small stream which joins the Rio del Norte from the east, and at a great distance from the last-mentioned river. It contains about 4,000 inhabitants, and has some commerce with the United States of America, and with the towns of Taos, which, according to Humboldt's statement, has a population of about 9,000 souls. Paso del Norte, in the district south of the desert del Muerto, has a population of more than 5,000 souls, and is situated on the northern border of the State of Texas.

21. Lower California, and—22, Upper California. [CALIFORNIA].

Manufactures.—Before the Revolution (1810) there were many flourishing manufactories, the annual produce of which was estimated at 100,000 pounds of silver and copper, and about two millions of Mexican dollars, or about two millions of English money. The most considerable were those of cotton and wool in the towns of Puebla, Cholula, Tlascala, Queretaro, Lagos, Guadalaxara, and Tacaeo. The manufactories of soap, leather, and saddlery are still flourishing. The mining industry has increased their prosperity to the high price at which, under a system of monopoly, European goods were sold in that country. After the harbours were opened to a free trade (in 1820) the trade began to decline. The manufacture of cotton is now almost completely destroyed. Those of wool are in a lingering state, but those of soap, leather, and saddlery seem to be on the increase.

Commerce.—The commercial intercourse between the State and the coast has greatly increased of late, and particularly, the trade to Durango and the towns of the northern plain. In even those parts where there is no obstacle to the use of carriages, the goods are commonly carried by mules, on account of the great number of these animals, and the low price at which they are bought.

The maritime commerce is considerable. In the beginning of the present century the exports, according to Humboldt, amounted to twenty-two millions of Spanish dollars, but the returns of the Mexican Consul at Washington between 1820 and 1830 show the exports considerably diminished. The account of the comparatively small produce of the mines, the precious metals constituting the principal article of exportation; and as they have not yet been restored to that flourishing state in which they were before the revolution, the amount of the exports probably still falls considerably short of the amount stated by Humboldt, for the other articles have not increased much. According to Humboldt's estimate the value of the exports consisted of the following articles, and their value in dollars:

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold and silver</td>
<td>17,000,000 dollars</td>
</tr>
<tr>
<td>Cochineal</td>
<td>2,400,000</td>
</tr>
<tr>
<td>Sugar</td>
<td>1,300,000</td>
</tr>
<tr>
<td>Pluer</td>
<td>300,000</td>
</tr>
<tr>
<td>Indigo</td>
<td>50,000</td>
</tr>
</tbody>
</table>
The commerce is mostly carried on in foreign vessels, as these states have a comparatively small number of merchant ships. The vessels of the United States and those of the British isle are therefore chiefly confined to the harbours of Vera Cruz, Tampico, and Tamuapillas. Next in number to the American are the British vessels, and then those of France, from Bordeaux and Havre, and lastly those of the free German towns of Hamburg and Bremen. Swedish and Danish vessels rarely appear in these ports.

**History and Constitution.**—Though Columbus in his last voyage approached the peninsula of Yucatan, he did not come in sight of it. Thirteen years later (1517) the peninsula was discovered by Francisco Hernández Cordova, who sailed along the coast from Cape Catoche to Campeachy Bay. The following year, Juan de Grijalva continued the discoveries along the same coast northward to the mouth of the Rio Panuco; he visited the islands of Sacrificios and San Juan de Ulua, and in the present harbour of Vera Cruz, and gave them the names which they still preserve. His account of the wealth of the country excited the desire of conquest. In 1519 Hernan Cortes landed at the place we now Vera Cruz, and, although the town was but a small collection of huts and called Villarica was some miles farther to the north, was a small town called Chihuauita. With his little army he soon ascended the table-land, numerous inhabitants of which he found united under a powerful sovereign, the king of the Aztecs, Montezuma, the name of which was Azteca, within the limits of this empire there were some small republics, of which that of Tlascalat united with Cortes. Cholutla was also a republic, and the name of a third is preserved, that of Huajocingo; all three were conquered by Cortes. He then followed the commercial intercourse seems to exist between Central America and the Mexican states, but a considerable number of mulas and horses, and some wool, are exported to the United States of North America, chiefly from Cochabamba and New Mexico.

For want of a general and more recent estimate of the imports, we shall transcribe that of Humboldt, found on facts which refer to the beginning of the present century. It may still be useful as showing the principal articles consumed in Mexico, and their proportion. Though the consumption of all these articles, with the exception perhaps of cocoa and wax, must have greatly increased, and especially that of cotton goods, yet it seems probable that their value in money is not greater than was paid for them at the time of Humboldt, as most of the articles were sold for double and some even for four times the present prices. Cocoa does not appear at present to form a large article of import, great quantities of it being grown in the state of Tabasco. Humboldt's estimate of the imports at the beginning of the present century is:

<table>
<thead>
<tr>
<th>Article</th>
<th>Value in dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ropas (linens, cottons, cloth, and silk)</td>
<td>9,200,000</td>
</tr>
<tr>
<td>Paper</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Brandy</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Cocoa</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Quicksilver (for the mines)</td>
<td>650,000</td>
</tr>
<tr>
<td>Iron</td>
<td>600,000</td>
</tr>
<tr>
<td>Steel</td>
<td>200,000</td>
</tr>
<tr>
<td>Wine</td>
<td>700,000</td>
</tr>
<tr>
<td>Wax</td>
<td>300,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>14,650,000</strong></td>
</tr>
</tbody>
</table>

At present it is difficult to form a correct idea of their condition among the natives, and to have thought that the government of that country could only be entrusted to persons who considered Spain as their native country; it therefore excluded all the Creoles, or descendants of Spaniards born in Mexico, from all offices of government, and even from commissions in the army. Such exclusion existed in them a considerable degree of ill-will against Spain and the Spaniards, which would probably have manifested
itself in resistance and rebellion, if they had not feared that the native population would take advantage of such a circumstance to effect their own destruction. They had still to fear another enemy, which had grown up imperceptibly among them. Few of the Spaniards had brought wives with them. From their intercourse with the native women sprang up a race called metis, or mestizos, which increased still faster than that of the Creoles, who however, being in possession of wealth, were considered as possessing a regular government subsisted they had nothing to fear either from the natives or the mestizos. This will account for the fact, otherwise difficult of explanation, that no signs of active disaffection manifested themselves in Mexico during the first third of the United States of North America had obtained their independence, though the Mexicans were well acquainted with the advantages which their neighbours had obtained. It is even possible that the political condition of Mexico would not have undergone any change for a long time, but for the events in Europe and in Spain in 1808. By the intrigues of Bonaparte the royal family were compelled to abdicate the throne of Spain, and he conferred the whole Spanish monarchy on his brother Joseph, then king of Naples. The Spaniards in Mexico and the Creoles were unanimous in declaring their resistance to the government established by the French. The viceroy could no longer receive orders from Spain, and it was necessary to organise a government which should act independently with certain sanctions of that authority. But as to this point they disagreed. The Creoles wished to establish a national representation; the Spaniards opposed the measure, and prevented the establishment of a system of national representation for Mexico. The Creoles submitted, but the Spaniards, carried away by the discussion which had taken place, and soon afterwards, in 1810, the natives and the mestizos rose against the government. They were headed by Don Miguel Hidalgo y Castilla, the cura or parish priest of Dolores, a small town in the state of Guanajuato. The Creoles sided with the Spanish government. Hidalgo, who had soon become an immense force with him, took Guanajuato by storm, and occupied Valladolid, whence he advanced over the table-land of Teuica to that of Tenochtitlan. At the same time the Spaniards had sent a new army to the assistance of the priests, which was defeated by Hidalgo on the 30th of October at Las Cruces, a pass in the chain which separates the tablelands of Tenochtitlan and Teuica. But notwithstanding this victory, Hidalgo retreated, and eight days afterwards was in his turn defeated by Calleja at Atotonilco. Hidalgo retired to Valladolid and Guadalaxara; and in the neighbourhood of the last-mentioned town he was again defeated, and soon afterwards taken prisoner and shot. In the meantime the Indian tribes rose in revolt, and in the south the leaders began to set separately. The most remarkable among them was Don Jose Maria Morelos, cura of Nuevopatria, who with great activity, talents, and success maintained the southern provinces in rebellion against the governor, and in 1811 was made central governor of the country, 1811, assembled in the town of Tzintzuntzan, in the state of Michoacan. But that town was soon afterwards taken by Calleja, and the junta were dispersed. Calleja however was soon obliged to march against Morelos, who had penetrated into the table-land of Tenochtitlan from the south. He was attacked by Calleja in the town of Cuautla, Amilpas, and after defending himself for nearly three months with great skill and gallantry, he abandoned that place on the 2nd of January, 1813. The junta now incremented in new members, and under the title of the National Assembly it declared the independence of Mexico, on the 13th of November, 1813. But after that event Morelos had less success in his daring enterprises; and in November, 1815, he was taken prisoner and conducted to Mexico. Many of his companions in arms maintained the conflict for some time, but they did not act in concert with one another, especially after one of them, Términ, had dissolved the congress, which had been transferred from Oaxaca to Tehuacán, and was in the Placetas. They were supported by the gallantry and skill of Calleja, destroyed successively the armies of these chiefs, so that when Don Xavier Minl, the famous Spanish general, chief, landed in Mexico, September 28th, 1813, the remnants of the insurgents was at such an ebb, that he was unable to restore their courage, and he perished in the attempt. The country gradually became more tranquil, and in 1820 it was restored nearly to the same degree of order which it had enjoyed before 1808, to which fortunate result the mildness of the new viceroy Apodaca materially contributed.

The events which occurred in Spain in the beginning of 1820 suddenly changed the aspect of affairs, and deprived Spain of the most valuable of her possessions in America, which it had regained at the cost of much blood and money. The Spaniards and the Creoles, who had formerly made common cause, were now divided into two parties, one of which was now the adherents of the king, anddeclined to the former party, wishing to overthrow the constitution in Mexico, and chose for his instrument Don Augustin de Iturbide, a young man, born in the province of Valías, of respectable but not wealthy parents. He had distinguished himself in the battles of the war, and shown great attachment to the Spanish party. Iturbide had about 800 men under his command, when, on the 24th February, 1821, at the little town of Iguala, on the road from Mexico to Acapulco, he was received in the name of Iturbide and since that time has been called the Plan of Iguala. Its object was to conciliate all parties. It was to establish the independence of Mexico, and still to preserve its union with Spain. To effect this, the crown of Mexico was to be offered to the king of Spain, and in case of his refusal, by his brothers, Don Carlos or Don Francisco de Paula, provided they would consent to reside in the country. Though Iturbide had certainly exceeded the powers which he had received from Apodaca, the viceroy, seeing that this proposal was without the consent of the king, he declared for Iturbide; and the Spaniards of the capital, alarmed at this delay, deposed him, and placed Don Francisco Novella at the head of affairs. But the disorders which always attend such violent changes gave Iturbide time to unite his troops against his enemies, and when the army of Sierra Morena arrived, these troops were lying in different parts of the country, and to bring over to his party all the western and northern provinces. Before the month of July, the whole country recognised his authority, with the exception of the capital, in which Novella had shut himself up with all the Spanish troops. At this juncture he received intelligence of the arrival at Vera Cruz of the new constitutional viceroy Don Juan O'Donojou. Iturbide hastened to the coast, obtained an interview with O'Donojou, and by a series of stratagems he compelled him to leave his position, and final settlement, it if should be approved in Spain. This is called the treaty of Cordova, from the place where it was made. Iturbide thus got possession of the capital, where a junta and a regency were established, but in such a form that all power remained in the hands of Iturbide. By a decree of the Cortes, dated the 13th February, 1822, the treaty of Cordova was declared to be illegal, null, and void; and Iturbide, who had the power in his hands, and a great number of adherents, found no difficulty in ascendency the throne. The army declared him emperor of Mexico on May 22, 1822, and he took the title of Augustin I. He was acknowledged by the Mexican congress, which had been opened on the 24th of February; but a struggle for power ensued among the three parties, which in October, 1822, was decided, and the emperor pronounced the manner as Cromwell dissolved the Long Parliament, on the 30th October, 1822. On the same day he formed a new legislative assembly, composed of persons favourable to his wishes and intentions. But he had not skill enough to reconcile his companions in arms to these changes. Several generals declared against his proceedings, and prepared for resistance. Iturbide, terrified at the storm which was ready to burst upon him, called together the old congress, assembled in Mexico in 1823, and went with it to Puebla. He was returned to Mexico in 1824. He had been outlawed by the congress, and upon landing on the coast, he was shot at Padilla, in Tamaulipas. Thus Mexico obtained its independence and a constitution, without a civil war. But as the object had only been obtained by the blood of the army, it was to be feared that the peace of the country would be interrupted by the discontent of the general. This has in fact occurred several times; but happily such events were of less moment, than the distinction which distinguished himself in the struggle against Iturbide. Under pretext of the country being discontented with the administration, he collected an army in 1832, brought some other generals over to his side, and, a year later, he succeeded in placing himself at the head of the government. Being aware that he was less distinguished as a statesman than as a general, he undertook in person an expedition
against Texas, the population of which consists almost entirely of emigrants from the United States of America, had risen into open rebellion against the government. After some success, he was taken prisoner. This circumstance was favourable to the government, and since that time the peace of the country has not been materially disturbed.

The constitution of the republic was formed immediately after the fall of Iturbide, and the Fundamental Act was published on the 4th of October, 1824; the constitution is modelled on that of the United States of America, and most of the articles have something of that grand simplicity which is so characteristic of the United States. Each state elects a representative for every eighth thousand inhabitants, and one more if there is a deficit exceeding forty thousand. Native Mexicans alone can be chosen, or such as have resided in the republic for more than eight years who must also possess landed property to the amount of 5000 dollars, or some trade or profession which produces 1000 dollars annually. The senate is composed of two senators for each state, elected by a plurality of votes in the state, and if the number of votes returns his seat for four years; the other only for two years. The members of the senate must possess all the qualifications requisite for a deputy, and must also be thirty years of age; a deputy may be only twenty-five years of age. The senate meets annually and holds its ordinary sessions on the 18th of April; but an extraordinary congress may be called by the executive. The executive power is vested in a president and vice-president, both elected by a majority of the number of votes. Native Mexicans only, who are thirty-five years of age and resident in the country, can be elected to these high offices. Though the great outlines of this constitution resemble, in all important points, those of the United States of America, the influence of Indian customs prevails in all their legislation, the government, and the power which it is not thought expedient to confer on the general government. In Mexico, however, the government had to establish the state governments, and could appropriate to itself as much power as its. (Humboldt, Essai Politique sur la Nouvelle Espanje; Poinset, Notes on Mexico; Lyon's Journal of a Residence and Tour in the Republic of Mexico; Ward's Mexico in 1827; Hardy's Travels in the Interior of Mexico in 1855-1856.)


MEXICAN ARCHITECTURE. Although some slight has of late years been thrown upon it by some writers, it is not much elucidated; nor can we do more than advert to one or two points that deserve attention. The first of these is, that the older and more important monuments of Mexico are not, strictly speaking, Mexican, but the productions of some of the aboriginal races of the country. Secondly, these remains are by some supposed to exhibit affinities, both in their general character and mode of construction, and the style of sculpture and the costume represented in them, to those of the Egyptians. Thirdly, heredity in the same as the walls of their edifices were engraved by both people.

With regard to the aboriginal architecture of this part of America, it resembles that of Egypt, not only in the vast scale and massiveness of its monuments, but in the application of the same forms composed of it. Pyramids not inferior to those of Egypt, and some of even still larger dimensions in their plan or base, exist in the Mexican territories; and examples of the second class occur in pyramid towers, consisting of a series of truncated pyramids placed one above another, each successive one being smaller than the one on which it immediately rests, so that it stands upon a platform or base and has a great tower or king, which was the pyramid tower or temple at Xochicuehcan, which, according to Nebel's restoration of it, consisted of five stories, and consequently had four terraces: its sides were ornamented with rude bas-reliefs, the figures of which were about four feet high, and had a profound tour or niche. The pyramid tower of Cholula resembles in no small degree the temple of Belus as described by Ierodotus, as inasmuch as it consists of eight stories, each forming a platform on which stands the one above it. The angle of inclination of these truncate pyramids on each other is less than that of the Egyptian, which differs little from that of the sides of the Egyptian temples.

Some of these edifices appear to have been temples only, but to have contained sepulchral chambers and apartments for the priests; they had also descendants leading down into caverned recesses or halls, that were doubtless used either for religious mysteries or as places of concealment for treasure.

One of the most curious and enormous monuments of this style of architecture was the great temple at Palenque (built, according to the bold assumption of Lord Kingsborough, after the model of that of Solomon), which comprised within its extensive precincts various sanctuaries and sepulchral chambers, courts, subterranean cells and galleries, covered by a ceiling, which served as the dwelling of the priests. The whole rests on a platform, composed of three graduated terraces, and forms a spacious quadrangle enclosed by porticoes. Within the temple on each side of the main entrance is an ascent or flight of stairs, and on the east a second flight leading down, after the first is ascended, into the cloistered court. Beneath the cloisters are what are conjectured to be has been in turnatories; and in the centre of the quadrangle is what is said to be the remains of an altar. This magnificent city of Palenque itself exhibits a variety of building, temples, palaces, baths, and private houses, all manifesting excellence of workmanship combined with considerable skill in design. The remains of a palace at Mitla show that it must have been an edifice of great extent and grandeur; and the walls appear to have been sculptured or tumbled externally, in imitation of mat or basket work, a species of decoration characteristic of the Toltecans and often found in sepulchral chambers. This same building has also a portico with plain cylindrical columns differing from any found elsewhere.

In order to give an idea of the extraordinary vastness of some of these Mexican or Toltecans constructions, we may reduce the inscriptions by the aid of the geographical chart of Chiapas, in which is marked, of Chiapas, the side of whose base is 1440 feet, whereas that of the great pyramid of Teocuic is only 735 feet. The height however is, according to Humboldt, not more than 177 feet, and as the remaining terraces are 12 or 13 feet lower, the area of the upper platform or terrace small in comparison with the area of the base, the outline of the whole would not be that of a continuous pyramid, but merely such as might be inscribed within such figure.

At Teozuacan, about eight leagues to the north-east of the city of Mexico, are an immense number of pyramids, several hundred small ones ranged in files or lines, and two larger ones consecrated to the sun and moon. Each is divided into four platforms, the slopes in each of which are covered with a colossal stone statue covered with plates of gold, which were stripped off by Cortes's soldiers, and the statues themselves destroyed.

Besides monuments which are chiefly works of magnificence, others exist which attest the high degree of civilization attained by the Toltecs, such as cyclopean roads and bridges. The former of these were constructed of huge blocks of stone, and frequently carried on a continued level, so as to be visible as high as 1000 yards throughout Central America numerous excavations or rock-hewn halls and caverns, called by the natives 'granaries of the giants.' They resemble the cyclopean fabric near Argos known by the name of the Treasury of Atreus, are generally dome-shaped, and the central apartment is lighted through an aperture in its vault. Other points of resemblance to cyclopean masonry may be found in the doorways
to these subterraneous galleries and apartments, which are
to the lake of Tacuare. The heat and humidity of the
climate, especially on the south and southeast, near the
south-eastern angle is Mount Ystoa, which is 1,579.4
above the sea-level, and is always covered with snow.
It is connected by a ridge with Mount Popocatopill, which
lies farther south, and attains the height of 17,984 feet.
The surface of the lake itself is intersected by very irregularly shaped rocks, which are
time isolated and sometimes in groups singularly
arranged. The most elevated are the Cuesta de Barrento,
north of the town, which rises 24 feet above its base; and
the Cuesta de San Isidro, which rises 1025 feet above
the lowest part of the lake. The dis-

Mexico is one of the finest cities in the world. In the dry
season it is at some distance from the lake of Tacuare, whose
waters in the rainy season are sometimes driven by easterly
winds to the eastern border of the town, which is protected
against inundations by dikes. The streets are very wide,
and at right angles to each other, so that by looking down
any two at the point where they intersect each other, the
spectator is presented with a view of six streets. The streets
are all well paved, and have side-walks of flat stones. The
private houses, though spacious, are rather low, seldom ex-
ceeding one story; but being constructed either of masonry
or of wooden beams, they have an air of solidity and even of mag-
nificence. The houses of the small and medium-sized
private buildings are owing partly to the difficulty of laying
a good foundation, as water is uniformly found at a very few
feet from the surface, and partly to the frequency of earth-
quakes. In consequence of the water all the larger build-
ings are raised upon piles. The roofs of the houses are flat,
and as they sometimes communicate with one another for a
considerable distance, when seen from an elevation they
look like immense terraces. The houses are all squares,
divided open courts, which are surrounded by corridors.
The entrance leads through the court, and the stairs are opposite to the gate. The best apartments,
which are generally painted, are towards the street, and all
the windows are ornamented with balconies.

The streets of the north are surrounded by buildings of hewn stone in a good style of architecture.
The principal square is the Plaza Mayor, which, on two
sides, is surrounded by the cathedral and the palace, and
on the other two sides by shops and dwelling-houses, with
some public buildings. The plaza is 320 by 320 feet, and
is 70 feet above the level of the Sea. In the centre of the
plaza is a magnificent equestrian statue of Charles IV. of Spain, which has been removed since the Revolution. This square is the market
for vegetables and fruits, those of the south of Europe being
cultivated in the immediate neighborhood, and the fruit
of the tropics are brought from the plain of Cuauita Amili-
and from Isla. [MEXICAN STATES]. Manufactured
goods are sold in the Portales, or covered colonnades, of
which there are several on a large scale, and all well sup-
plied with water. In the center of the square is a large public
pal shops open into the Portales, and innumerable petty
vendors display their wares, crowded on tables, in boxes
and in baskets. The Parian, or bazaar, is a square building,
divided into uniform compartments by two principal
cross-streets, and others subdivisions. The plaza mayor
was the viceroy formerly was lodged, and at present serves
as the residence of the President of the United Mexican
States, and also contains the senate-house and all the prin-
cipal public buildings. On the south of the plaza, and
a number of squares and inner courts with separate stair-
cases and suites of apartments. One of these courts
contains the botanic garden, which however has been much neg-
lected of late. The College of Miners is a large edifice, built in
pure Italian style, and it is surrounded by a wall which
hardly fifty years ago, is falling to ruins, owing to some
defect in the construction. It contains a rich collection of
minerals, and one in its rooms a professor gives lectures on
chemistry and mineralogy. The Acordada, or great
prison, is a substantial and large building, which will con-
tain above 1200 prisoners. The hospital, now converted
into artillery barracks, occupies a large site, and is well
built. The university building is not distinguished by taste
or magnificence; it contains a collection of Mexican anti-
cuites, and of the arts of painting and sculpture. The
Academy of Arts, which is a fine building, contains a
great collection of models, with casts of all the best statues
of ancient and modern times, and a school for drawing.

The royal churches and convents with their cupolas and
steeples give the town a magnificent appearance. The
the cathedral stands on the ruins of the g.eat teocalli, or temple,
of the god Mixtili. One part is low and of bad Gothic ar-
chitecture; but the other, built in the Italian style, is very
fine. The woodwork of the churches and of the monasteries
is very elaborate. In the outer wall of this church is fixed the heli-
old, a circular stone, covered with hieroglyphic figures, by which
the Aztecs or Mexicans use to designate the months of the
year, and which is supposed to have formed a perpetual
calendar. Among the numerous convents that of San Fr.
isco is distinguished by its extent, architectural beauty,
and wealth.

The Alameda, or public walk, at the western extremity of
the town, resembles a park: it is laid out in lines, diverging

Depleted by Google
from different centres, and is planted with a great variety of trees. In the centre is a fountain, which is supplied with water from the great aqueduct leading from S. Pé to the city. The water is carried along in trenches, so as to water the plants and trees, and is then discharged into the lake of Tescuco. As the ground on which the city stands is low, all the roads leading to it are raised six or eight feet above its level; they are broad, paved in the middle, and planted on both sides with double rows of trees. These roads, called calles, afford delight.

As the water of the lake of Tescuco is even saltier than that of the Baltic, according to the experiments of Humboldt, and as the water which is found a few feet under the surface is frequently brackish, the water is purified by the fresh water brought down by two aqueducts, which bring it down from springs situated in the mountains west of the valley. The larger aqueduct, leading from S. Pé to the Alameda, and thence to the lake, is 11,155 yards long, and in one third of its course is supported by arches of stone and brick plastered over. Its water, which is very pure, is distributed through the city. The other aqueduct, that of Chapultepec, is 3608 yards long, and rests on 904 arches, which are nine and a half feet apart, and the columns four feet thick. The width is 70 feet. The Gulf of Mexico, off the coast of a mean, is united to the Caribbean Sea by a strait about 120 miles wide, which is formed by Cape S. Antonio, the most western extremity of the island of Cuba, and Cape Catoche, the most northern point of the peninsula of Yucatan. The southern part of the Gulf of Mexico, along the southern coast of Yucatan, is more than 1000 miles, and its breadth towards the west more than 700 miles; but between Yucatan and Cuba, on the south, and the shores of Louisiana and Alabama, on the north, it does not exceed 70 miles. Shoals and small islands are everywhere within the body of the sea, and occur only along the northern coast of the island of Cuba and along the peninsula of Yucatan. Along the coast of Mexico the soundings are very regular, beginning at a distance of about 30 miles from the shore, and decreasing gradually as we approach the shores. At the eastern extremity, where the Gulf terminates in the old Bahama Channel and Florida Strait, the navigation is rendered very intricate by the Flore Island Reef, the Key Sal Bank, the Great Bahama Bank, and the numerous key shoals, and islets which surround the northern coast of Cuba.

The eastern trade-winds prevail in this sea during the summer from May to November, and on its eastern border along the islands all the year round. But along the coast of Mexico the trade-winds are of the greatest importance to the inhabitants. The winds from December to March, and sometimes last to the month of April. This wind blows in violent gusts and is attended with rain, but does not appear to extend beyond 12° 30' N. lat., to the north of which parallel the trade-winds always blow. The winds may be much interrupted by moderate winds from the east, which commonly last three or four days. At the end of March, and before the larger vessels, which cannot enter the shallow harbours of this coast, are obliged to ship their anchors and leave the shore.

The currents in this sea are mostly independent of this change of winds, and often set into the Caribbean Sea from the Atlantic, from the wide strait between the islands of Trinidad and Grenada it runs from one to one mile and a half a per hour, but not so quick in those which lie farther north, yet the current is about 50 miles farther as far as the islands of Dominica; it then diminishes gradually to ten and even eight miles, which latter rate occurs near the Virgins Islands. The strongest current within the Caribbean Sea is met with along the coasts of Venezuela and New Granada. The western coast of Venezuela and New Granada is farther west than the Atlantic, and as far as the Gulf of Venezuela, but west of that bay only from May to November. When the easterly wind ceases in November the currents begin to run to the westward some
in the month of April. But in the Gulf of Mexico, to the south-west of the Caribbean Sea, the order of the currents is inverted; they run westward from December to April, and eastward from May to November. These currents extend only about 20 or 30 miles from the shores, and in the eastern part of the sea they are always somewhat more strongly northerly, except in January and February, when they run with great force. This westward current turns northward in the strait between Cape S. Antonio and Cape Catoche, and carries the water into the Gulf of Campeche. This westward current runs along the shores of the northern part of the gulf, which are south of Cape San Agustin and Cape Corrientes, and returns to the Caribbean Sea.

The Gulf Stream carries the water back to the Atlantic. [ATLANTIC OCEAN.]

The Mexican Gulf may be entered by vessels through all the ports of the coast, except the Lesser Antilles from one another; but navigators prefer the straits between Trinidad and Grenada, and between S. Vincent and S. Lucie, when they sail to the northern coast of South America. Vessels bound to Jamaica, Cuba, Mexico, and Louisiana, commonly choose the strait between Guadalupe and Antigua; and rare sail through the Mona Passage between Porto Rico and Haiti. But most of the vessels returning from these countries to Europe sail through the strait between Cuba and Florida, and follow the Gulf Stream, until they have entered the Gulf of Florida Strait, when, turning eastward, they enter the Atlantic. Some vessels however, on leaving Jamaica and the countries farther south, direct their course to the Windward Passage between Haiti and Cuba, and thence to the Crooked Island Passage, by which they enter the Atlantic.

The Gulf of Mexico is remarkable for the high temperature of its waters. It raises the thermometer to 86°, while in the Atlantic, between the same parallels, the sea does not exceed 70°. This high water temperature is commonly ascribed to the cause of the high temperature which the waters of the Gulf Stream preserve a great distance from the Straits of Florida. In the centre of this sea, between the northern coast of Yucatan and the shores of Louisiana, great quantities of sea-water are rising in the Gulf Stream, which it is supposed originate in the warm waters of the Sargasso Basin. It was formerly supposed that the enormous quantity of this plant which is found in several parts of the Atlantic [ATLANTIC OCEAN] was derived from this sea, and that it had been brought down by the Gulf Stream; whence it obtained the name of Gulfweed; but at present it is thought that this plant grows on the bottom of the sea, in those parts where it is met with, and that at certain seasons it is detached from its root.

(Humboldt's Personal Narrative, &c.; Rennell's Invert.-

cation of the Currents, &c.; Ullms's Voyage to South America; and Lyons's Journal of a Residence and Tour in the Republic of Roray.)

JAMES, was born on January 7, 1491, at Vitel, a village near Bailleul in Flanders, from which place, agreeably to the custom of his time, he took the name of Balioianus. After acquiring the knowledge of ancient languages, he came to Paris, and went through a course of philosophy. Soon after returning from Paris, he entered the order of Saint John, he removed his school to Bruges, and finally renounced it to accept the cure of Blankenburgh, where he died on the 3d of Feb.-

uary, 1522. His remains were carried to Bruges and interred at St. Donatus. His principal works are: 'Flan-
decum,' containing the origin, antiquity, nobility, and genealogy of the counts of Flanders; 'Bruges 154, 440; and 'Garrancro Flandry, ab anno Christi 435' ad annum 1278,' Nürnberg, 1538, 4to. "Chronicles of Flanders, from the year 445 to the year 1278,' which was continued by his nephew to the year 1476, and published under the title of 'Annales Rerum Flandriae,' Antwerp, 1561, for which the sea they are also as the bars which lie before the embouchures of the rivers. Near the mouth of the Mississippi river, the northern current turns eastward, and afterwards to the south-east. At the western extremity of Florida Reef the current divides; the greater portion of the water, turning eastward, forms the Gulf Stream; while the remainder, running westward along the western side of the province, winds about the coast of Florida, and Cape Corrientes, and returns to the Caribbean Sea. The Gulf Stream carries the water back to the Atlantic. [ATLANTIC OCEAN.]

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and 4° 44' E. long.; 121 miles in a direct line north-east of Paris, or 144 miles by the road through Soissons, Reims, and Reîthel.

The town is chiefly remarkable for the strength of its fortifications. In 1529 or 1531 it was successfully defended by the Chevalier Bayard against an army under the count of Nassau, sent by the emperor Charles V, to besiege it. It was taken by the Prussians in 1813, after sustaining a long and stubborn resistance.

The town is built on the slope of a hill, and is washed both on the north and south sides by the Meuse, which here makes a bend to the west, in the form of a horse-shoe. The houses are ill built, and the public buildings little remarkable, with the views of the city from the churches, an observatory, and a theatre. Altogether the town suffers by the contrast between it and the neighbouring town of Charleville, which is to the north of it, separated only by the Meuse, and is larger and more regularly laid out, and better built than Mézières. [CHARLEVILLE.]

The population of Mézières, in 1831, was 3737 for the town, and 3759 for the whole commune; in 1836, it was 4083 for the commune.

The inhabitants manufacture leather, which is in high repute, and carpenters and other mechanics' tools: there are some breweries, and the quality of its ale is high, and linen cloth. Building stone, lime, and sand are abundant round the town. There are three yearly fairs. There are some fiscal and administrative government offices here and at Charleville. There are a society of agriculture, several schools, a public library, and institutions for instruction in geometry and mechanics applied to the arts.

The arrondissement of Mézières has an area of 363 square miles, and comprehends 99 communes. It is divided into two sections or districts, each for justice and posts.

The population, in 1831, was 62,737; in 1836, it was 69,294.

MEZZOTINT, in engraving, a peculiar mode of engraving designs of any description upon plates of copper or steel, by means of blowing air through an open network, or through a fine network of wires, which enables the workman to pass over the plate in almost any number of directions without repeating any one of them. The mezzotint ground being thus laid, it is at this stage a number of strokes, hatches, or points, made with the Having traced or drawn, with a pencil or other instrument, his outline upon the paper (unless indeed, as is sometimes the case, this should have been etched by the ordinary process, previous to the mezzotint ground having been laid), i.e., proceeds to excise away the man or ground, in conformity with the design, from all those parts which are not intended to be perfectly black in the impression. The instruments required for this purpose are scrapers and burnishers; with the former the sweaters scrape away more and more of the ground in which the lines are engraved; and it is requisite that the burnishers are used to produce perfect whiteness where it is required, as the light hights on the forehead or tip of the nose, or white linen in a portrait, &c. As the work proceeds it may be by obtaining impressions by the friction of a printer's ball or otherwise, to ascertain the effect; after which the scraping may again be proceeded with, the artist taking care always to commence where the strongest lights are intended to appear.

The method by which mezzotints are executed, as compared with line-engravings, will be obvious, seeing that it is much easier to scrape or burnish away parts of a dark ground corresponding with any design sketched upon it, than it is to form shades upon a white ground by an infinite number of strokes, hatches, or points, made with a graver or etching-needle. Herein consists the leading difference between this and all other modes of engraving; for while the process in each of these is invariably from light to dark, in mezzotinto it is from dark to light; and even the very deepest shades are produced, as we have seen, before the design is commenced. The characteristic or distinguishing excellence of mezzotinto engraving would seem to consist in the rich profoundness of its shadows, the obscurity of which especially sympathises with fine effects of chiaroscuro. It is therefore properly employed upon subjects where the quantity of dark predominates, as in the works of Rembrandt and Rubens; and there can be little doubt that, had this process been known to that great master, he would have availed himself of it in multiplying his works. This opinion is sufficiently corroborated by the fact of his having sought and obtained the same effect, or nearly so, by leaving off strokes or printings [ETCHINGS], which, retaining the printing ink, through a limited number of impressions at least, produced a result so nearly corresponding with mezzotinto, that many persons have been deceived by it, and led to attribute to Rembrandt van Rijn the discovery of this more modern mode of procedure.

Having mentioned what we conceive to be the characteristic excellence of mezzotinto, viz. the richness and procumbency of its shadows, it is but fair to add that its chief defect seems to be a corresponding poverty in its lights; and this objection will be felt to have much weight, when it is considered that it is to the lights in a picture that the eye is invariably attracted. On the lights therefore the line-engraver of old times never spared to use all the delicate incisions which agreeably irritates the eye and compensates for the absence of colour, by rendering the lights more interesting than the shadows. The lights in mezzotinto, on the contrary, as they occur in broad masses, have been ever felt by the judicious connoisseur for justice of the peace.

Of late however this objection has been much obviated by a judicious admixture of etching with the mezzotinto, which, by enriching the lights, has done much towards uniting the merits of both. Observation has also been taken to mezzotinto on account of the very limited number of good impressions which an engraving in this style would yield, in consequence of the very superficial nature of the ground. A work of this sort however was always susceptible of a new renovation by mezzotinting, under more easy and satisfactory circumstances than one produced by any of the other modes; and latterly the introduction of steel plates, which are now commonly substituted for those of copper, has removed the objection entirely, a very large number of good impressions being thus ensured, and the work requires retouching. As copper-plates however are still occasionally used, it may be proper to state the respective numbers of good impressions which each may be expected to yield. On copper, the wear of the plate much depend upon the number of etchings it has been principally used for, or the closeness of the teeth in the grounding-tool, the fineness of the grain depending upon these circumstances. If the grain be not particularly fine, a copper-plate will dismiss about one hundred and fifty prints. When the plate begins to wear, the practice is to work it over again, partially, with the etch; and afterwards again have recourse to the scrapers, and in this way impressions of fifty at a time may be taken; so that by alternately re-engraving and printing it, five hundred prints are frequently obtained from one copper-plate.

But from a steel plate eight or ten times that number may be obtained. The process is the same in the one case as in the other, but heavier pressure on the grounding-tool is requisite on the steel plate, and the number of etchings also is desirable, and these may be effected without rendering the subsequent engraving liable to more rapid deterioration, as would be the case upon copper. As many as ninety etchings are frequently used on steel, while the number on a copper-plate varies from twenty-four to forty, which latter is rarely exceeded. It is scarcely necessary to say that steel plates, being especially liable to rust, require particular care in laying by.

From what has been said, it will be inferred that the manual operation of laying the mezzotinto ground is a very important, at the same time that it is a very laborious process. It is much to be wished that some means of effecting it by machinery may be devised; and the only reason to doubt that this could be accomplished with equal, or perhaps superior results to those obtained by the present mode of procedure.
The discovery of the art of engraving in mezzotinto has been a subject of some controversy, and, almost up to the time of our writing, of much uncertainty; but circumstances have recently transpired which we are among the first publicly to announce, and which, we think, set the matter at rest. To give the honour of the invention to its real author, the rarity of whose productions has hitherto favoured the pretensions of one who has shown himself but too willing to strut in borrowed plumes. The account commonly given of the invention is, that one soldier engaged in cleaning from his musket the rust which the night-dew had occasioned, and perceived upon it, as he thought, some resemblance to a figure; it occurred to him whether or not, by corroding or grounding a plate, he might produce the same manner resemblance. He worked the rust, he immersed the plate not afterwards scrape away a design upon it, from which impressions might be obtained. In short, it is said that he tried and succeeded, and thus became the inventor of mezzotinto engraving. If mezzotinto really had its origin in such circumstances as these, which is far from improbable, they must have occurred to another rather than to Prince Rupert, since he was certainly not the discoverer of this art, as we shall presently show.

The merit of the discovery has been claimed by some authors (as is the case of a writer now living) for Sir Christopher Wren, on the ground of a communication which he made to the Royal Society in 1662, the Journals of which Society for October in that year record that 'Doctor Wren put by some some curious, which he by himself near, whereby he could almost as soon a design upon a plate of brass or copper, as another could draw it with a crayon upon paper.'

Previous to setting up the claims for Sir Christopher Wren, one of the most spirited and more spirited remarks which would have led his biographer to consult the engraved works in mezzotinto of Prince Rupert, which are not numerous, and, we believe, do not exceed twelve in number. He would then have found that his principal work, a 'Collation of Saint Peter' (a design by Spagnolotto) bears date 1658, which is four years earlier than Sir Christopher Wren’s communication to the Royal Society. In 1662, the year in which Sir Christopher Wren made this communication, the Royal Society was founded; and on the 28th of July the same year, John Evelyn (who was nominated by the king one of the original members, and of the council) published his 'Sculptura,' in which the first announcement of the new art, in England at least, appears; and in which, among other inculcations for the use of Prince Rupert, in a chapter on the new method of engraving, or mezzotinto, invented and communicated by his highness Prince Rupert, count palatine of Rhine.' He embellishes the chapter with a specimen from the present engraving, and concludes it by alluding to the credit of the process, on which he is 'preparing to be reserved in the archives of the Royal Society;' and, as we have already seen, Prince Rupert’s most capital performance actually bears date four years earlier: so that there is no pretence for giving the invention to Sir Christopher Wren on the ground of anything which he produced, or any communication which he may have made in 1662.

But while we have thus shown that the pretensions of Prince Rupert completely supersede those of Sir Christopher Wren, it remains for us to take notice that those of Prince Rupert himself are invalid, and that he was guilty of an act of meanness in imposing upon John Evelyn, and this to the extent of allowing a man of his high character to impose on him, whenever he was engaged in the business of the world, by claiming for Prince Rupert the honour of an invention to which the prince well knew all the while that he had title.

The real inventor of this art was Louis van Siegen, a lieutenant-colonel in the service of the Landgrave of Hesse-Cassel. Prince Rupert paid him visits in Holland, and brought it with him to England, when he came over a second time in the suite of Charles II. Some curious and very rare prints recently purchased on the Continent, and now deposited in the British Museum, will enable us to place the claims of Van Siegen beyond doubt.

It is true that the Baron Heneiken long since ascribed the invention to its true author; and in his 'Histoire Générale d’une Collection Complet de Estampes,' printed at Leipzig in 1711, he distinctly asserts that Prince Rupert learnt the art of mezzotinto from Van Siegen, whose etchings 'public were a portrait of the Princess Amelia Elizabeth of Hanover. But although Baron Heneiken is an author of acknowledged credit, we must have continued to speak with caution on the subject, because we believe Baron Heneiken does not give the date of this engraving, nor provethat he has grounded his assurance on the very mezzotinto ever lately purchased for the British Museum there is an impression of this identical portrait, and it bears date 1643, which is fifteen years anterior to the earliest of Prince Rupert’s dates. In the same collection there is another mezzotinto of the same lady, by Charles van Stalpaert, the date of which is also 1642, which we think places the question beyond all dispute. But there is among them one specimen which we regard as more curious than any of the others; for although without a date, it bears, we believe, the seal of Prince Rupert himself. The mezzotinto is produced in the most infamously, since it exhibits a total misconception or misapplication of its peculiar local powers, which, as we have said, are especially calculated for large masses of shadow of an indeterminate character, such as a plain has around to a portrait. Now to the work which we allude, which is a portrait of the princess of Orange the eldest daughter of Charles I., is a mixture of line-engraving and mezzotinto, and in it the background (which, if the date be 1642, would be the work of Van Siegen, or of some one of his pupils) is performed wholly in cross-hatches by the old process; while the flesh and even the hair, in which line-engraving might have been applied with advantage, are produced wholly by the new process of mezzotinto. We think the head, therefore, is certainly a production of Van Siegen, and also probably learnt the art from Siegen, which bear date 1656, being earlier than anything by Prince Rupert; but the works both of Fürstenburg and Prince Rupert are engraved entirely by the newly discovered process of mezzotinto, and have none of the indications of the powers of those than its inventor Van Siegen.

We will only further add the remarkable fact that Van Siegen frequently attached the word 'inventor' to his works, of which we subjoin an instance in the inscription of one of his latest performances: 'Eminentissimum Principi Domino D. Julio Mazzarini, S.R.E., Cardinalli, et., novus Sculpturae modi primum inventor Ludovicus Siegen hunc ingenium offert, dicat et conscet. A.D. 1657.'

It is not possible to be more than half of the truth which we have said, that Prince Rupert, by himself or with the assistance of Wallerant Vaillant, an artist whom he retained in his suite, may have improved the mechanical mode of laying the mezzotinto grounds; but that the invention of the art itself, with all the powers of this of mezzotinto, is to be ascribed to Van Siegen, who produced many of his works about A.D. 1672.

It is in our own country that mezzotinto engraving has been ranked in the greatest perfection. To English artists previous to the present century were James Macardell, Richard Houston, Valentine Green, Dixon, the two Watsons (Thomas and James), and one who contributed more perhaps to the improvement of this art than any one else, Richard Earlom, whose name, embracing almost every class of subject (history, portrait, still life, &c.), are well known, and are in every collection of importance in the country.

M.I. [SIR. [HINDUSTAN, VOL. XII, P. 211.]

MIAMI [Ohio.]

MIASMA is a Greek word (μιάσμα) signifying pollution or corruption generally; and is employed to designate a certain volatile deleterious principle, arising either from the natural elements of the earth, or from the secretions of the body, or from the earth, and capable of exerting a morbid influence on those exposed to its action. To the terrestrial emanations the Italians have given the name of Malaria (from malaria, an old word, and to be derived from the sick, the term contagio is more properly applied). In common parlance, therefore,“There is seldom employed to designate the contagious effluvium of disease; but, with the adjuret marsh, is restricted to the sense in which an opinion is held that the sick speak of it to their friends, and malaria as one and the same thing. Though marseas,
whether salt or fresh, are prolific sources of malaria, they are by no means the only sources; the mud which is left by the drying of extensive ponds and lakes, the half-wet ditches of fortifications, and neglected sewers and ditches, are capable of furnishing this poison. The decomposition of vegetable matter, in other circumstances than in connection with soil, is likewise capable of producing it; this has been experimentally proved in ships from the leakage of sugar into a damp hold. The feverish state of the secretions in the fever-ravages among the crew of the Pramias frigate, arose from the action of bilge-water on chips and shavings left in the hold. Having enumerated some of the sources of miasma, the question naturally presents itself, what are the essential solutions to its development? The mere name of marsh miasma suggests the idea of stagnant water, and if the preceding enumeration of circumstances under which the production of miasma takes place be examined, it will be found that water and mud are present in all the examples, and that animal matter is so occasionally. But how great a seoyer may be the share which moisture has in its production, it is certain that only a very small proportion is necessary: a marsh, the whole surface of which is then dry, even, is completely innocuous; but if partially or entirely dried by the summer's heat, it becomes extremely pestilential in autumn; indeed malaria, in its most intense degree, has been met with in low lands which had become as dry as a brick ground, with the vegetation utterly burnt up. In the case of a marshy area, the degree necessary, or at least favourable to its development. According to Dr. Ferguson, the only condition indispensable to the production of marsh miasma on all surfaces capable of absorption, is the paucity of water where it had previously recently resided; the matter and moisture are present in all the examples, and one which the present state of our knowledge does not enable us to answer. The occasional existence of putrefaction in conjunction with malaria is an accidental concomitant, but by no means essential to its activity as a poison, for the effects of the miasma in a marshy area are most often observed in a longer or shorter period after exposure to its influence, and consist chiefly in the production of intermittent, remittent, and yellow fevers, dysentery, and typhus. The long-continued application of the same poison to a marshy spot, is, for the most part, a consequence of the local condition of the ground, the absorption of the matter, and the extension of its influence.

MIAZZI, GIOVANNI, an Italian architect of the eighteenth century, born at Padua in 1699, was originally brought up to his father's trade of carpenter. He was almost entirely self-educated in the profession which he afterwards followed; for it was not till he was forty that he availed himself of the instructions of Preti, who was his master by two years. He had however previously built a small theatre in his native town, and the church of La Trinità in the Borgo of Angarone. One of his later and best works is the church of S. Giambattista a Bassano, in which he thoroughly expressed the baroque style, and carried it out of the site and the conditions he was obliged to comply with. He also built the collegiate church at Schio, that at Valdagnino, another at San Vito, and a fourth at Simonzio, besides that at the convent of Monte Gargano, in Puglia. The buildings where executed by the technical regulations which had been established much admiration for the elegance of its design, which has since been greatly impaired by the demolition of the chapel and corresponding wing, and the arcades uniting them to the central edifice. The beauty of these buildings is not in its exterior, but in the original design produced from Bibbiena, he greatly improved it; and the façade, the vestibule, and many of the internal arrangements are entirely his own. Miazz died about 1746, and, notwithstanding his age, continued vigorous and active to the last.

MICA. [Leptolite; Margarite; Oderit.] MICA SCHIST, one of the earliest groups of strati-
Theo, is called in the title to his prophecy the Micaiah, and thus is he distinguished from Micaiah, the son of Imlah, who prophesied the death of Ahab, about a.c. 897. (1 Kings, xxii. 8-28.) This appellation was probably derived from his birthplace, Moresbeth-Gath (Micaiah, i. 14), or the street in which it was situated, the street of Judah. (Micaiah, i. 15; Josh., xi. 44; 2 Chron., xi. 8; iv. 9-10.)

From the title of the book of Micaiah we learn that he prophesied in the days of Jothiam, Ahaz, and Hezekiah, kings of Judah, or from 749 to 699 B.C. The kings of Israel under whom he prophesied were Jothiel, and Uzziah, kings of Judah, and Isaiah, the son of Amoz, was the prophet of Judah. (Micaiah, iii. 12,) and says that it was uttered by Micaiah in the days of Hezekiah. He must have delivered his prophecies before the sixth year of Hezekiah (a.c. 722), in which the kingdom of Israel was destroyed, for he speaks of that calamity as a future event. (Micaiah, i. 6, 6.)

Hartmann contends that Micaiah prophesied after the fourteenth year of Hezekiah, and that the book which bears his name is a collection of different prophecies made during the reigns of Hezekiah and Zechariah, some of which belong to Micaiah, and others not. (Micaiah, new übersetzt und erläutert, Lemgo, 1800.) This hypothesis, which is totally at variance with all the testimony we have on the subject, and is not sustained by internal evidence, on which it professes to be founded. (Emil Frey in Jer. 16, p. 430, and Rosenmüller, Schriften in Vet. Test., Proem. in Mic.)

Micaiah prophesied both to Israel and Judah (i. 1). He begins by predicting the overthrow of both nations, upbraiding them with their iniquity and injustice, and includes this part of the book with the striking prophecy of the destruction of Jerusalem, which Jeremiah quotes, and which some suppose to refer to the taking of the city and the burning of the temple by the Romans. (chs. i., ii., iii.) He next prophesies the restoration of the people to Jerusalem (iv. 1-8), after they have been carried captive to Babylon (iv. 9, 10), and the destruction of their enemies (iv. 11, 13). He foretells the birth of the Messiah at Bethlehem, after great calamities (v. 1-3), his ministry, and final triumph (v. 4-15). In chap. vi. he again reproves the people for their ingratitude, injustice, and injustice. In chap. vii. Jerusalem is represented as complaining of the corruption and impiety of the kings, but patiently waiting for deliverance from God (ver. 1-10). The prophet consoles her with the promise of her restoration (ver. 11-13), and concludes his book with a sublime prayer to God for the fulfillment of that promise (ver. 14-20).

This shows Bishopbrightness, is for the most part close, forcible, pointed, and concise, sometimes approaching the obscurity of Hosea, in many parts animated and sublime, and in general truly poetical. (Prolect, xxii.)

The canonical authority of this book is undisputed. One of the most remarkable predictions in it (v. 2) is quoted in the New Testament as being understood by the Jewish priests and scribes to refer to the birth of the Messiah. (Matt., ii. 5.)

(2) Rosenmüller's Scholia in Vet. Test.; the Introductions of Eichhorn, Bertholdt, Jahn, De Wette, and Horne; The Minor Prophets, by Newcome and Horsley; Micaiah, übersetzt und erläutert, by K. W. Justi, Leipzig, 1820.)

B. A. L. M. [Coomill]

MICHAEL, SAINT. [Anotes]

MICHAEL, JOHN DAVID, was born at Halle on the 27th of February, 1717. His father, Christian Benedict Michaelis, was professor of theology in the university of Halle, and a distinguished Hebrew scholar. After receiving instruction from his brother, and from Michaelis, he spent four years in the orphan school at Halle, where his attention was particularly directed to languages and philosophy. In 1733 he began to attend the lectures at the university, and it was here that he obtained from the chancellor Ludovig's lectures on German history the foundation of that knowledge of general law and of the constitution of society which was afterwards displayed in his Miscellanea Rhetor. After taking his degree in 1740, he visited England, where he made the acquaintance of several eminent scholars both in London and in Oxford. During part of his residence in England he preached at the German chapel in St. James's Palace. On his return to Germany he devoted himself to the study of history, Oriental languages, and biblical criticism. At the death of the chancellor Ludwig, Michaelis was commissioned to arrange and catalogue his immense library. The catalogue was published in 1743, and is considered a model for such works.

In 1745 he went to the university of Göttingen at the invitation of Münchhausen; and there he spent the rest of his life, although he was invited by Frederick the Great, in 1763, to take the chair of languages at Berlin. Michaelis rendered the most important services, as professor of theology and Oriental literature from 1745 to 1791; as secretary and director of the Royal Society of Sciences, from 1751 to 1776, when he left it on account of some differences with the members; as editor of a work entitled 'Gelehrte Anzeigen' from 1733 to 1770, and as librarian and director of the philological seminary, which would have been abandoned after the death of Gremer in 1761, if Michaelis had not consented to direct it gratuitously.

In order to throw new light upon biblical science, Michaelis planned the expedition to Arabia and India which was conducted by Carsten Niebuhr. The first project was the voyage of four ships under the command of the Baron von Bornstoff, then minister of Frederick V. of Denmark. The choice of the travellers was entrusted chiefly to Michaelis, who drew up a series of questions for their guidance.

In 1761 Michaelis was made a knight of the Polar Star by the king of Sweden; in 1786 he was appointed an Aule counsellor of Hannover, and in 1789 he was elected a Fellow of the Royal Society of London. He died on the 22nd of August, 1791. He was twice married; by his first wife he had only one son, Christian Freuden; by his second he had nine children, of whom one son and three daughters survived him.

The mind of Michaelis was strongly characterized by intellectual benevolence. He always acted in the spirit of his motto 'libera veritas.' But his love of humanity made him to undervalue the labours of other learned men, and to do injustice to some of his most distinguished contemporaries. He often appeared to delight in discovering difficulties solely that he might have the pleasure of removing them. In the examination of the Old Testament he treated the Masoretic traditions with a contempt hardly less extravagant than the reverence entertained for them by the school of Buxtorf; and in every department of criticism he was apt to make single handed, and sometimes to overdo the real evidence. Though a good Hebrew scholar, he never possessed an accurate knowledge of the classical languages, and his acquaintance with Arabic was superficial. Notwithstanding these defects, his contributions to biblical and Oriental researches were invaluable. A great number of subjects capable of illustration from history and philosophy. His religious opinions were never firmly fixed, but he invariably expressed the greatest reverence for the Scripture

The works of Michaelis are very numerous; the following are some of the most important. In Oriental literature, grammars of Hebrew, Chaldee, Syriac, and Arabic, and treatises on various subjects connected with these languages: Oriental and Exegetical Library, 74 vols. New do. 8 vols. 'Supplements in Lexica Hebraica,' 6 vols. In philosophy, an essay 'On the Influence of Opinions on Language and of Language on Opinions,' which obtained a prize from the Russian Academy of Sciences in 1759; a treatise on moral philosophy; and other works on grammar, chronology, 'Scripium Geographie Hebraeorum externe post Bochartum'; other treatises on geography and chronology; several separate dissertations on the laws and antiquities of the Jews, the substance of most of which is embodied in his 'Miscellanea Rhetor.' Michaelis was the second editor of the first 5 vols. of this work was published in the years 1775-80. This work, which is considered the masterpiece of Michaelis, was translated into English by Dr. Alcibiades Smith, in 4 vols. 8vo., 1814, under the title of 'Commentaries on the Laws of Moses.'

The great object of Michaelis in this work is to investigate and illustrate the philosophy of the Moses laws, to show their wonderful adaptation in every respect to the very peculiar circumstances in which the people to whom they were given had been placed by providence; and, while he
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In the favourable circumstances in which he was latterly placed, and which, if Milan, bestowted upon him, he would have distinguished himself among the writers of the close of the eighteenth century. The productions he left are to be considered merely as the blossoms of poetical talent. The principal ones among them are his satires, fables, and tales, and poetical epistles; and they afford proof not only of literary talent, but of the excellence of his moral character.

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about 30 miles. Lake Erie washes the eastern shores of Michigan for about 40 miles. In the south the peninsula is divided by an imaginary line from the states of Ohio and Indiana. The boundary-line of Ohio runs along 41° 35' N. lat. for about 80 miles, and that of Indiana along 41° 34' N. lat. for about 110 miles.

Surface and Soil.—The interior of the peninsula forms a plain which has generally a level surface, but in some districts is undulating or intersected with low hills. This tract is probably about 200 feet above the lakes, and the surface of the soil is an accumulation of loam, which, though the water table is at 90 feet above it, the highest land seems to traverse the peninsula towards its southern extremity in a south-west and north-east direction, forming the long arm of the peninsula to the smaller peninsula of Sanilac. The surface of this part is more undulating than other parts, and intersected by a great number of small lakes. The soil is said to be rather fertile. The slope of this high land towards the lakes Erie and St. Clair, and the straits of Detroit and St. Clair, is long and hardly perceptible. This is probably the most fertile district of the country; it contains little prairie land, except on the alluvial tracts near the mouths of the rivers and along the lakes, which are in some parts marshy but fertile, and generally produce a considerable portion of the corn and other crops covered with trees of a heavy growth. The slope towards Saginaw Bay along Saginaw river and its numerous branches is of a similar character: but the peninsula of Sanilac has a poor soil and is mostly sandy. The larger peninsula, terminating in Lake Michigan, is less known, and is, however certain that it contains no mountains, nor even high hills. A great portion of it is prairie land, intersected with numerous swamps, at least in the southern districts which have been explored. The shores of both the great lakes have many small mouths or bays, which descend to the shore of Michigan there are sandy eminences, formed near the mouths of the numerous small rivers which join the lake, by the action of their current against the swell of the lake: these are of very inferior fertility and value. No lake of the United States is, however, of so great an extent of government, and contains about 3000 inhabitants mostly of French origin: it also is the principal deposit for the cinder, grain, and fur, which are sent from this place mostly to the social value and utility to them, and also carries on a considerable trade with the Indians Mackinac, or Mackinaw, on the island of Michilimackinac (about nine miles in circuit), contains about 100 houses, and has a good harbour. It is the great place for the Indians both for the sale of their furs, and for receiving the annuities paid them by the United States.

There is daily communication by steam-boats between Detroit and Buffalo in New York, a distance of about 24 miles. Many of the oldest inhabitants are of French extraction, but the proportion of the population consists of emigrants from New England.

History.—Early in the seventeenth century the French penetrated into this country from Quebec. In 1679 they founded Detroit. In 1763 Michigan was included in the British United States, and was given up by the British until 1805. In 1805 it was formed into a territory.

(MICIPPA. [Median, vol. xiv., p. 300.]

MICKLE, William, was born in the year 1734, at Langholm in Dumfriesshire, where his father was a Presby- terian minister. At the age of sixteen he was sent to the counting-house of a relation, who was a lawyer, and remained there five years. He afterwards set up business in his own account, but failed, it is said, because he devoted those hours to his practical studies, which should have been dedicated to business. He subsequently became a rector of the Clarendon Press in Oxford, and though sever- al of his works were unknown to the public till the publication of an elegy called "Polio," in 1765. This was followed in 1767 by a poem in imitation of Spenser, called "The Consub, per- Upon November and lasts to the middle of March. The ice on the rivers and waves of the lake is strong enough to admit travelling on sledges, though situated on both sides of 45° N. lat., its climate resembles that of southern Sweden (57° N. lat.). This circumstance is mainly to be attributed to the elevation of the surface, and also to its not being sheltered by any range of mountains against the cold northern and north-western winds which blow over the great plain that stretch northward to the shores of the Polar Sea. The surrounding lakes, though large, are still too small to moderate in any sensible degree the coldness of these winds. Lake St. Clair is subject to very great changes from December to February. The summers are never hot, but subject to considerable changes. In the hottest days the thermometer rises to 70°, but in the evening and morning it is as low as 46°. The climate is rather dry, and the quantity of snow which falls is considerable. The winds are generally from the north and north-west. The depth of water in different parts is most numerous. The wild animals are the elk or moose, deer, wolves, foxes, wild cats, otters, martens, raccoons, opossums, squirrels of different kinds, and musk deer. The bird life is also numerous, and includes all kinds which fall into Lake Michigan. Fish abound in the lakes and rivers, but not in Lake Michigan. Wild turkeys and pigeons are abundant.

Inhabitants.—There are few settlements of the whites north of the Wisconsin river. The Wisconsin river and the Saginaw river, as it flows from Lake Michigan to that of the Saginaw, the whole tract lying north of it is chiefly in possession of the aboriginal tribes of the Ottawas and Miamis, who, with some Potawatamis and Chipewas, have in some places villages within the range of the country inhabited by the descendants of the Europeans. These Indians generally cultivate maize, and some of them wheat and vegetables; they also raise horses, cattle, hogs, and poultry. The population of these tribes may amount to about 9000. That of the whites was estimated at 10,000 in 1836, and is now increased to about 31,670 souls, and according to an enumeration presented to Congress in 1834, it amounted to upwards of 60,000 within the limits of the proposed state, which is a greater relative increase than any other state or territory in the United States. There is a greater increase of the white people in the same time. There are a few coloured individuals.

Political Division and Towns.—The country settled by the whites is divided into 35 counties. The only place of importance is Detroit, which is chiefly from the influx of the waters of the Detroit river and separated from Lake St. Clair. It is the capital of the state, seat of government, and contains about 3000 inhabitants mostly of French origin: it is also the principal deposit for the cinder, grain, and fur, which are sent from this place mostly to the English. It is the principal port of the United States, and also carries on a considerable trade with the Indians Mackinac, or Mackinaw, on the island of Michilimackinac (about nine miles in circuit), contains about 100 houses, and has a good harbour. It is the great place for the Indians both for the sale of their furs, and for receiving the annuities paid them by the United States.

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(Darby's View of the United States; &c.)

MICHIGAN, Lake. [CANADA.]

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appointed commander of the Romney man-of-war, took him out to Lisbon, where he was appointed joint-agent for the prizes that might be taken in an expected cruise. His translation secured him much respect among the Portuguese, and he was admitted a member of the royal academy, of which Prince Don John of Braganza was president. A poem called 'Almada Hill' was a result of his residence at Lisbon. After Mickle's return to London with Governor John, the writer of both the prose and verse, the last of which was 'Eskdale Braes, a ballad. He died at Wheatley in Oxfordshire, in 1789.

His translation of the 'Lusiad' has been severely censured on account of the liberties taken with the original, and this is how there are two words in Greek and Latin, he is quoted as a whole are worth little, indeed so little, that we may wonder how they acquired the small celebrity which they have attained. A ballad by Mickle entitled 'Cammon-Hill' is not without merit; it furnished the idea of Sir W. Scott's 'Kenilworth' and is printed in the introduction to that work in the late complete edition of Scott's novels.

MICO, or Fair Monkey, one of the common names for that species of Ouastis (Hippale of Illiger) known to zoologists as the Jacchus argentatus, Geoff., Simea argentata, Lin. It is a medium-sized species, of the smallest of the genus. [JACCHUS.] The head is small and round, the face and hands of a deep fleshy colour; indeed the face and ears are of so lively a vermilion, that the animal, when in full health, looks almost as if it had been painted. The body is covered with long silvery-white hair, and the tail is of a shining dark chestnut, sometimes almost black.

MICROCEBUS, M. Geoffroy's name for a form among the Lemuridae; Lemur Galago Guineensis. Locality.—The region of the Bazar Parana.

MICRODACTYLUS, [Carilama.]

MICROGLOSSUS, [Prithacidae.]

MICROMETER, the term generally applied to contrivances for ascertaining very small spaces or angles with great accuracy or convenience. The word is not applied to such instruments for subdividing the graduations of an astronomical instrument (for these see VERNEY), nor when a magnified portion of a subsidiary arc is used. It is a general term for a revolution of the head of the instrument, and that of a series of gonioscopes (apparatus for separating the two wires given number of revolutions, and observing a series of transits of known stars over them. As large equatorialis are always carried by a clock movement, we should recommend fixing the position micrometer on the back of the clock, so that it may be set up, or down, or to the right or left can be given to the wires without meddling with the clock or the equatorial. With this apparatus the measurement of double stars is perfectly easy.

The micrometer requires illumination for seeing the wires, and the other parts, and for seeing the fine graduated lines and ill-defined objects. For a description of the position micrometer and its application to the measurement of double stars, see De Morgan's Companion to Maps of the heavens. Appendix.

The micrometer microscope, for reading off the divisions of graduated circles, depends upon the same principle as the wire micrometer. An enlarged image of the divisions of the limb of the circle is formed, and this image is measured by the revolutions and parts of a screw. [Circle.]

2. The divided object-glass micrometer and heliometer. If an object-glass be cut across so as to form two semicircles, and the semilenses be separated by sliding one beyond the other, each portion will form its proper image, and these will be divided on the same line. The semilenses are mounted on slides, and the quantity of separation read off upon a scale. In Bessel's heliometer, the most magnificent and most perfect instrument of this class, the focal length of the object-glass is eight French feet, and the apparatus is of the simple French type. The heliometer and plate will be found in the Astronomische Nachrichten, No. 189.

The only objection which can be made to this species of micrometer, besides the extreme difficulty of constructing it, is, that the stars are not seen so round and well defined as in the entire object-glass. The position of double stars are however, so far as we can judge, the most accurate that have yet been made. Suppose a double star to be measured with the heliometer: the whole of the object end is turned round, until four stars appear in a right line, and the semilenses are separated until the stars appear to be exactly at the same distance from each other.
the scale is read off. The semilenses are then shifted in a contrary direction, sliding the two images over each other, until they again appear to be at equal distances, and then the scale is again read off. The separation of the scale is four times the angular distance between the stars. There is a position circle, on which the direction of the stars is read off. In measuring the diameters of the sun, planets, &c., the two images never more to touch on opposite sides; and hence, in the observations of Halley’s comet it was made to coincide with the neighbouring stars. The divided object-glass micrometer is on the same principle as the heliometer: a cap containing the divided lenses is placed over the object-glass of the same similar micrometer, and the observer obtains the dividing one of the lenses of an eye-piece, and it seems probable that, with large telescopes, this micrometer may be of considerable use in measuring small angles. There is a good deal of colour in the images, but not at the point of contact. Micrometers of this class require no illumination.

3. Reticles and circular micrometer. The micrometers hitherto described are applied to the accurate measures of small angles; they are therefore, though very useful in certain cases, of much lower pretensions. The reticle, or diaphragm, as it is sometimes called, is any fixed arrangement of wires or bars which can be applied to a telescope for the purpose of measurement. They are chiefly used in nearly all kinds of observation, or by the astronomer who has no accurately divided instrument at his disposal, or, as in the case La Caille at the Cape of Good Hope, when the object is to fix approximately a greater number of stars than could be done in the same time with ordinary micrometers. Suppose in a case of a carefully cut out of brass-plate and inserted in the principal focus of a telescope with the axis of the letter in a meridian. A star passing through the field is occulted at its passage level to each of the bars, and the time which elapsed will show by an easy calculation, how far it passes from the vertex; and the mean of the times, the moment when it passes the axis of the diaphragm. If the true position of any one star so passing is known from any other source, all the stars will thus determine essentially with respect to it. The method is not very accurate, but may often be applied advantageously and with very small instrumental means. If a fine line be drawn perpendicular to the mean, and a bright star, observed with illumination, made to run along the wire, the axis of the diaphragm can be set in a meridian, and that is the only verification necessary. The computation in declination will be least if the angle between the bars is such that the base of the triangle is as short as possible. This reticle was also used in mapping, if placed in the meridian, or for cometary observation, if the telescope is mounted as an equatorial, however rudely.

The circular micrometer was introduced, we believe, by Olfers, and improved by Frauenhofer (Astron. Nachr., iv. 22), and is much less known and used in this country than it deserves. A metal ring is set in the centre of a perforated glass plate, and the outer and inner edge of the ring is turned true. The plate is fixed in the focus of a telescope, and the appearance is that of a ring suspended in the heavens. The telescope is pointed, and the observer notes the time when a star disappears at the outer ring, re-appears on the inner ring, disappears again, and finally re-appears. If two stars be thus observed, it is clear that when the observer at the commencement of the appearances of each, that the difference between the two means will be the difference of right ascension between the two stars, and therefore that if one be known, the other is determined. Again, if the diameter of the ring has been determined, and the declination of the stars nearly known, the time of describing the chord of the ring will give, by an easy computation, the distance of the chord from the centre, and that more accurately the smaller the chords used, or differences of right ascension, the smaller is the difference of the stars in declination. The computation of the second star with its approximate declination may be repeated if the stars are near the pole. It will be seen that nothing is required for the circular micrometer, but the power of the eye. The objects under this micrometer are sometimes seen at the distance of a known star passes the field, and that no illumination is required. It is especially the apparatus for determining the place of a faint comet or planet, and in the hands of Ollers, Harding, and many other German astronomers, has been of infinite use in cometary astronomy and in the discovery and observation of the small planets. When the comet has but a small spindle-shaped tail, the position of the tail is so low as to be required to attention to the difference of refraction, the comet is a little more complicated, but generally scarcely any computation is required, and the results, in right ascension at least, are good. The observations at the inner end of the tail are more accurate, and are to be preferred. When however the object will be illuminated and the astronomer possesses a telescope so mounted that he can apply a wire micrometer to it, the results from this are incomparably more accurate, and the observer will certainly better for determining declination. Frauenhofer afterwards (Astron. Nachr., iv. 43) proposed another ring and reticule micrometer. He cut a series of rings or lines upon a piece of glass which he placed in the principal focus of the object-glass, and then by a side limb estimated the rings, leaving the rest of the field dark. It is evident that for certain observations this micrometer would have great advantages.

There are many other micrometers, but they are not in such general use as to demand a notice here. The reader will find them very fully and elaborately described in Pearson’s Astronomy, vol. ii., p. 126 to 272 inclusive.

MICROPOGYN, M. Temminck’s name for a genus of Scouatorial Birds which has the general structure of Bucero, but the wings wider and short, the tail long and pointed, and the nails only gradually developed. Mr. Swainson arranges it under the ‘Bucero,’ or ‘Barbula,’ a subfamily of his Piducidae.

MICROPTerus, a name assigned by M.M. Quoy and Gaimard to a genus of Anadru, remarkable for the shortness of their wings.

Two species are recorded, viz. Micropterus brachypterus (Quoy and Gaim, Odzmemia Patagonica, King, Anna brachyptera, Lamb. Raceroom of Cook and Byron, and Strum-merack of Faidherbe), a King which is smaller in the body than the first, and is able to fly.

Description of the first-named species. Above lead-grey, inclining to grey; abdomen whitish; the beauty-spot on the wings white, at the bend a blunt spur; bill yellow.

Habits. ‘An extremely wonderful bird, the most remarkable bird of the Steamer-duck. Before steam-boats were in general use, this bird was denominated, from its swiftness in skimming over the surface of the water, the ‘racehorse,’ a name which occurs frequently in Cook’s Voyage. It is sought after for human food, and is the largest I have met with. It has the lobed hind toe, legs placed far backwards, and other characteristics of the oceanic ducks. The principal peculiarity of this bird is the shortness and remarkably small size of the wings, wher, not having sufficient power to raise the body, serve only to propel it along, rather than through the water, and are used like the paddles of a steam-boat. Aided by these and its strong broad-webbed feet, it moves with astonishing velocity. It would not be an exaggeration to state its speed at from twelve to fifteen miles an hour. It is the peculiar form of the wing and the short rigid feathers which cover it, together with the power this bird possesses of remaining a considerable time under water, constitute it a striking link between the genus Piduceridae and Anadru. It has been noticed by many former navigators. The largest we found measured forty inches from the extremity of the bill to that of the tail, and weighed thirteen pounds; but Captain Cook mentions, in his second voyage, that the largest this species measured thirty feet from the tip of the bill to end of tail, 40 inches; of bill, 3; of wing, from carpal joint to apex of second quill feather, 11; of tail, 5; of tarsi, 2. (King.)

Habits, Food, &c.—Captain Phillip Parker King, R.N., who has seen both species, one in the Zool. Journal, and the second in the Zool. Proceedings, first fell in with the larger species at Eagle Bay, beyond Cape San Isidro (Point Shut-up of Byron), in the Strait of Magallana. [Here, &c.—‘This might be the same species of bird which is often seen in small numbers, for some days, flying over the seacoast of Chile, and then make their appearance in large flocks on the Atlantic shore, when the freights of the vessels are landed, to which occasion they appear to be particularly attracted.’—(Quoy and Gaimard, p. 407.)]

The magnitude of the species above described is exceeded by that most remarkable bird the Steamer-duck. Before steam-boats were in general use, this bird was denominated, from its swiftness in skimming over the surface of the water, the ‘racehorse,’ a name which occurs frequently in Cook’s Voyage. It is sought after for human food, and is the largest I have met with. It has the lobed hind toe, legs placed far backwards, and other characteristics of the oceanic ducks. The principal peculiarity of this bird is the shortness and remarkably small size of the wings, wher, not having sufficient power to raise the body, serve only to propel it along, rather than through the water, and are used like the paddles of a steam-boat. Aided by these and its strong broad-webbed feet, it moves with astonishing velocity. It would not be an exaggeration to state its speed at from twelve to fifteen miles an hour. It is the peculiar form of the wing and the short rigid feathers which cover it, together with the power this bird possesses of remaining a considerable time under water, constitute it a striking link between the genus Piduceridae and Anadru. It has been noticed by many former navigators. The largest we found measured forty inches from the extremity of the bill to that of the tail, and weighed thirteen pounds; but Captain Cook mentions, in his second voyage, that the largest this species measured thirty feet from the tip of the bill to end of tail, 40 inches; of bill, 3; of wing, from carpal joint to apex of second quill feather, 11; of tail, 5; of tarsi, 2. (King.)

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particulars in natural history, without very good reason; but in this case I do think the name of “steamer” much more appropriate and descriptive of the swift paddling motion of these birds than that of “race-horse.” I believe, too, the name of “steamer” is now generally given to it by those who have visited these regions.

The same author informs us that Pecten vitrea, whose shell is found attached to the leaves of Fucus giganteus, together with other Mollusca, is the food of the steamer-ducks M. brachypterus and M. patagoniopus. *Narratives of the Surveying Voyages of H. M. S. Adventure and Beagle, vol. 1.*

MICROSCOPE, the name of an instrument for enabling the eye to see distinctly objects which are placed at a very short distance from it, or to see magnified images of small objects, and therefore to see smaller objects than would otherwise be visible. The name is derived from the two Greek words, expressing this property, *μεγάλωσις,* small, and *σκόπαω,* to see.

So little is known of the early history of the microscope, and so certain is it that the magnifying power of lenses must have been discovered as soon as lenses were made, that there is no reason for hazarding any doubtful speculations on the question of discovery. We shall proceed therefore at once to describe the simplest forms of microscopes, to explain their later and more important improvements, and finally to exhibit the instrument in its present perfect state.

In doing this we shall assume that the reader is familiar with the information contained in the articles LIGHT, LENS, ACHROMATIC, ABERRATION, and the other subdivisions of the science of Optics which are treated of in this work.

The use of the term *magnifying* has led many into a misconception of the nature of the effect produced by convex lenses. It is not always understood that the so-called magnifying power of a lens applied to the eye, as in a microscope, is derived from its causing the eye to approach closely, nearly to its object than would otherwise be compatible with distinct vision. The common occurrence of walking across the street to read a bill is in fact magnifying the bill by a microscope; and even our common eyes, at even such a distance, a change in the optical arrangement of his eye, to adapt it to the lessening distance between himself and the object of his inquiry. This power of spontaneous adjustment is so unconsciously exerted, that unless the attention be called to it by circumstances, we are totally unaware of its exercise.

In the case just mentioned the bill would be read with eyes in a very different state of adjustment from that in which it was discovered on the opposite side of the street, but no impression of this fact would be impressed upon the mind. If however the supposed individual should perceive on some part of the paper a small speck, which he suspects to be a minute insect, and if he should attempt a very close approach of his eye to the speck, verifying his suspicion, he would presently find that the power of natural adjustment has a limit; for when his eye has arrived within about ten inches, he will discover that a further approach produces only confusion. But if, as he continues to approach, he were to place before his eye a series of properly arranged convex lenses, he would see the object gradually and distinctly increase in apparent size by the mere continuance of the operation of approaching. Yet the glasses applied to the eye during the approach from ten inches to one inch, would have done more objects, because the lens done by the eye itself during the approach from fifty feet to one foot. In both cases the magnifying is effected really by the approach, the lenses merely rendering the latter periods of the approach compatible with distinct vision.

A very striking proof of this statement may be obtained by the following simple and instructive experiment. Take any minute object, a very small insect for instance, held on a pin or guammed to a slip of glass; then present it to a strong light, and look at it through the finest needle-hole in a blackened card placed about an inch before it. The insect will appear quite distinct, and about ten times larger than its usual size. Then suddenly withdraw the card without disturbing the object, which will instantly become indistinct as nearly invisible. The reason is, that the naked eye cannot see at so small a distance as one inch. But the card with the hole having enabled the eye to approach within an inch, and to see distinctly at that distance, is thus proved to be as decidedly a magnifying instrument as any lens or combination of lenses.

This description of magnifying power does not apply to such instruments as the solar or gas microscope, by which we look not at the object itself, but at its shadow or picture on the wall; and the description will require some modification in treating of the compound microscope, where, as in the telescope, an image or picture is formed by one lens, that image or picture being viewed as an original object by another lens.

It is nevertheless so important to obtain a clear notion of the real nature of the effect produced by a lens applied to the eye, that we will adduce the instance of spectacles to render the point more familiar. If the person who has
been supposed to cross the street for the purpose of reading a bill had been aged, the limit to the power of adjustment would have been discovered at a greater distance, and without so severe a test as the supposed insect. The eyes of the very aged generally lose the power of adjustment at a distance of thirty or forty inches instead of ten, and the spectacles worn in consequence are as much magnifying glasses to them as the lenses employed by younger eyes to examine the most minute objects. Spectacles and magnifying glasses to the aged because they enable such persons to see as closely to their objects as the young, and therefore to see the objects larger than they could themselves otherwise see them, but not larger than they are seen by the unassisted younger eye.

In saying that an object appears larger at one time, or to one person, than another, it is necessary to guard against misconception. By the apparent size of an object we mean the angle it bears to the eye, or the angle formed by two lines drawn from the centre of the eye to the extremities of the object. In figure 1, the lines AE and BE drawn from the arrow to the eye form the angle AEB, which, when the angle is small, is nearly twice as great as the angle CED formed by lines drawn from the eye at twice the distance. The arrow AB will therefore appear nearly twice as long as CD, being seen under twice the angle, and in the same proportion for any greater or lesser difference in distance. The angle in question is called the angle of vision, or the visual angle.

The angle of vision must however not be confounded with the angle of the pencil of light by which an object is seen, and which is explained in figure 2. Here we have drawn two arrows placed in relation to the eye as before, and from the centre of each have drawn lines exhibiting the quantity of light which each point will send into the eye at the respective distances.

Now if EF represents the diameter of the pupil, the angle EAF shows the size of the cone of pencil of light which enters the eye from the point A, and in like manner the angle EBF is that of the pencil emanating from B, and entering the eye. Thence EAF is double EBF, it is evident that A is seen by four times the quantity of light which could be received from an equally illuminated point at B; so that the nearer body would appear brighter if it did not appear larger; but as its apparent area is increased four times as well as its light, no difference in this respect is discovered. But if we could find means to send into the eye a larger pencil of light, as for instance that shown by the lines GAH, without increasing the apparent size in the same proportion, it is evident that we should obtain a benefit totally distinct from that of increased magnitude, and one which is in some cases of even more importance than size in developing the structure of what we wish to examine. This, it will be hereafter shown, is sometimes done; for the present, we wish merely to explain clearly the distinction between apparent magnitude, or the angle under which the object is seen, and apparent brightness, or the angle of the pencil of light by which each of its points is seen, and with these explanations we shall continue to employ the common expressions magnifying glass and magnifying power.

The magnifying power of a single lens depends upon its focal length, the object being in fact placed nearly in its principal focus, or so that the light which diverges from each point may, after refraction by the lens, proceed in parallel lines to the eye, or as nearly so true as is requisite for distinct vision. In fig. 3, AB is a double convex lens, near which is a small arrow to represent the object under examination, and the cones drawn from its extremities are portions of the rays of light diverging from those points and falling upon the lens. These rays, if suffered to fall at once upon the pupil, would be too divergent to permit their being brought to a focus upon the retina by the optical arrangements of the eye. But being first passed through the lens, they are bent into nearly parallel lines, or into lines diverging from some points within the limits of distinct vision, as from C and D. Thus altered, the eye receives them precisely as if a cone of light emanated from a large point placed at CD, which we may suppose to be ten inches from the eye, and then the difference between the real and the imaginary arrow is called the magnifying power of the lens in question.

From what has been said it will be evident that two persons whose eyes differed as to the distance at which they obtained distinct vision, would give different results as to the magnifying power of a lens. To one who can see distinctly with the naked eye at a distance of five inches, the magnifying power would seem and would indeed be only half what we have assumed. Such instances are however rare; the focal length of the eye usually ranges from six to twelve or fourteen inches, so that the distances we first assumed of some ten inches in very near the convenient number, inasmuch as a cipher added to the numerator of the fraction which expresses the focal length of a lens gives its magnifying power. Thus a lens whose focal length is one-sixteenth of an inch is said to magnify forty times.

When the focal length of a lens is very small it is difficult to measure accurately the distance between its centre and its object. In such cases the best way to obtain the focal length for parallel or nearly parallel rays is to view the image of some small distant object formed by the lens placed at an angle to the small image so sought, and through another lens of one inch solar focal length, keeping both eyes open and comparing the image presented through the two lenses with that of the naked eye. The proportion between these two images would give the focal length required. Thus if the image seen by the naked eye in ten times as large as that shown by the lenses, the focal length of the lens in question is one-tenth of an inch. The pans of glass in a window, or courses of bricks in a wall, are convenient objects for this purpose.

In whichever way the focal length of the lens is measured, the rules given for deducing its magnifying power are not rigorously correct, though they are sufficiently so for all practical purposes, particularly as the whole rests on an empirical estimate of the size of the pupil. It is true, it does not in any way affect the actual measurement of the object. To calculate with great precision the magnifying power of a lens with a given focal length of eye, it is necessary that the thickness of the lens be taken into the account, and also the focal length of the eye itself.

We have hitherto considered a magnifying lens only in reference to its enlargement of the object, or the increase of the angle under which the object is seen. A further and equally important consideration is that of the number of rays or quantity of light by which every point of the object is rendered visible. The naked eye, as shown in fig. 2, admits from each point of every visible object a cone of light having the diameter of the pupil for its base, and most persons are familiar with that beautiful provision by which in cases of excessive brilliancy the pupil spontaneously contracts to reduce the cone of admitted light within bearable limits. This effect is still further produced in the experiment already described, of looking at an object through a
hole in a card, which is equivalent to reducing the pupi to the size of a needle-hole. Seen in this way the object becomes comparatively dark or obscure; because each point is seen by means of a very small cone of light, and a little consideration will suffice to explain the different effects produced by the needle-hole and the lens. Both change the angular range of the light presented to the eye, but the lens changes the angle by bending the extreme rays within the limits suited to distinct vision, while the needle-hole effects the same purpose by cutting off the rays which exceed those limits.

It has been shown that removing a brilliant object to a greater distance will reduce the quantity of light which each point sends into the eye, as effectually as viewing it through a needle-hole; and magnifying an object by a lens has been shown to be the same thing in some respects as removing the object. We find the magnified picture by the light emanating from the small object, and it becomes a matter of difficulty to obtain from each point a sufficient quantity of light to bear the diffusion of a great magnifying power. We want to perform a operation just the reverse; we want to magnify the eye to the object—the largest possible pencil of light from each point of the object.

Referring to fig. 3, it will be observed that if the eye could see the small arrow at the distance there shown without the intervention of the lens, only a very small portion of the 2 cones of light drawn from its extremities would enter the pupil; whereas we have supposed that after being bent by the lens the whole of this light enters the eye and that cones of smaller angle whose summits are at C and D. These cones will further explain the difference between large and small pencils of light; those from the small arrow are large pencils; the dotted cones from the large arrow are small pencils.

In assuming that the whole of this light could have been suffered to enter the eye through the lens A B, we did so for the sake of not perplexing the reader with too many considerations at once. He must now learn that so large a pencil of light would have been formed with a single lens; and so the spherical figure of the lens, and the chromatic dispersion of the glass, as to produce a very confused and imperfect image. This confusion may be greatly diminished by reducing the pencil, for instance, by applying a stop, as it is called, to the lens which is the card with the needle-hole applied to the eye. A small pencil of light may be thus transmitted through a single lens without suffering from spherical aberration or chromatic dispersion any amount of light material, the new figure of the object, but this quantity of light is insufficient to bear diffusion over the magnified picture, which is therefore too obscure to exhibit what we most desire to see,—those beautiful and delicate markings by which one kind of organic matter is distinguished from another. At a distance these markings are not seen at all; with a large aperture and a single lens they exhibit a faint nebulous appearance enveloped in a chromatic mist, a state which is of course utterly valueless to the naturalist, and not even amusing to the amateur.

It becomes therefore a most important problem to reconcile a large aperture with distinctness, or, as it is called, definition; and this has been done in a considerable degree by effecting the required amount of refraction through two or more lenses instead of taking place through the single lens at a distance which can be ascertained most by actual experiment. Their plane sides are placed towards the object, and the lens of shortest focal length next the object.

It appears that Dr. Wollaston was led to this invention by considering that the Achromatic Huyghenian Eye-piece, which will be hereafter described, would, if reversed, possess similar good properties as a simple microscope. But it will be evident when the eye-piece is understood, that the circumstances which render it achromatic are very imperfectly applicable to the simple microscope, and that the doubler, without a nice adjustment of the stop, would be valueless. Dr. Wollaston makes no allusion to a stop, nor is it certain that he contemplated its introduction, although his illness, which terminated fatally soon after the presentation of his paper, may account for the omission.

The nature of the corrections which take place in the doubler is explained in the annexed diagram (fig. 5), where L O L' is the object, P a portion of the pupil, and D D the stop, or limiting aperture.

Fig. 5.

Now, it will be observed that each of the pencils of light from the extremities L L' of the object is rendered excentric to the stop, and of consequences each passes through the two lenses on one side of the axis or P; thus each becomes affected by opposite errors, which to some extent balance and correct each other. To take the pencil L, for instance, which enters the eye at R B B, it is bent to the right at the first lens, and to the left at the second; and as each bending alters the direction of the blue rays more than the red, and moreover as the blue rays fall nearer the margin of the second lens, where the refraction, being more powerful than near the centre, compensates in some degree for the greater length of the second lens, the blue and red rays will emerge very nearly parallel, and of consequence colourless to the eye. At the same time the spherical aberration has been diminished by the circumstance that the side of the pencil which passes one lens nearest the axis passes the other nearest the margin.

This explanation applies only to the pencils near the extremities of the object. The central pencil, it is obvious, would pass both lenses symmetrically; the same proportions of light occupying nearly the same relative places on both lenses. The blue light would enter the second lens nearer to the axis than the red, and being thus less refracted than the red by the second lens, a small amount of compensation would take place, and the blue rays would be less refracted than the red. This is the reason why, in passing through a single lens, and will transmit a pencil of an angle of from 35° to 50° without any very sensible errors. It exhibits therefore many of the usual test-objects in a very beautiful manner.

The test in the improvement of the simple microscope bears more analogy to the eye-piece. This improvement was made by Mr. Holland, and it consists (as shown in fig. 6) in substituting two lenses for the first in the double, and retaining the stop between them and the third. The first bending, being thus effected by two lenses instead of one, is accompanied by smaller aberrations, which are therefore more completely balanced or corrected at the second bend-

Fig. 6.
In the opposite direction, by the third lens. This combination, though called a triplet, is essentially a doublet, in which the anterior lens is divided into two. For it must be recoiled that the first pair of lenses merely accomplishes what might have been done, though with less precision, by one; but the two lenses of the doublet are opposed to each other; the second diminishing the magnifying power of the first. The first pair of lenses in the triplet concur in producing a certain amount of magnifying power, which is diminished in quantity and corrected as to aberration at the third lens by the change in relation to the position of the axis which takes place in the pencil between what is virtually the first and second lens. In this combination the errors are still further reduced by the close approximation to the object which causes the refractions to take place near the axis. Thus the transmission of a still larger angular pencil, namely 65°, is rendered compatible with distinctness, and a more intense image is presented to the eye.

Every increase in the number of lenses is attended with one drawback, from the circumstance that a certain portion of light is lost by reflection and absorption each time that the ray enters a new medium. This loss bears no sensible proportion to the gain arising from the increased aperture, which, being as the square of the diameter, multiplies rapidly; or if we estimate by the angle of the admitted pencil, which is more easily ascertained, the intensity will be as the square of twice the tangent of half the angle. To explain this, let $\theta$ represent the diameter of the lens, or of that part of it which is really employed; $CA$ the perpendicular drawn from its centre, and $AB$, $AD$, the extreme rays of the incident pencil of light $DAB$. Then the diameter being $2CB$, the area to which the intensity of vision is proportional will be $(2CB)^2$, and $CB$ is evidently the tangent of the angle of the admitted pencil $DAB$. If $a$ be used to denote the angular aperture, the expression for the intensity is $(2 \tan \frac{1}{2} \theta)^2$, which increases so rapidly with the increase of $a$, as to make the loss of light by reflection and absorption of little consequence.

The combination of three lenses approaches, as has been stated, very close to the object; so close, indeed, as to prevent the use of more than three; and this constitutes a limit to the improvement of the simple microscope, for it is called a simple microscope, although consisting of three lenses, and although a compound microscope may be made of only three or even two lenses; but the different arrangement which gives rise to the term compound will be better understood when that instrument is described. Before we proceed to describe the simple microscope and its appendages, it will be well to explain such other points in reference to the form and materials of lenses as are most likely to be interesting.

A very useful form of lens was proposed by Dr. Wollaston, and called by him the Periscopic lens. It consisted of two hemispherical lenses, cemented together by their plane faces, having a stop between them to limit the aperture. A similar proposal was made by Mr. Coddington, who however executed the project in a better manner, by cutting a groove in a whole sphere, and filling the groove with opaque matter. His lens, which is the well-known Coddington lens, is shown in fig. 8. It gives a large field of view, which is equally good in all directions, as it is evident that the pencils $AA'$ and $BB'$ pass through under precisely the same circumstances. Its spherical form has the further advantage of rendering the position in which it is held of comparatively little consequence. It is therefore very convenient as a hand-lens, but its definition is of course not so good as that of a well-made doublet or achromatic lens.

Another very useful form of doublet was proposed by Sir John Herschel, chiefly like the Coddington lens, for the sake of a wide field, and chiefly to be used in the hand. It is shown in fig. 9: it consists of a double convex or crossed lens, having the radii of curvature as 1 to 6, and of a plane concave lens whose focal length is to that of the convex lens as 13 to 5.

Various, indeed innumerable, other forms and combinations of lenses have been projected, some displaying much ingenuity, but few of any practical use. In the Catacliptic lenses the light emerges at right angles from its entering direction, being reflected from a surface cut at an angle of 45 degrees to the axes of the curved surfaces. It was at one time hoped, as the precious stones are more refractive than glass, and as the increased refractive power is unaccompanied by a correspondent increase in chromatic dispersion, that they would furnish valuable materials for lenses, inasmuch as the refractions would be accomplished by shallower curves, and consequently with diminished spherical aberration. But these hopes were disappointed: everything that ingenuity and perseverance could accomplish was tried by Mr. Varley and Mr. Pritchard, under the patronage of Dr. Goring. It appeared however that the great refractive power, the doubly-refracting property, the colour, and the heterogeneous structure of the jewels which were tried, much more than counterbalanced the benefits arising from their greater refractive power, and left no doubt of the superiority of skilfully made glass doublets and triplets. The idea is now, in fact, abandoned; and the same remark is applicable to the attempts at constructing fluid lenses, and to the projects for giving to glass other than spherical surfaces,—none of which have come into extensive use.

By the term simple microscope is meant one in which the object is viewed directly through a lens or combination of lenses, just as we have supposed an arrow or an insect to be viewed through a glass held in the hand. When however the magnifying power of the glass is considerable, in other words, when its focal length is very short, and its proper distance from its object of consequence equally short, it requires to be placed at that proper distance with great precision; it cannot therefore be held with sufficient accuracy and steadiness by the unassisted hand, but must be mounted in a frame having a rack or screw to move it towards or from another frame or stage which holds the object. It is then called a microscope, and it is furnished, according to circumstances, with lenses and mirrors to collect and reflect the light upon the object, and with other conveniences which will now be described.

One of the best forms of a stand for a simple microscope is shown in fig. 10, where $A$ is a brass pillar screwed to a tripod base; $B$ is a broad stage for the objects, secured by...
the stem by screws, whose milled heads are at C. By means of the large milled head D, a triangular bar, having a small, deep indent at one end and a lens may be attached to the lens-holder E, which has a horizontal movement in one direction, by means of a rack worked by the milled head F, and in the other direction by turning on a circular pin. A concave mirror G reflects the light upwards through the hole in the s of the object is a camera lucida, the lens being placed between two inclined planes of mohogany which support the arms and elevate the wrists to the level of the stage. This apparatus is called the dissecting rest. When dissecting is not a primary object, a joint may be made at the lower end of the stem A to allow the tube to take an inclined position; and then the spring clips shown upon the stage are useful to retain the object in its place. Numerous convenient appendages may be made to accompany such microscopes, which will be a matter for consideration in detail; the most useful are Mr. Varley's capillary cages for containing animalcules in water, and parts of aquatic plants; also his tubes for obtaining and separating such objects, and his phial and phial-holder for preserving and exhibiting small objects, such as the Chara, in the same manner as similar plants, and observing their circulation. The phial microscope affords facilities for observing the operations of minute vegetable and animal life, which will probably lead to the most interesting discoveries. The recent volumes of the Transactions of the Society of Arts contain an immense mass of information of this sort, and to these we refer the reader.

The mode of illuminating objects is one on which we must give some further information, for the manner in which an object is lighted is of importance only to the excellence of the glass through which it is seen. In investigating any new or unknown specimen, it should be viewed in turns by every description of light, direct and oblique, as a transparent object, and as an opaque object, with strong light, with faint light, with large angular pencils and with small angular pencils thrown in all possible directions. Every change will probably develop some new fact in reference to the structure of the object, which should itself be in some respects rendered more visible by gentle heating or scouring by a clear fire placed between two plates of glass. In this way the spiral vessels of asparagus and other similar vegetables may be beautifully displayed. Dyeing the objects in tincture of iodine will in some cases answer the purpose better.

But the principal question in regard to illumination is the magnitude of the illuminating pencil, particularly in reference to transparent objects. Generally speaking the illuminating pencil should be as large as can be received by the eye, and no larger. Any light beyond this produces indistinctness and glare. The superfuse light from the mirror or beam may be cut off by a screen between these objects, or placed below the stage; but the best mode of illumination is that proposed by Dr. Wollaston, and called the Wollaston condenser. A tube is placed below the stage of the instrument containing a lens A B (fig. 11), which is depressed or depressed within certain limits at pleasure; and at the lower end is a stop with a limited aperture of light, and reflects them upwards through the aperture in C D, so that they are refracted, and form an image of the object at G, which is supposed to be nearly the place of the object. The object is sometimes best seen when the image of the aperture is also best seen; and sometimes it is best to elevate the summit G of the cone A B G above the object, and at others to depress it below; all which is done at pleasure by the power of moving the lens A B. If artificial light (as a lamp or candle) be employed, the flame must be placed in the principal focus of a large detached lens on a stand, so that the rays LL may fall in parallel lines on the mirror, or as they would fall from the cloud. This will be found necessary not only when the Wollaston condenser is employed, but also when the mirror and diaphragm are used. A good mode of imitating artificially the light of a white cloud opposite the sun has been proposed by Mr. Varley; he covers the surface of the mirror under the stage with carton of soda or any similar material, and then concentrates the sun's light upon its surface by a large condensing lens. The intense white light diffused from the surface of the soda forms an excellent substitute for the white cloud, which, when opposite the sun and of considerable size, is the best day-light, as the pure sky opposite to the sun is the worst.

The Compound Microscope may, as before stated, consist of only two lenses, while a simple microscope has been shown to contain sometimes three. In the compound microscope it was evident that the effect of the two first lenses was to do what might have been accomplished, though not so well, by one; and the third merely effected certain modifications in the light before it entered the eye. The compound microscope the two lenses have totally different functions; the first receives the rays from the object, and, bringing them to new foci, forms an image, which the second lens treats as an original object, and magnifies it just as the single microscope magnified the object itself.

The annexed figure (12) shows the course of the rays through a compound microscope of two lenses. The rays proceeding from the object A B C and D, as shown by the lens C D, near it, and thence called the object-glass, that they are converged to foci in A' B', where they form an enlarged image of the object as would be evident if a piece of oiled paper or ground glass were placed there to receive them. They are not so intercepted, and therefore the image is usually more visible near that place; but their further progress is similar to what it would have been had they really proceeded from an object at A' B'. They are at length received by the lens L M, which acts upon them as the simple microscope has been described to act on the light proceeding from its object. They are bent so that they may enter the eye at E in parallel lines, or as nearly so as is requisite for distinct vision. When we say that the rays enter the eye near parallel lines, we mean only those which proceed from one point of the original object. Thus the two parallel rays M E have proceeded from and are part of the cone of rays C A D, emanating from the point A of the arrow; but they do not form two pictures in the eye, because any number of parallel rays which the pupil can receive will be converged to a point by the condenser, and will convey the impression of one point to the mind. In like manner the rays L E are part of the cone of rays emanating from E, and the angle L E M is that under which the eye will see the magnified image of the arrow, which is evidently many times greater than the arrow could be made to occupy in the naked eye.
at any distance within the limits of distinct vision. The magnifying power depends on two circumstances: first, on the ratio of the whole power of the anterior and posterior focal length C'B' or DA'; and secondly, on the power of the eye-lens LM. The first ratio is the same as that between the object A B and the image A'B'; this and the focal length or power of the eye-lens are both easily obtained; and their product is the power of the compound instrument.

Since the power depends on the ratio between the anterior and posterior foci of the object-glass, it is evident that if the magnifying power may be obtained by using the same eye-glass being used; or having determined the first, any further power may be obtained by increasing that of the eye-glass; and thus, by a pre-arrangement of the relative proportions in which the magnifying power shall be divided between the object-glass and the eye-glass, any given distance (within certain limits) between the first and its object may be secured. This is one valuable peculiarity of the compound instrument; and another is the large field, or large angle of view, which may be obtained, every part of which will be nearly equally good: whereas with the best simple microscopes the field is small, and is good only in the centre. The field of the compound instrument is further increased by using two glasses at the eye-end; the first being called, from its being in contact with the eye, the eye-glass; and the other, that called the eye-piece. This will be more particularly explained in the figure of the achromatic compound microscope presently given.

For upwards of a century the compound microscope, notwithstanding its limitations and disadvantages above alluded to, was a comparatively feeble and inefficient instrument, owing to the distance which the light had to traverse, and the consequent increase of the chromatic and spherical aberrations. To explain this we have drawn in fig. 12 a second image near A'B', that the object would not form one image, as has been supposed, but an infinite number of variously-coloured and various-sized images, occupying the space between the two dotted arrows. Those nearest the object-glass would be red, and those farthest from the eyepiece, blue. The effect of this is to produce so much confusion, that the instrument was reduced to a mere toy, although these errors were diminished to the utmost possible extent by limiting the aperture of the object-glass, and thus restricting the angle of the pencil of light from each point of the object. But this involved the defects, already explained, of making the picture obscure, so that on the whole the best compound instruments were inferior to the simple microscopes of a single lens, with which indeed all the important discoveries of the last century were made.

Even after the improvement of the simple microscope by the use of doublets and triplets, the long course of the rays and the large angular pencil required in the compound instrument deterred the most sanguine from anticipating the results which might be obtained by a path free both from spherical and chromatic errors. Within twenty years of the present period, philosophers of no less eminence than M. Biot and Dr. Wollaston predicted that the compound would never rival the simple microscope, and that the idea of achromatising its object-glass was hopeless. Nor can these opinions be wondered at when we consider how many years the achromatic telescope had existed without an attempt to apply its principles to the compound microscope. When we consider the smallness of the pencil required by the telescope, and the enormous increase of difficulty attending every enlargement of the pencil—when we consider further that these difficulties had to be contended with and removed by operations on polished glass—then it is not unnatural that those who used microscopic objects, we shall not be surprised that even a cautious philosopher and most able manipulator like Dr. Wollaston should prescribe limits to improvement.

Fortunately for science, especially for the departments of natural and medical pathology, these predictions have been shown to be unfounded. The last fifteen years have sufficed to elevate the compound microscope from the condition we have described to that of being the most important instrument employed by art and science of nature. It now holds a very high rank among philosophical implements, while the transcendent beauties of form, colour, and organization which it reveals to us in the minute works of nature, render it subservient to the most delightful and instructive pursuits. To these claims on our attention it appears likely to add a third of still higher importance. The microscopic examination of the relations of the colour and of the condition of the surface A C E, will in all probability afford more satisfactory and conclusive evidence regarding the nature and seat of diseases than any hitherto appealed to, and will of consequence lead to similar certainty in the treatment and prevention of remediable diseases.

We have thought it necessary to state thus at large the claims of the modern achromatic microscope upon the attention of the reader, as a justification of the length at which we shall give its recent history and explain its construction. It must be considered that the subject is entirely new ground, and that there are at this time not more than two or three makers of achromatic microscopes in England.

Soon after the year 1820 a series of experiments was begun in France by M. Belleguic, which were followed up by Frauenhofer at Munich, by Ameri at Modena, by M. Chevalier at Paris, and by the late Mr. Tulley in London. In 1824 the last-named excellent artist, without knowing what had been done on the Continent, made the attempt to construct an achromatic object-glass for a compound microscope, and produced one of nine-lenths of an inch focal length, composed of three lenses, and transmitting a pencil of eighteen degrees. This was the first that had been made in England, and it was thought that, disregarding accurate correction throughout the field, that glass had not been excelled by any subsequent combination of three lenses. Such an angular pencil, and such a focal length, would bear an eye-piece adapted to produce a gross magnification of the object, which afterwards made a combination to be placed in front of the first mentioned, which increased the angle of the transmitted pencil to thirty-eight degrees, and bore a power of these hundreds.

While these practical investigations were in progress, the subject of achromatism engaged the attention of some of the most profound mathematicians in England. Sir John Herschel, Professor Airy, Professor Barlow, Mr. Codrington, and others, were engaged in the study of the subject; and though the results of their labours were not immediately applicable to the microscope, they essentially promoted its improvement.

For some time prior to 1830 the subject had occupied the mind of a gentleman who, not merely practical, like the first, nor purely mathematical, like the last-mentioned class of inquirers, was led to the discovery of certain properties in achromatic combinations which had been before unobserved. These were afterwards experimentally verified; and in the course of last year were manufactured by the discoverer, Mr. Joseph Jackson Lister, and read and published by the Royal Society. The principles and results thus obtained enabled Mr. Lister to form a combination of lenses which transmitted a pencil of fifty degrees, with a large and central area where the magnification was very great. This has been the consequence of the recent improvements in achromatic microscopes, and as its results are indispensable to all who would make or understand the instrument, we shall give the more important parts of it in detail, and in Mr. Lister's own words.

'I would premise that the plano-concave form for the correcting flint lens has in that quality a strong recommendation, particularly as it obviates the danger of error which otherwise exists in centring the two curves, and thereby admits of correct workmanship for a shorter focus. The cement together also the two surfaces of the glass diminishes by very nearly half the loss of light from reflexion, which is considerable at the numerous surfaces of a combination. I have thought the clearness of the field and brightness of the picture, and the perfect transparency of the glass, free from any dewness or vegetation from forming on the inner surfaces; and I see no disadvantage to be anticipated from it if they are of identical curves, and pressed closely together, and the ground otherwise treated in the manner of the spherical and chromatic aberrations of a large pencil.'

'Now in every such glass that has been tried by me which has had its correcting lens of either Swiss or English glass, with a double convex of plate, and has been made achromatic by the form given to the outer curve of the convex, the
proportion has been such between the refractive and dispersive powers of its lenses, that its figure has been correct for rays issuing from every point in its aperture that its principal focus is on its plane side, and either tending to a conjugate focus within the tube of a microscope, or emerging nearly parallel.

Fig. 13.

Let A B (fig. 13) be supposed such an object-glass, and let it be roughly considered as a plano-convex lens, with a curve ABC running through it, at which the spherical and chromatic errors are corrected which are generated at any other point in its plane side. Let the glass be thus free from aberration for rays FDEG issuing from the radiant point F, H being a perpendicular to the convex surface, and D to the plane one. Under these circumstances, the angle of emergence GHE much exceeds that of incidence FDI, being probably nearly three times as great.

If the radiant is now made to approach the glass, so that the course of the ray FDEG shall be more divergent from the axis, as the angles of incidence and emergence become more nearly equal, the spherical aberration produced by the two will be to bear a less proportion to the opposing error of the single correcting curve ACB; for such a focus the rays will enter the glass with a greater convexity.

But if F still approaches the glass, the angle of incidence continues to increase with the increasing divergence of the ray, till it will exceed that of emergence, which has in the meanwhile been diminishing, and at length the last error produced by the two will be to bear a less proportion to the opposing error of the curve of correction. When F has reached this point F', at which the angle of incidence does not exceed that of emergence so much as it had at first come short of it, the rays again pass the glass from the same side at so much the larger severance; for, with the difference, they will have made the space produced from which it will be truly corrected at a moderate aperture; that for the space between these two sides that the glass will either be over-corrected, and beyond them either way under-corrected.

The longer aplanatic focus may be found, when one of the plano-convex object-glasses is placed in a microscope, by shortening the tube, if the glass shows over-correction; or by lengthening it, or by bringing the rays together, should they be parallel or divergent, by a very small good telescope. The shorter focus is got at by sliding the glass before another, so long as the length and large aperture is finely corrected, and bringing it forwards till it gives the reflection of a bright point from a globule of quicksilver, sharp and free from mist, when the distance can be taken between the glass and the object.

The longer focus is that which will make the most uncertain the utmost aperture that may be given to the glass, and where, in the absence of spherical error, its exact state of correction as to colour is seen most distinctly.

The correction of the chromatic aberration, like that of the spherical, tends to rise in the march of the marginal rays; so that if a glass which is achromatic, with a moderate aperture, has its cell opened wider, the circle of rays thus added to the pencil will be rather over-corrected as to colour.

The same tendency to over-correction is produced, if, without raising the aperture of the glass, the incident rays are much augmented, as in an object-glass placed in front of another; but generally in this position a part only of its aperture comes into use; so that the two properties mentioned neutralize each other, and its chromatic state remains unaltered. If for example the outstanding colours are observed at the longer focus to be green and violet, which show that the rays of the shorter focus turned to the union of the spectrum, they usually continue nearly the same for the whole space between the foci, and for some distance beyond them either way.

The places of these two foci and their proportions to each other depend on a variety of circumstances. In several object-glasses that I have made for trial, plano-convex, with their inner surfaces cemented, their diameters the radius of the flint lens, and their colour pretty well corrected, the rays have been disposed as if they were diverging from a point near the principal focus; and this focus has been not quite three times the distance of the shorter from the glass: with English flint the rays have had more convergence, and the shorter focus has borne a rather less proportion to that of the longer.

If the surfaces are not cemented, a striking effect is produced by minute differences in their curves. It may give some idea of this, that in a glass of which nearly the whole disk was covered with colour from contact of the lenses, the addition of a film of varnish, so thin that this colour was not destroyed by it, caused a sensible change in the spherical correction.

I have found that whenever extended the longer aplanatic focus, and increased the convergence of its rays, diminished the relative power of the shorter. Thus the plano-convex concave lens, where the radii were to each other as 31 to 33, the pencil of the longer aplanatic focus, from being greatly divergent, was brought to a convergence at a very small distance behind the glass; and the length of the shorter focus, which had been one-half that of the longer, became one-sixth of it.

The direction of the aplanatic pencils appears to be scarcely affected by the differences in the thickness of glasses, if their state as to colour is the same.

One other property of the double object-glass remains to be mentioned, which is, that when the longer aplanatic focus is used, the marginal rays of a pencil not coincident with the axis of the glass are more perfectly distorted, so that a coma is thrown outwards; while the contrary effect of a coma directed towards the centre of the field is produced by the rays from the shorter focus. These peculiarities of the coma seem inseparable attendants on the two foci, and are not observed in the achromatic meniscus as in the plano-convex object-glass.

Of several purposes to which the particular just given seem applicable, I must at present confine myself to the most obvious one of defeating the use of the utmost ease both aberrations in a large focal pincell, and of thus surmounting what has hitherto been the chief obstacle to the perfection of the microscope. And when it is considered that the curves of its diminutive object-glasses have recently been so exactly proportioned as those of a large telescope to give the image of a bright point equally sharp and colourless, and that any change made to correct one aberration was liable to disturb the other, some idea may be formed of what the amount of that obstacle must have been. It will however be evident that if any object-glass is but made achromatic, with its long focus, we have not cured, so that their axes coincide, it may with certainty be connected with another possessing the same requisites and of suitable focus, so that the combination shall be free from spherical error also in the centre of its field. For this the rays have only to be received by the front glass B (fig. 14) from its shorter aplanatic focus F', and transmitted in the direction of the longer correct pencils of the other glass A. It is desirable that the latter pencil should neither converge to a very short focus nor be more than very slightly if at all divergent; and at first to the kind of glass used will keep it within this range, the denser flint being suited to the glasses of shorter focus and larger angle of aperture.

Fig. 14.
The adjustment of the microscope is then perfected, if necessary, by slightly varying the distance between the object-glass; and after that is done, the length of the tube which carries the eye-pieces may be altered greatly without disturbing the correction, opposite errors which balance each other being produced by the change.

If the two glasses which in the diagram are drawn at some distance apart, are brought together (if the place of A for instance is carried to the dotted figure), the rays transmitted by B in the direction of the longer aplanatic pencil of A will plainly be derived from some point Z more distant from P', and lying between the aplanatic focus of A and B; therefore (according to what has been stated) this glass, and consequently the combination, will then be spherically over-corrected. If on the other hand the distance between A and B is increased, the opposite effects are of course produced.

In combining several glasses together it is often convenient to transmit an under-corrected pencil from the front glass, and to counteract its error by over-correction in the middle one.

Slight errors in colour may in the same manner be destroyed by opposite ones; and on the principles described we not only acquire fine correction for the central ray, but, by the opposite effects at the two foci on the transverse pencil, all coma can be destroyed, and the whole field rendered uniform and distinct.

Mr. Lister's paper enters into further particulars, which are not essential to the comprehension of the subject. It is sufficient to say that his investigations and results proved to be of the highest value to the practical optician, and the progress of his science was greatly accelerated by the rapidity of the work.

The new principles were applied and exhibited by Mr. Hugh Powell and Mr. Andrew Ross with a degree of success which had never been anticipated; so perfect indeed was their work in reference to the aplanatic object-glass—so completely were the errors of sphericity and dispersion balanced or destroyed—that the circumstance of covering the object with a plate of the thinnest glass or tale disturbed the corrections, if they had been adapted to an uncoated object, and rendered the object-glass perfect under one condition sensibly defective under the other.

This defect, if that should be called a defect which arose out of improvement, was first discovered by Mr. Ross, who immediately suggested the means of correcting it, and pre sented to the Society of Arts, in 1837, a paper on the subject, which was published in the 51st volume of their Transactions, and which, as it is, like Mr. Lister's, essential to a full understanding of the ultimate refinements of the instrument, will be extracted in full.

In the course of a practical investigation (says Mr. Ross) with the view of constructing a combination of lenses for the object-glass of a compound microscope, which should be free from the effects of aberration, both for central and oblique pencils of great angle, I combined the condition of the greatest possible distance between the object and object-glass; for in object-glasses of short focal length their closeness to the object has been an obstacle in many cases to the use of high magnifying powers, and is a constant source of inconvenience.

In the improved combination, the diameter is only sufficient to admit the proper pencil; the convex lenses are wrought to an edge, and the concave have only sufficient thickness to support their figure; consequently, the combination is the thinnest possible, and it follows that there will be the greatest distance between the object and the object-glass. The focal length is 4 of an inch, having an angular aperture of 60°, with a distance of 4 of an inch, and a magnifying power of 97 times linear with perfect definition on the most difficult Podura scales. I have made object-glasses 4 of an inch focal length; but as the angular aperture cannot be advantageously increased, if the greatest distance between the object and object-glass is preserved, the magnification will be admitted.

The quality of the definition produced by an achromatic compound microscope will depend upon the accuracy with which the aberrations, both chromatic and spherical, are balanced, together with the general perfection of the workmanship. Now, if the platinia's and Holland's triplelets, there are no means of producing a balance of the aberrations, as they are composed of convex lenses only; therefore the best that can be done is to make the aberrations a minimum: the remaining positive aberration in these forms produces its peculiar effect upon objects (particularly the detail of the thin transparent class), which may lead to misapprehension of their true structure; but with the aplanatic object-glass, where the aberrations are correctly balanced, the most minute parts of an object are accurately displayed, so that a satisfactory judgment of their character may be formed.

Indeed, in the object-glass of the microscope, we find the ultimate development of the principles of the achromatic combination. In the microscope, the object is kept in a plane which is parallel to that of the eye; the object-glass is therefore placed between the eye and object, so that it is capable of being brought into coincidence with the object at any distance.

It will be seen by fig. 15, that when a certain angular pencil A O A' proceeds from the object O, and is incident on the reflecting medium, or piece of glass covering the object O, the extreme rays of the pencil impinge on the more marginal parts of the glass, and as the refractions are greater here, the aberrations will be greater also.

Now, if two compound object-glasses have their aberrations balanced, one being situated as in fig. 15, and the other as in fig. 16, and the same disturbing power applied to both, that in which the angles of incidence and the aberrations are small will not be so much disturbed as where the angles are great, and where consequently the aberrations increase rapidly.

When an object-glass has its aberrations balanced for viewing an opaque object, and it is required to examine that object by transmitted light, the correction will remain; but if it is necessary to immerse the object in a fluid, or to cover it with glass or tale, an aberration will arise from these circumstances, which will disturb the previous correction, and consequently deteriorate the definition; and this effect will be more obvious with the increase of the distance between the object and the object-glass.
not encumber the description with the theoretical determination of this quantity, as it varies with exceedingly minute circumstances which we cannot accurately control; such as the distance of the object from the under side of the glass, and the slightest differences in the thickness of the glass itself; and if these data could be readily ob- tained, the knowledge would be of no utility in making the correction, that being wholly of a practical nature.

"If an object-glass is constructed as represented in fig. 16, where the posterior combination $P$ and the middle $M$ have together an excess of negative aberration, and if this be corrected by the anterior combination $A$, having an excess of positive aberration, then this latter combination can be made to act more or less powerfully upon $P$ and $M$, by making it approach or recede from them; for when the three are in close contact, the distance of the object from the object-glass is greatest; and consequently the rays from the object are diverging from a point at a greater distance than when the combinations are separated; and as a lens bends the rays more, or acts with greater effect, the more distant the object is from which the rays diverge, the effect of the anterior combination $A$ upon the other two, $P$ and $M$, will vary with its distance from them. When therefore the correction of the whole is effected for an opaque object with a certain distance between the anterior and middle combination, if they are then put in contact, the distance between the object and object-glass will be increased; consequently the anterior combination will act more powerfully, and the whole will have an excess of positive aberration produced by a piece of flat and parallel glass being of the negative character; it is obvious that the above considerations suggest the means of correction by moving the lenses nearer together, till the positive aberration thereby produced balances the negative aberration caused by the medium.

"The preceding refers only to the spherical aberration, but the effect of the chromatic is also seen when an object is covered with a piece of glass; for, in the course of my experiments, I observed that it produced a chromatic thickening of the outline of the Podura and other delicate scales; and if diverging rays near the axis and at the margin are projected through a piece of flat parallel glass, with the various indices of refraction for the different colours, it will be seen that each ray will emerge slightly inclined to the beam of the component colours of the ray, and that each beam is widely different in form. This difference, being magnified by the power of the microscope, readily accounts for the chromatic thickening of the outline just mentioned. Therefore to obtain the finest definition of extremely delicate and minute objects, they should be viewed without a covering; if it be desirable to immerse them in a fluid, they should be covered with the thinnest possible film of tere, as, from the character of the chromatic aberration, it will be seen that varying the distances of the combinations will not sensibly affect the correction; though object-lenses may be made to include a given fluid or solid medium in their correction for colour.

"The mechanism for applying these principles to the correction of an object-glass under the various circumstances, is represented in fig. 18, where the anterior lens is set in the end of a tube $A A$, which slides on the cylinder $B$ containing the remainder of the combination; the tube $A A$, holding the lens nearest the object, may then be moved upon the cylinder $B$, for the purpose of varying the distance according to the thickness of the glass covering the object, by turning the screw placed $C$; or more simply by sliding the one on the other, and clamping them together when adjusted. An aperture is made in the tube $A$, within which is seen a mark engraved on the cylinder, and on the edge of which are two marks, a longer and a shorter, on which the screw $C$ is placed. When the mark on the cylinder coincides with the longer mark on the tube, the adjustment is perfect for an uncovered object; and when the coincidence is with the short mark, the proper distance is obtained to balance the aberrations produced by glass of an inch thick, and such glass can be readily supplied.

"It is hardly necessary to observe, that the necessity for this correction is wholly independent of any particular construction of the object-glass; as in all cases where the object-glass is corrected for an object uncovered, any covering of glass will create a different value of aberration to the first lens, which previously balanced the aberration resulting from the rest of the lenses; and, as this disturbance is affected at the first refraction, it is independent of the nature of the combination. The visibility of the effect depends on the distance of the object from the object-glass, the angle of the pencil transmitted, the focal length of the combination, the thickness of the glass covering the object, and the general perfection of the corrections for chromatism and the oblique pencils.

"With this adjusting object-glass, therefore, we can have the requisites of the greatest possible distance between the object and object-glass, an intense and sharply defined image throughout the field from the large pencil transmitted, and the accurate correction of the aberrations; also, by the adjustment, the means of preserving that correction under all the variation of the diaphragm in which it may be necessary to place an object for the purpose of observation.

In the annexed engraving, fig. 19, we have shown the triple achromatic object-glass in connection with the eye-piece consisting of the field-glass $F F$ and the eye-glass $E E$, forming together the modern achromatic microscope. The course of the light is shown by drawing three rays from the centre and three from each end of the object $O$. These rays, if left to themselves, form an image of the object at $A A$, but being bent and converged by the field-glass $F F$, they form the image at $B B$, where a stop is placed to intercept all light except what is required for the formation of the image. From $B B$ the rays proceed to the eye-glass exactly as has been described in reference to the simple microscope and to the compound of two glasses.

If we stopped here we should convey a very imperfect idea of the beautiful series of corrections effected by the eye-piece, and which were first pointed out in detail in a paper on the subject published by Mr. Varley in the 41st volume of the Transactions of the Society of Arts. The eye-piece in question was invented by Huyghens for telescopes, with another view than that of diminishing the spherical aberration by producing the refractions at two glasses instead of one, and of increasing the field of view. It was reserved for Boscovich to..."
point out that Huyghen's had by this arrangement accidentally corrected a great part of the chromatic aberration, and this subject is further investigated with much skill in two papers by Professor Airy in the Cambridge Philosophical Transactions, to which we refer the mathematical reader. These investigations apply chiefly to the telescope, where the small pencils of light and great distance of the object exclude considerations which become important in the microscope, and which are well pointed out in Mr. Varley's paper before mentioned.

Let fig. 20 represent the Huyghenian eye-piece of a microscope: FF and EE being the field-glass and eye-glass, and L.M.N the two extreme rays of each of the three pencils, emanating from the centre and ends of the object, of which, but for the field-glass, a series of coloured images would be formed from R.R to B.B; those near R.R being red, those near B.B blue, and the intermediate ones green, yellow, and so on, corresponding with the colours of the prismatic spectrum. This order of colours, it will be observed, is the reverse of that described in treating of the common compound microscope (fig. 12), in which the single object-glass projects a red image beyond the blue. The effect just described, of projecting the blue image beyond the red, is purposely produced for reasons presently to be given, and is called over-correction of the object-glass as to colour. It is to be observed also that the images B.B and R.R are curved in the wrong direction to be distinctly seen by a convex eye-lens, and this is a further defect of the compound microscope of two lenses. But the field-glass, at the same time that it bends the rays and converges them to focus at B.B and R.R, also reverses the curvature of the images as they are shown, and gives them the form best adapted for distinct vision by the eye-glass EE. The field-glass has at the same time brought the blue and red images closer together, so that they are adapted to pass uncoloured through the eye-glass. To render this important point more intelligible, let it be supposed that the object-glass had not been over-corrected, that it had been perfectly achromatic; the rays would then have become coloured as soon as they had passed the field-glass; the blue rays, to take the central pencil for example, would converge at B and the red rays at r, which is just the reverse of what the eye-lens requires; for as its blue focus is also shorter than its red, it would demand rather that the blue image should be at r and the red at B. This effect we have above to be produced by the over-correction of the object-glass, which proteus the blue focus B.B as much beyond the red focus R.R as the sum of the distances between the red and blue focus of the field-glass and eye-lens; so that the separation B.R is exactly taken up in passing through those two lenses, and the whole of the colours coincide as to focal distance as soon as the rays have passed the eye-lens. But while they coincide as to distance, they differ in another respect; the blue images are rendered smaller than the red by the superior refractive power of the field-glass upon the blue rays. In tracing the pencil L for instance, it will be noticed that after passing the field-glass, two sets of lines are drawn, one whole, and one dotted, the former representing the red, and the latter the blue ray, by which this is the accidental effect in the Huyghenian eye-piece pointed out by Boscovich. This separation into colours at the field-glass is like the over-correction of the object-glass; it leads to a subsequent complete correction. For if the differently coloured rays would all together reach the eye-glass, they would then become coloured, and present coloured images to the eye; but fortunately, and most beautifully, the separation effected by the field-glass causes the blue rays to fall so much nearer to the centre of the eye-glass, that in the figure, the refractive power is less than at the margin, that the spherical error of the eye-lens constitutes a nearly perfect balance to the chromatic dispersion of the field-lens, and the red and blue rays L. and L are nearly coincident, presenting, in consequence, the perfect definition of a single point to the eye. The same reasoning is true of the intermediate colours and of the other pencils.

From what has been stated it is obvious that when seen by an achromatic object-glass one in which the usual order of dispersion is so far reversed, that the light, after undergoing the singularly beautiful series of changes effected by the eye-piece, shall come uncoloured to the eye. We can give no specific rules for producing these results. Close study of the principles of achromatism by mathematicians and astronomers we have quoted will do much, but the principles must be brought to the test of repeated experiment. Nor will the experiments be worth anything, unless the curves be most accurately measured and corrected, and the lenses centred and adjusted with a degree of precision which, to those who are familiar only with telescopes, will be quite unprecedented.

The Huyghenian eye-piece which we have described is the best for merely optical purposes, but when it is required to measure the magnified image, we use the eye-piece invented by Mr. Ramsden, and called, from its purpose, the micrometer eye-piece. When it is stated that we sometimes require to measure portions of animal or vegetable matter a hundred times smaller than any divisions that can be artificially made on any measuring instrument, the advantage of applying the scale to the magnified image will be obvious, as compared with the application of engraved or mechanical micrometers to the image of the instrument.

The construction is shown in fig. 21, where E.E and F.F are the eye and field-glass, the latter having now its plane focus at B.B. The red rays from the object are here made to converge at A.A, immediately in front of the field-glass, and here also is placed a pair of objects on which are engraved divisions of 1/40 of an inch or less. The markings of these divisions come into focus therefore at the same time as the image of the object, and both are distinctly seen together. Thus the measure of the magnified image is given by reading the interval of such measures in reference to the real object may be obtained thus, which, when once obtained, is constant for the same object-glass. Place on the stage of the instrument a divided scale the value of which is known, and viewing it through the eye-piece, observe how many of the divisions on the scale attached to the eye-piece correspond with one of those in the magnified image. If, for instance, ten of those in the eye-piece correspond with one of those in the image, and if the divisions are known to be equal, then the image is ten times less than the object, and the dimensions of the object are ten times less than indicated by the micrometer. If the divisions on the microscope and on the magnified scale were not equal, it becomes a mere rule-of-three sum, but in general this trouble as
taken by the maker of the instrument, who furnishes a table showing the value of each division of the micrometer for every object-glass with which it may be used.

While on the subject of measuring it may be well to explain the manner of ascertaining the magnifying power of the compound microscope, which is generally taken on the assumption before mentioned, that the naked eye sees most distinctly at the distance of ten inches.

Place on the stage of the instrument, as before, a known divided scale, and when it is distinctly seen, hold a rule at ten inches distance from the disengaged eye, so that it may be seen by that eye, overlapping or lying by side of the magnified portion of the other scale. Then move the rule till one or more of its known divisions correspond with a number of those in the magnified scale, and a comparison of the two gives the magnifying power.

Having now explained the optical principles of the achromatic compound microscope, it remains only to describe the mechanical arrangements for giving those principles their full effect. The mechanism of a microscope is of much more importance than might be imagined by those who have not studied the subject. In the first place, readiness, or freedom from vibration, and most particularly freedom from any vibrations which are not equally communicated to the object under examination, and to the lenses by which it is viewed, is a point of the utmost consequence. When, for instance, the body containing the lenses is screwed by its lower extremity to a horizontal arm, we have one of the most intolerable forms conceivable; it is precisely the form of the inverted pendulum, which is expressly contrived to indicate otherwise insensible vibrations. The tremor necessarily attendant on such an arrangement is produced by the whole power of the instrument; and as the object on the stage partakes of this tremor in a comparatively insensible degree, the image is seen to oscillate so rapidly, as in some cases to be wholly indistinguishable. Such microscopes cannot possibly be used with high powers in ordinary houses, but only on a firm table, upon which changes are passing, nor indeed are they adapted to be used in houses in which the ordinary internal sources of shaking exist.

One of the best modes of mounting a compound microscope is shown in the annexed view (fig. 22), which, though too minute to exhibit all the details, will serve to explain the chief features of the arrangement.

A heavy pillar E is screwed into a solid tripod B, and is supported by a strong joint at C, on which the whole instrument turns, so as to enable it to take a perfectly horizontal or vertical position, or any intermediate angle, such, for instance, as that shown in the engraving.

The base of the instrument consists of one solid casting DEFG; from F to G being a thick pierced plate carrying the stage and its appendages. The compound body H is attached to the bar DE, and moves up and down upon it by a rack and pinion worked by either of the milled heads I or J. The stage is adjusted to the pillar by the joint C, which being the source of the required movement in the instrument, is obviously its weakest part, and about which no doubt considerable vibration takes place. But inasmuch as the piece DEF is of necessity transmitting such vibrations equally to the body of the microscope and to the objects on the stage, they hold always the same relative position, and no visible vibration is caused, how much sooner may really exist. To the under side of the stage is attached a circular plate K, on which slides the mirror M, and which allows on one side and enables on the other, to reflect the light through the aperture in the stage. Beneath the stage is a circular revolving plate containing three apertures of various sizes, to limit the angle of the pencil of light which shall be allowed to fall on the object for examination. Besides these conveniences the stage has a double movement produced by two racks at right angles to each other, and worked by milled heads beneath. It has also the usual appendages of forceps to hold minute objects, and a lens to examine the object with.

The screw's movement. For this purpose the lower end of the compound body H, which carries the object-glass, consists of a piece of smaller tube sliding in parallel guides in the main body, and kept constantly pressed upwards by a spiral spring, but it can be drawn downward by a lever crossing the body, and acted on by an extremely fine screw whose driven head is seen at N, and the motion of which is tripped by means of the lever through which it acts on the object-glass. The instrument is of course roughly adjusted by the rack movement, and finished by the screw, or by such other means as are chosen for the purpose. One very ingenious contrivance, but applied the stage instead of the body of the microscope, invented by Mr. Powell, will be found described in the 50th volume of the Transactions of the Society of Arts.

The greater part of the directions for viewing and illuminating objects given in reference to the simple microscope are applicable to the compound. An argand lamp placed in the focus of a large detached lens so as to throw parallel rays upon the mirror, is the best artificial light; and for opaque objects the light so thrown up may be reflected by metallic specula (called, from their inventor, Lieberkühn) attached to the object-glasses.

It has been recently proposed by Sir David Brewster and by M. Dujardin to render the Wollaston condenser achromatic, and they have accordingly been made with three pairs of achromatic lenses instead of the single lens before described, with very excellent effect. The last-mentioned gentleman has also projected an ingenious apparatus, called the Hyproscope, attached to the eye-piece for the purpose of correcting the magnified picture.

The erector commonly applied to the compound microscope consists of a pair of lenses acting like the erecting eye-piece of the telescope. But this, though it is convenient for the purpose of dissection, very much impairs the optical performance of the instrument.

For drawing the images presented by the microscope the best apparatus consists of a mirror M (fig. 23), composed of a thin piece of rather dark-coloured glass cemented on to
a piece of plate-glass inclined at an angle of 45° in front of the eye-glass \( E \). The light escaping from the eye-glass is assisted in its reflection upwards to the eye by the dark glass, which effects the further useful purpose of rendering the paper less brilliant, and thus enabling the eye to better see the reflected image. The lens \( L \) below the reflector is to cause the light from the paper and pencil to diverge from the same distance as that received from the eye-glass; in other words, to cause it to reach the eye in parallel lines.

Dr. Wollaston’s Camera Lucida, as shown in fig. 24, is sometimes attached to the eye-piece of the microscope for the same purpose. In this instrument the rays suffer two internal reflections within the glass prism, as will be seen explained in the article Camera Lucida. In this minute figure we have omitted to trace the reflected rays, merely to avoid confusion.

Annexed are four engravings of microscopic objects, the true character of which it is however impossible to give in wood, and is difficult indeed to accomplish by any description of engraving.

Fig. 25 shows a scale of the small insect called Podura Plumbia, the common Skiptail, magnified about five hundred times. To define the markings on this scale clearly is the highest test of a deep achromatic object-glass; and this drawing is given rather to explain what the observer should look for, than as a very correct representation. Fig. 26 is a scale or feather of the Menelaus Butterfly; Fig. 27 is the hair of a singular insect, the Derrmeister; and Fig. 28 is a longitudinal cutting of \( \frac{3}{4} \) inch, showing the circular glands on the vessels which distinguish coniferous woods. These latter objects may be seen by half-inch or quarter-inch achromatic glasses. Opaque objects are generally better exhibited by inch and two-inch glasses when a general view of them is required, and by higher powers when we wish to examine the microscopic structure. In the latter case the light must be obtained by condensing lenses instead of the metallic specula.

Although the reflecting microscope is now very little used, it may be expected that we should mention it. In this instrument, at Fig. 29, the object \( O \) is reflected by the inclined face of the mirror \( M \), and the rays are again reflected and converged by the elliptical reflector \( R R \), which effects the same purpose as the object-glass of the compound microscope. It forms an image which is not susceptible of the over-correction as to colour before described, and which therefore becomes coloured in passing through the eye-piece. This fact, and the loss of light by reflection, will probably always render the reflecting microscope inferior to the achromatic refracting.

The solar microscope has been so nearly superseded by the oxy-hydrogen, that a brief description of the latter must suffice, particularly as their optical principles are similar.

The primary object in both is to throw an intense light upon the object, which is sometimes done by mirrors, and sometimes by lenses. In Fig. 30, \( O \) represents the cylinder of burning lime, \( RR \) the reflector, which concentrates the light upon the object \( OO \); the rays, from which, passing through the two plano-convex lenses, are brought to focus upon a screen placed at a great distance, and upon which is formed the magnified image.

Fig. 31 shows a combination of lenses to condense the light upon the object. In either case the optical arrangements by which the image is formed admit the same perfection as those which have been described for the compound microscopes. A few achromatic glasses for oxy-hydrogen microscopes have been made, and they will ultimately become valuable instruments for illustrating lectures on natural history and physiology. One made by Mr. Ross was exhibited a few months since at the Society of Arts to illustrate a lecture on the physiology of woods. It should be observed however that the oxy-hydrogen or solar microscope requires either a spherical screen, or that the objects should be mounted between spherical glasses, in order to bring the whole into focus at one time. This latter plan was adopted on the occasion just mentioned with perfect success.

MICROSCOPIUM (the Microscope), a constellation of Lacaille, situated above Grus and Indus at the junction of Capricornus and Sagittarius. The only star in it worth notice is α, of the 4th magnitude, (307) in the catalogue of Piazzi, and 2454 in that of the Astronomical Society.

MICROTUS, Schrank’s name for a genus of Murse Rodents, embracing our English Water-rat, Mus euripus. Lim., etc. [Mus. Eur.]

MICROZOAS/AHIA (literally, ‘little animals’). This is the title employed by M. de Blainville for the Animalcule infusoria of earlier writers, who commonly classed these singular objects of microscopic research among the Zoophyta. Bakers, Needham, Buffon, and Spallanzani, conceived the singular facts and hypotheses regarding the origin and vitalities of these animated points, gave little attention to their zoological relations; the works of Linneaus contain almost no notice of more than the larger Vorticelle, Brachews, and the great founder of all the classifications of the animale Infusoria, the first careful observer of their permanent
characters of form, surface, movements, and internal structure, is the accurate O. F. Müller, author of the ‘Zoologia Danica.’ Considering that in 1786 (the date of his work) the microscope had been scarcely at all improved since the days of Hooke, the numerous figures which Müller presented were highly creditable to his eye and hand. They have been frequently copied (as in the ‘Encyclopédie Méthodique’), and yet retain a high value.

Müller’s classification, founded upon the figure and surface of the animal, is convenient to the observer who desires to name the active molecules which pass under his microscope, but unsatisfactory to the zoological student.

The genera are arranged in some degree according to their apparent simplicity.

A. Without external organs.
   * Substance thick.

   Monas. A mere point.

   Protus. Of variable figure.

   Volvox. Spherical.

   Enchengoidea. Cylindrical.

   Vibriola. Round, elongated. (Several of the animals included in this group should have been ranked among the Vermes.)

   * Membranaceous.

   Cycloidea. Oval, complanate (generate by division).

   Paramureuma. Of an oblong figure (generate by division).

   Kyphoma. Sinuate, complanate (generate by division).

   Goniurn. An angular mass.

   Bursaria. Hollow like a purse.

B. With external organs.
   * Naked.

   Ceraria. With an extension like a tail. Some are said to have eyes.

   Trichoda. Named for its hairiness (generate by division).

   Keroma. With little horny protuberances.

   Himantopera. With slender extensions or cirri.

   Lewophora. Ciliated over all the surface (generate by division).

   Vorticella. Ciliated about the mouth, contractile. The cilia have a whirring motion.

   ** Covered with a shell.

   Brachionus. Ciliated nearly as Vorticella.

   On this classification Lamarck (Anim. sans Vertêbres) has made few alterations; he preserves the same genera nearly in the same order in all the naked Infusoria, but rejects from those with external organs (Infusoires appendiculés) Vorticella and Brachionus (which he places among his Polypi), and re-arranges the others thus:

   Infusoires appendiculés.

   No tail { Trichoda (including Lewophora of Müller). Keroma (including Himantopus of Müller).}

   Ceraaria.

   A tail { Paraceraaria.}

   The remaining groups are thus classed among the Polypi:

   Polypi ciliati.

   Section I. Vibratilis with oral cilia, having vibratory movements.

   Ruditus. (Trichoda ratus and T. clavus of Müller).

   Trichocerca. (Ceraria forcipata, &c., Müller).

   Vaginicephala. Trichoda inquilina, &c., Müller).

   Section II. Rotiferi, with oral cilia having rotatory movements.

   Folliculina. (Vorticella ampuila, vaginata, &c., Müller).

   Brachionus. (Divided into sections, with or without a tail).

   Paraceraaria. (Includes the Vorticella rotatoria, or wheel-animal, and others allied to it).

   Uruccella. (Vorticella viridis, bursaria, &c., Müller).

   Vorticella. (The pedunculated species of Müller, both simple and compound).

   Tadpolea.

   Cuvier constitutes for the Infusoria his fifth and last class of zoophyta, observing however, that always struck the least informed zoologist, who contemplated the various forms and habits of these animals, that among them were several species of contamination, and some forms which could not be reconciled to zoophytic structure. Bory de St. Vincent had adopted (Encyclop. Méthod., 1826) eighty-two genera, but Cuvier even reduces the number of Lamarckian genera.

   Blainville (Actinologie, p. 162) gives the following arrangement of the Microzoaria.

   Division I. Microzoaria Heteropoda.

   Section 1. Rotiferi. Body distinguished in parts anterior, medial, posterior (sometimes really showing head, thorax, abdomen), with anterior bundles or cilia, which in their rapid movement resemble wheels. Posterior appendages simple, terminal.

   The genera are as in Lamarck, with indications of the subgenera adopted by Bory de St. Vincent.

   Section 2. Colifenia, with lateral ciliiform appendices.

   The genera are taken from Müller, viz. Kerona, Himantopus, Paramureuma, Trichoda, Lewophora, Volutex, Cyclidium, Monas, with indications of the subdivisions adopted by Bory de St. Vincent, &c.

   Division II. Microzoaria Apoda, with no external appendices, including Bursaria, Kolpoda, Trachelina (Vibrir, Müller), Potamoea, Ceraria, Enchelia, Gonium. Many of these are thought by Blainville to be young Planaria or Hirudines.

   Nearly all the real information which accompanied these slight transformations of Müller’s system of classification was derived from the numerous and acute observations of that eminent naturalist, whose figures and descriptions we have often compared with the indications of the microscope before this instrument received the marvellous improvements of Amici, Chevalier, Pritchard, Pliis, and Schick. By their inventions, and the able use made of them since 1826, a new mine of knowledge has been opened on the structure, movements, and zoological relations of the Infusoria. Professor Ehrenberg of Berlin has been highly successful in detecting unexpected points of structure even in the minutest animalcula, and has in consequence proposed a new and remarkable classification, depending on a great variety of organizations, which he has discovered and already in a considerable degree made known. (Organisation der Infusorienthiere, Berlin, 1830; Ann. des Sciences Naturelles, 1834; Taylor’s Scientific Memoirs, 1837.)

   The fundamental division proposed by Ehrenberg gives two distinct classes of Infusoria, viz. those which appear to have in their body a complicated digestive cavity, consisting of a great number of cells [Polygastrica], and those which have a simple digestive sac, and wheel-organs about the mouth. [Rotatoria.] To these articles the reader is referred for a full statement of Ehrenberg’s latest classification.

   MICR’UR’AS. [VIBR’ID’Æ.’]

   MICTYRIS. [PINN’OTH’ERÆ.’]

   MIDAS (Zoology). M. Geoffroy’s name for a subgenus of the small South American monkeys called Oissitis. [JACCHUR.] The common name for the species of this subgenus is Tamarien.
forehead with an appearance of prominence, arising from the great angle of the upper edge of the orbits. Upper incisors contiguous, under incisors same size as the upper. Nails like claws, excepting those on the thumbs behind; tail as in Jocusus. General dental formula as in Jocusus.

There are seven species, of which we select as the example Micrococcus leontina, or Leontina Tamarinian.

Description.—This pretty little monkey is entirely of a golden yellow, varying to a redder tint, and pales on the back and thighs. The hair, which is fine and silky, is so long about the head and neck as to form a ruff or mane, whence it has been called the ‘ monarchy’. Its beautiful and gentle manner renders it a very interesting pet; but great care is required to keep it from being destructive to its home. It is supposed to live almost entirely on trees, and to be quite squirrel-like in its habits.

Locality.—Guayacon, and the south of Brazil from Rio Janeiro to Cape Frio. Desmarres notices a red and black variety (Guayacon), and one of a bright shining red from Brazil.

N.B. This must not be confounded with Midas Leomina, Simia leoni, Humb., the Leontia, or Leomina Tamarinian, which is probably the smallest monkey known. The last is brownish, and has a very well developed mane of that colour, which it bristles up when angry, so as to look like a little lion. It is very black, the mouth white, and the tail black above and white below. It inhabits the plains bordering the eastern slope of the Cordillera, and is rare.

Midas’s Ear. [Auricula.][2]

Middle Latitude. [Zeeland.]

Middle Latitude (Navigation), the mean of two latitudes. It is the distinctive name of a method called in navigation middle latitude sailing, which means, that in estimating the difference of longitude by means of the differences of latitude and the intermediate departure, this middle latitude is supposed to be an arc of a parallel of longitude at the intermediate or middle latitude. (Riddle’s Navigation, in which a table may be found corrective of the results.)

Middle Voice is a term employed in Greek grammar to indicate certain Greek verbs called relative in some other languages. The reflective meaning is supposed to be the original and essential meaning of the middle voice, but it is difficult in many of the middle verbs in Greek to trace the reflective notion. Although a separate voice, that is, a distinct mode of conjugation has been assigned to verbs with a middle signification, there are only two tenses in the Greek verb which have a form peculiar to the middle signification, namely, the first and second aorists in λόγοι and λόγοι; which in the model verb, are ἑστειλάω and ἑστείλα. There are four tenses peculiar to the passive signification, namely, the two futures in χρόνοις and χρόνοις, and the two aorists in ένθε τον and ένθος (πάντος, τόν ρόν, χρόνος, χρόνος, ένθε τον, ένθος). The future in χρόνος (πάντος, κενός, λέοντες, λέοντες, έβλος, έβλος, ένθε τον, ένθος). The future tense of χρόνος, has a passive signification, as well as a middle. (Monck on Kupir, Hippol., 1:458; Quarterly Journal of Education, vol. iv., p. 158.) The following table will make the matter clearer:

**Tenses common to the passive and middle significations.**

<table>
<thead>
<tr>
<th>Present</th>
<th>Imperfect</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>πάντος</td>
<td>πάντος</td>
<td>πάντος</td>
</tr>
<tr>
<td>κενός</td>
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<tr>
<td>λέοντες</td>
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</table>

**Tenses peculiar to the middle signification.**

<table>
<thead>
<tr>
<th>1st Aorist</th>
<th>2nd Aorist</th>
<th>1st Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>ἐστειλάω</td>
<td>ἑστείλα</td>
<td>ἑστείλα</td>
</tr>
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</table>

**Tenses peculiar to the passive signification.**

<table>
<thead>
<tr>
<th>1st Aorist</th>
<th>2nd Aorist</th>
<th>1st Future</th>
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</thead>
<tbody>
<tr>
<td>ιήσους</td>
<td>ἱέσους</td>
<td>ἱέσους</td>
</tr>
</tbody>
</table>

Since then so many tenses in the Greek verb have the same form both for the middle and passive signification, it becomes an interesting object of inquiry, whether we should assign the priority to the middle or passive signification; this question has usually been answered by grammarians in favour of the passive; but the question, and the comparison of other languages, and the Greek, would lead us to a contrary supposition. Very few of the Indo-European languages have a form peculiar to the passive signification; even in Sanskrit the passive verb is not considered by Hindu grammarians as a distinct voice, but is classed among the derivative verbs. There are however two voices in the Sanskrit verb, answering to the Greek active and middle, which are called respectively paramanantad and atmosanad; the former answering to the active in Greek, and the latter having generally a reflexive or medial but never a passive signification. The tenses of the passive verb are formed by prefixing the syllable ἅν to the present endings of the atmosanad conjunction. These present endings are evidently the same as those of the middle voice (see above), as the following table of the present tense will show:

<table>
<thead>
<tr>
<th>Sanskrit</th>
<th>Greek</th>
</tr>
</thead>
<tbody>
<tr>
<td>ἁνίσαμ</td>
<td>ἅνίσαμ</td>
</tr>
<tr>
<td>ἁνίσαμ-α</td>
<td>ἅνίσαμ-α</td>
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<td>ἁνίσαμ-τε</td>
<td>ἅνίσαμ-τε</td>
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<td>ἁνίσαμ-όδε</td>
<td>ἅνίσαμ-όδε</td>
</tr>
<tr>
<td>ἁνίσαμ-μέθα</td>
<td>ἅνίσαμ-μέθα</td>
</tr>
<tr>
<td>ἁνίσαμ-θε</td>
<td>ἅνίσαμ-θε</td>
</tr>
<tr>
<td>ἁνίσαμ-πρός</td>
<td>ἅνίσαμ-πρός</td>
</tr>
<tr>
<td>ἁνίσαμ-θέ</td>
<td>ἅνίσαμ-θέ</td>
</tr>
<tr>
<td>ἁνίσαμ-κατα</td>
<td>ἅνίσαμ-κατα</td>
</tr>
<tr>
<td>ἁνίσαμ-τι</td>
<td>ἅνίσαμ-τι</td>
</tr>
<tr>
<td>ἁνίσαμ-τό</td>
<td>ἅνίσαμ-τό</td>
</tr>
</tbody>
</table>

That the passive signification should abound in time have taken the place of the middle, will not appear surprising, when it is recollected that a reflective verb is actually used in many languages, where a passive is used in others to express the same thing. An instance occurs in such a phrase as les bas que vendent ici, stockings sell themselves here, and in the same manner in Italian we have such phrases as ci vende molle cera, a kind of wax, which is sold, or are said; si loda il uomo modesto, a modest man praises himself, that is, is praised; mi si domanda uomo scando, a dollar demands itself of me, that is, is demanded of me. The same signification occurs both in Italian and Portuguese.

It has been the practice to deny to the Latin the possession of a middle, except in the case of deponent verbs. But in such a phrase as Rheum Oceano miscutet, the verb is rather of the middle than the passive character, and this certainly must be allowed when it is said of a soldier induturis galeam, or when a general militares jubes, or as in the line of Virgil (Georg. iii. 219)—

Passer in magna sylva foras pervenit.

The above explanation of the middle form or voice is one which has been proposed; still the matter may require further discussion. The truth is, that the classification of verbs into active and passive, or into active, passive, and middle, is a very imperfect one, and for the purposes of a philosophical exhibition of grammar a new classification is wanted. The expressions ‘I walk,’ ‘I eat,’ &c., are in signification fixed, and the forms of these words do not differ from the form of I ‘I walk,’ &c.

In order to express the notion of the person ‘I’ being killed, some modification of the primitive term ‘kill’ must be made, and another modification may be necessary to express the act of killing, and the notion of being killed, and it is for this reason that the perfect form of the word has been modified, and it has been given the signification of being killed.

In the last instance the act of self-killing is distinguished from the act of ‘being killed’ by the addition of a word. In the Greek language the present tense of the passive form may be used to express either the act of the person being killed, or killing himself. In the first and second aorist tenses a peculiar form is used to express the act of self-killing; but as this peculiar form has the characteristic termination of what is called a passive verb, and not of an active, it might be classed under the passive voice form. In the present tense there is no peculiar tense, and the term middle voice might be got rid of altogether.

**Middlesex.** the metropolitan county of England, is bounded on the north by Hertfordshire; on the east by Essex, and on the south-east by Kent; on the south-west by Surrey, from both of which it is separated by the river Thames; and on the west by Buckinghamshire, from which it is separated by the river Colne. Its greatest length is, from north-east to south-west, 26 leagues; less near Weymouth, where the bay is opposite Chertsey, 28 miles; its greatest breadth, at right angles to the length, is, from near South Mimms on the great north road to Lymehouse, 17 miles. Its area is estimated at 292 square miles. The number of inhabitants in 1811 was 1,144,531, which in 1821 was showing an increase in ten years of 213,799, or about 19 per cent, and giving 4817 inhabitants to a square mile. It is the smallest of all the English counties, except Rutland; in amount of population it is exceeded, and that only in a small degree, by Yorkshire alone; in density of population it very far
exceeds any other English county. The courts of civil and criminal jurisdiction are held in London or Westminster, or at Clerkenwell, in the suburbs of London; but for parliametary purposes Brentford, seven miles from Hyde (park Corner) on the great western road, is the county town.

Surface; Geological Character.—The surface of the county consists for the most part of gentle undulations, affording a sufficient slope for the purposes of drainage. A prominent feature of the county is the chalk, which forms a barrier by Barnet, Euston, Staneham, and Pinner, averaging 400 feet in height above the level of the Thames. Another range of hills skirts the northern side of the metropolis by Horsley. It is divided into the two ranges between these two ranges. That portion of the county which lies south-west of a line drawn from Brentford to Uxbridge is an almost unbroken flat, rarely rising more than from 10 to 20 feet above the level of the Thames.

The county is chiefly occupied by the London clay. Enfield Chase, the most northern portion, and a strip along the western boundary by Harefield and Uxbridge, are occupied by the plastic clay, which here crops out. The high ground about Hampstead, Highgate, and Horsley consists of Bagshot sand, a marine formation of uncertain depth covering the London clay. The thickness of the London clay is very variable. At Bromley near the Lea, in the south-east corner of the county, it is over 60 feet (8 feet of lignitic marl), while at White's Club-house, St. James's, London, it was 235 feet. The thickness of the plastic clay in this county appears to be from 100 to 120 feet.

West Datchet is entirely to the basin of the Thames, which forms its southern boundary. The Thames first touches the border just above Staines, at the junction of one of the arms of the Colne, and flows about six or seven miles to the southernmost point of the county near Shepperton, where it takes the opposite branch from the Thames at Sheen Stratford. A junction of the Wey it flows in a circuitous channel eastward 8 miles to Thames Ditton, above Kingston, and from thence 9 miles in a winding channel northward to Kew Bridge, just below Brentford. From Kew Bridge the Thames divides into two channels, 20 miles, with many bends, to the junction of the Lea, just above which it makes a circuit, nearly encompassing a marshy peninsula at the south-eastern angle of the county, called the Isle of Dogs. This river is crossed by several bridges: at Staines and Chertsey (both of stone), West Molesey (brick), Hampton Court (wood), Kingston, Richmond, and Kew (all of stone), Hammersmith (a suspension bridge), and Putney and Chelsea (wood).

There are six bridges in the metropolis: Vauxhall (an iron bridge), Lambeth (an iron branch cuts or basins of the Thames), Stonehaw (an iron bridge), and London, the lowest on the river, a stone bridge. Between Rotherhithe and Wapping, about a mile and a half below London Bridge, a tunnel is in progress under the bed of the river. It has a double-bore tunnel with an archway between, and it is to be by an inclined plane for canoes and horses, and a flight of steps for foot passengers. The river is navigable throughout for laden barges; but locks are required in the upper part to keep up the water. The lowest of these locks is at Teddington, between Kingston and Richmond bridges. Up to London Bridge the Thames is navigable for sea-borne vessels, and the space between that bridge and the junction of the Lea forms the port of London. [London] The marsh (of the Thames, and its tributary) road, broads, and banks in some places marshy. The Isle of Dogs would be overflowed every tide, if it were not protected by embankments. The Lea forms the eastern boundary of the county, which it touches below Waltham Abbey. Its waters are, at the present day, divided from the Thames by a conduit, which reunite very soon after. Its course is southward through a belt of low marsh-land, 8 miles to the foot of Stannford Hill. In this part there is a navigable cut, distinct from the natural bed of the river, extending from Stannford Hill to Epping (Hainault). The great northern road (to Dedham, Essex) crosses this channel, and passes through Kingsland, Tottenham, Edmonton, and Enfield. Of the Norfolk and Suffolk roads, one leaves London by Shoreditch church, passing through Hackney, and crossing the river, and leaves by Whitechapel church, and crosses by Bow Bridge into Essex. These are the most important roads; but there are others well frequented. [One (the Edgware road) leads from Tyburn turnpike by Paddington and Edgware into]
Hertfordshire, joining the north road at St. Albans; another
passes by Harrow and Pinner to Rickmansworth; and a
third, called 'the Green Lanes,' leads by Stoke Newington
and New Barnet to Enfield.

The Birmingham Railway has its London terminus at
Euston Grove, on the north side of the metropolis, and
runs past Harrow to Watford in Hertfordshire; and the
Great Western Railway has its London terminus at Fel-
don, just outside Acton, Ealing, and Southall to
Maidenhead. The Eastern Counties Railroad com-
meences at Mile End and runs by Bow and Stratford across
the Lea into Essex: it is to communicate with Norwich
and Great Yarmouth. There is another railway in progress,
called the Northern and Eastern Railway, which also com-
meences at Whitechapel, and is intended to communicate
with Cambridge. Acts have been obtained for the Com-
mercial Railway, to run from the eastern side of London
to Blackwall; and for the Bristol, Birmingham, and
Thames Junction Railway.

Agriculture.—The soil of this county is of three distinct
qualities: poor sand and gravel on the tops of some of the
hills and in various spots in the plain; a heavy poor clay
in the north and north-west portion, which is chiefly covered
with permanent grass, enriched by repeated application of manure;
and a good fertile loam over a bed of gravel, and sometimes of
peats, along the plain in which the Thames flows. To
these three classes some admixture of some lighter and
more dry soil is necessary, which is admirably adapted for
grain, and have been almost entirely converted into a rich black vegetable mould, by an
abundant application of dung, from time immemorial.

In the exception of a few hills on the northern side of London, none of which rise more than 400
feet above the Thames, may be described as a plain, almost
perfectly level as it approaches the Thames, but with a suffi-
cient fall for the waters to prevent any. The vegetation is
chiefly that of the Thames valley, and the plain is
shaped by the winds, from the Thames, which is a great
drawback to the profit. The produce is generally
conveyed in waggons with four horses, or in tumbrels with
two or three. A man and a boy are required in each case.

Light single-horse carts, such as are used in Scotland,
are quite unknown here. In the village of several carts, as is usually done there, and also in France
but the great traffic on the roads near London renders the
very dangerous, and the law prohibits it. Every wagon
with four horses, a man, and a boy, costs the proprietor
from 1s. to 1s. 6d. a mile. The horses are not
placed to the account of the load taken to London,
and the other half to that of the manure brought back
It will appear that, however convenient it may be to be able to
transport goods at any time, and in any quantity, it is not
so easily obtained as might be supposed, and a number of horses required for a Middlesex farmer is much
greater than where the land lies at a greater distance from
any large town. The stable-dung is brought in a very fresh
and loose state; it is put together in huge barns, and
heated very soon, and is turned over, and sometimes
covered with earth or sods. By the time it is carried up
the land it will have cost the farmer not much less than
1s. per wagon-load of three tons. Upon the lighter loads,
and for smaller quantities, there is more advantage to raise turnips, and fold the sheep on
them, than to sell the turnips and buy town manure.

The course of crops on the farms in Middlesex is not so
regular as in many other counties; but the alternation of
grain to roots is very general. The present season,
fales are almost entirely disused, even on the heaviest
soils. The land is kept clean by tares cut green, peas
gathered in the pod, beans, and similar crops, which allow
of ploughing and cleansing the land in summer, and sowing
roots afterwards. The crops are usually drilled and
sowed: the principal are barley, clover, wheat, beans, oats
—often in this order. Turnips and mangels-wurtzel are not so
extensively cultivated as they are where manure must be
more extensively raised. The fodder for the horses, is indispensable; some of these are occasionally
taken to London early in the season, and sell well in
quantities, tied up in bundles. Potatoes are not planted to
a great extent as might be supposed, considering the
revenue of good land in Middlesex is taken into
consideration the carriage of manure, and the bulk of the crop to be
called so at all. The expense is so great that the net return is
more than that of wheat, beans, or clover. It is very seldom
that potatoes are planted as a substitute for the old field
Beans or peas in wide rows, and carefully hosed, are much
preferred. The soil is naturally rich, and requires
little manure to recruit it.

The arable portion of the county lies chiefly towards
Buckinghamshire, and between the Great Western Road
and the Thames. Some extremely good loams of consider-
able depth on a bed of flinty gravel, well adapted to every
kind of agricultural produce, occur in several places. The
lighter portion of the land is laid out in gardens, and nursery-grounds. Almost the whole of the
land in the parishes of Chislehampton, Chawley,
Ickworth, and Brentford is taken up by such gardens.
Here the spade is the principal instrument of cultivation. [Gt. Com.
and Manut.]

Beyond Hounslow, including what was formerly House-
low Heath, the land is cultivated more extensively, by
farmers properly so called; and some of these occupy from
200 to 1500 acres. Here every improvement in the
management of the soil is really trying, as the best
manure is not in use: and it only requires a view of the fields along
the two great branches of the western road to perceive
that the land is kept clean and that the crops are good.
The system is greatly modified by the short distance from
an inexhaustible source of manure. It is not necessary to
keep many head of cattle or great flocks of sheep to pro-
duce manure for the land. A smaller portion of the farm
is devoted to raise food for cattle. Roots are disposed of
to a great extent; and from the Thames, which is a
great drawback to the profit. The produce is generally
conveyed in waggons with four horses, or in tumbrels with
two or three. A man and a boy are required in each case.

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more than that of wheat, beans, or clover. It is very seldom
that potatoes are planted as a substitute for the old field
Beans or peas in wide rows, and carefully hosed, are much
preparatory. Cose or rape is frequently sown on stiff loams, instead of turnips, and fed off with sheep. If the rape is dry, it is deemed an advantage to the land, for the excellent preparation for wheat. It should have plenty of manure which will be decomposed and well mixed with the soil when the wheat is sown. Thus the latter crop cannot fail to be good.

Grass-land is everywhere well managed. The surface is kept intersected with water-furrows wherever the soil is impervious to water, so that it never stagnates in winter. The grass is generally cut twice in the season, and made into hay; but the land is well manured, generally after the first mow, about the middle of June. Midsummer rains wash it in, and the after-month is much increased by it. Two tons of hay at the first mowing, and one ton at the second, may be considered as the average produce of a grass-land about ten miles from London, including rates and tithe, average from 4s. to 6s. per acre. Nearer London grass-land lets very high for milk cows, and likewise for pleasure horses to graze in. But the rapid increase of buildings has converted so many fields into streets, or broken up the surface for the sake of the brick-earth, that the green meadows are every year further from the centre of the metropolis.

Every breed of animal is to be met with in Middlesex. Here are all the constituent parties of the dairy-cattle as useless. The cart-horses are generally fine and strong, and some very large, while a little too heavy for a carriage and too slow for stage-coaches, but which make excellent cart-horses, are brought to London in large quantities by dealers, who collect them from over the area, and, in the dairy cows are chiefly of the large Holderness breed or the short-horn. Yorkshire cows have been tried, and, as far as milk goes, they are equally full to the other breeds, taking the quantity of food consumed by each into consideration; but they do not yield such heavy carcases to the butcher when fattened off. The most approved system of London dairymen is to let a cow be milked till she goes dry, and never allow her to go to the bull. By very high feeding during the winter the milk is not the best, and the time she is dry will be very fat. Private families in the neighbourhood of London, who have grass-land, have a predilection for the small Alderney cows, which give a small quantity of extremely rich milk. They are very quiet animals, and may be tethered or led about to graze in a hester. On good pasture they are very profitable. Alderney dairies have been established; but most of them have no title to that name, the large cows having soon superseded them.

The price of labour in Middlesex is not so high, when compared with that of the adjoining counties, as might be expected. Very near London market-gardens pay their labourers from 1s. to 1½ per week for day-labour; but as many earn 2s. 6d. to 3s. 4d. per week. Digging and trenching are done by the square perch, the price varying according to the soil and the depth of the work. A good workman will earn 3s. 6d. or more in a day, for this he must work hard. A mower has from 3s. to 6s. per acre for mowing grass, 2s. 6d. to 3s. 6d. for clover, and the same for oats or barley; oats and peas are looked at from 3s. to 5s. per acre; wheat and rye are pegged, that is, cut close to the ground with a large mowing-hook, for 10s. to 15s. per acre, as the crop may be more or less heavy; beans for 4s. to 6s.; threshing wheat costs 4s. to 5s. per quarter, and 1s. per load for tying up the straw; oats are threshed for 2s. or 2s. 6d.; beans and peas, 1s. 6d. to 2s.; hay is cut, trussed, and every truss weighed, for 2s. 6d. to 3s. the load of thirty-six trusses, which is done by the task. Digging and trenching, August, September 4, are noted for young cattle of every description.

**Divisions, Towns, &c.—Middlesex is divided into six hundreds, as follows:**

<table>
<thead>
<tr>
<th>Division</th>
<th>Acres</th>
<th>Pop. in 1831</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edmonton, N.E.</td>
<td>31,410</td>
<td>26,930</td>
</tr>
<tr>
<td>Gore, N.</td>
<td>29,660</td>
<td>11,315</td>
</tr>
<tr>
<td>Elthorne, N.W.</td>
<td>32,690</td>
<td>20,091</td>
</tr>
<tr>
<td>Isleworth, S.W.</td>
<td>9,270</td>
<td>13,546</td>
</tr>
<tr>
<td>Spelthorne, S.W.</td>
<td>23,500</td>
<td>12,212</td>
</tr>
<tr>
<td>Oxalston, S.E., including</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finsbury division</td>
<td>11,934</td>
<td>151,409</td>
</tr>
<tr>
<td>Holborn</td>
<td>7,898</td>
<td>359,864</td>
</tr>
<tr>
<td>Kensington</td>
<td>19,291</td>
<td>87,961</td>
</tr>
<tr>
<td>Tower</td>
<td>8,988</td>
<td>123,683</td>
</tr>
<tr>
<td>London city</td>
<td>600</td>
<td>201,542</td>
</tr>
<tr>
<td>Westminster city</td>
<td>2,500</td>
<td>220</td>
</tr>
<tr>
<td>Mill Hill</td>
<td>1,270</td>
<td>330</td>
</tr>
<tr>
<td>Total</td>
<td>179,590</td>
<td>1,358,330</td>
</tr>
</tbody>
</table>

The cities of London and Westminster are locally in Oxalston hundred. The suburbs of London form the newly created municipal boroughs of Marylebone, Finsbury, and the Town of Hamlets.

There are four market-towns, Barnet, Brentford, Staines, and Uxbridge: besides Edgware, Enfield, and Hounslow, the markets of which have been discontinued; and a number of other places, which though not ranking higher than villages, derive, from their proximity to the metropolis, a sufficient interest and importance to require notice. [Barnet; Brentford; Chelsea; London.]

Staines is in Spelthorne hundred, 164 miles from Hyde- park Corner, on the road to Epsom and Esher. The parish contains an area of 1710 acres, with a population of 2486. The principal street extends half a mile along the road, and leads to the Thames. Many of the houses in the village are built of brick. A new stone bridge has been built over the river. The church is a neat modern structure, with a square embattled tower, and there are some dissenting places of worship. The market-house is a small building near the bridge. The market is on Friday, and there are two yearly fairs. There are several flour-mills near the town. The living is a vicarage united with the chapelyrie of Laitham and Ashford, of the joint annual value of 425l., with a glebe-house. There were, in 1833, one infant-school, with 90 children; and the church was for 26 girls, a Lancasterian school with 80 boys, and a national school with 40; one other day-school with 30 boys, three boardingschools with 86 children, and three Sunday-schools, with 193 children of both sexes. There is also a Literary and Scientific Institution.

Uxbridge is in the parish of Hillingdon, in Elthorne hundred, about fifteen miles from Tyburn turnpike, on the Oxford road. It was formerly a place of strength, and a corporate town, and in the civil war of Charles I. was the scene of an unavailing negotiation for peace between the commissioners of the king and those of the parliament. The mansion in which the conferences were held is still standing. The area of Hillingdon parish is 4720 acres; the inhabitants, in 1831, amounted to 6835, of whom 3043 were in the chapelry of Uxbridge. The town consists of one principal street, about a mile in length, along the Oxford road, and two or three smaller ones. There are in the principal street two bridges over the arms of the river Colne, and one over the Grand Junction Canal. There is also a commodious market-house of brick, supported on wooden columns; a chapel behind the market-house, built of flint and brick, and destitute of architectural beauty, capable of holding 800 persons; and several dissenting meeting-houses. The market, which is on Thursday, is one of the most important corn-markets in the kingdom. A second market, for provisions, is held on Saturday, and there are several yearly fairs. There are three wharfs and warehouses, and there are many flour-mills. Considerable business is done in the town, and brick-making is largely carried on in the neighbourhood.

The perpetual curacy of Uxbridge is of the clear yearly value of 11l., with a glebe of 60 acres. There is a Lancasterian school, with 187 boys; a school of industry, with 107 girls; three other day-schools, with 114 children; Vol. XV.—2 C
three boarding and day schools, with 87 children; and three Sunday-schools, with 515 children.

Edgware is in Gore hundred, 8 miles from Tyburn turnpike, on the road to Watford and Aylesbury. The parish has an area of 1990 acres, with a population, in 1831, of 591. The place has one long straggling street, but contains some respectable houses. The church is of brick, and was built about the middle of the last century; the tower, more antient, is of flint and stone. The market, which was formerly held on Thursday, has been discontinued for many years. The west side of the church street is the old road of the parish of Stanmore Parva, or Whitchurch. Near this place is Canons, a neat villa, erected on the site and from the materials of a stately mansion built by the duke of Chandos, which was afterwards demolished, and the bricks were ornamented with the arms of the Chandos family. A fine piece of country, with a delightful view, is seen from the north side of the church. Little Stanmore has an area of 1429 acres, with a population, in 1831, of 676. The living of Edgware is a vicarage, of the clear yearly value of 492l., with a glebe-house; that of Stanmore Parva is a perpetual curacy, of the clear yearly value of 267l., with a glebe-house. The two parishes had, in 1833, one infant or dame school, with 41 children; eight day-schools (one endowed), with 129 children; and two Sunday-schools, with 91 children.

Enfield is in Edmonton hundred; that part which is called Enfield Highway is 9 miles from Shoreditch Church, and Edmonton road. Enfield High- nor-house was the residence of Elizabeth (afterwards queen) for a short time, during the reign of her brother Edward VI.; and she resided at Enfield, at the manor-house or at Elsey-hall, at several periods during her reign. Her favourite house among the grounds remains as the queen's residence. Elsey-hall has disappeared, and its exact site is not known. The parish of Enfield has an area of 12,460 acres, with a population, in 1831, of 6612; about one-third agricultural. The houses consist of two principal groups; and many of them are well built. The church is an ancient structure, comprehending chancel, nave, and two aisles, with a low embattled tower. There are a chapel-of-ease, lately erected, and several dissenting places of worship. Edward I. granted a charter for a market on Monday, and James I. for one on Saturday; but they have long fallen into disuse. There are two yearly fairs. There are in the parish a royal manufactory for firearms (partly carried on here and partly at Waltham Abbey), a manufactory for finishing crapes, and two or three other trading establishments. The Lea navigation and the New River pass by or through this parish. Petty sessions and a Court of Requests are held here. The living of Enfield is a vicarage, of the clear yearly value of 370l., with a glebe-house. There were in the parish, in 1833, two infant schools, with 145 children; a school of industry, with 45 girls; seven other day-schools, with 181 children; five boarding and day schools, with 152 children; and four Sunday-schools, with 52 children.

Enfield Chase, formerly a large chase or park north-west of the town, extending into several parishes, is now entirely enclosed.

Hounslow is in the two parishes of Isleworth and Heston, in Isleworth hundred, but chiefly in Heston. The area of the two parishes is 6840 acres; the population, in 1831, was 8997. The town, which is 10 miles from Hyde-park Corner, is at the point where the Bath and Bristol road branches to Exeter and Exeter, and contains a part of a long street on the Exeter road, irregularly paved, and lighted with gas. Hounslow had an ancient priory of the order of the Holy Trinity, which at its suppression, a.d. 1530, had a revenue of 86l. 15s. gross, or 74l. 5s. clear. The conventual chapel, long used as a chapel-of-ease, was taken down a few years since, and has been replaced by a new church, capable of seating above 1000 persons. The market, formerly held on Thursday, has been discontinued for some years. The chief business of the town has of late years been the brewing. The growth of this business is nearly destroyed since the opening of the Great Western Railway. There are some powder-mills and a flax-dressing-mill near the town. Adjoining to the north are two parishes of Heston and West Heston, extensive districts, well-frequented for highway robberies. On this beat the army of James II. encamped before the Revolution. There are large cavalry barracks and an exercise-ground on what was formerly the heath. The remainder is now enclosed. The living of Hounslow is a perpetual curacy, of the clear yearly value of 1234l. There were in Heston parish, in 1833, two infant schools, with about 321 children; three day-schools, with about 188 children; one boarding-school, with 10 boys, and one Sunday-school, with 70 children.

Tottenham is in Edmonton hundred, about 4 miles from Shoreditch church, on the York road. The parish, which is divided into four wards, has an area of 4650 acres, with a population, in 1831, of 6937. The main street is a centre of great trade along the road. In this street is a brick cross, erected A.d. 1600, in place of a former wooden one. The church is on a small eminence a short distance west of the village, and is an ancient building. It is of old brick, with a crocketed crown, and the font is of great antiquity, and there are many monuments. A new church of considerable size has been built on Tottenham Green, and there are several dissenting meeting-houses. Bruce Castle (now occupied as a school) is a brick mansion, rebuilt in the latter part of the seventeenth century. A detached brick tower, which covers a deep well, is the only remain of the previous edifice, which was built by the Comptons early in the sixteenth century. The edifice bears its name from a castle of the Robertes, an elder, father of the king of Scotland of that name, which antiently occupied the site. The river Lea forms the eastern boundary of the parish. There are extensive flour and oil mills. The living of Tottenham is a vicarage, of the clear yearly value of 140l., with a glebe-house; the chapel attached to the new church is of the clear yearly value of 300l., and is in the gift of the vicar. There were, in 1833, two infant schools, with 83 children; an endowed free grammar-school with 48 boys; a 'blue-coat' school, with 23 boys; a school for the education of orphaned cistercian schools, with 283 children; a Catholic school, with 65 children; and several private day and boarding schools. There were also four Sunday-schools, with about 430 or 440 children.

Edmonton is on the York road, 7 miles from Shoreditch church, between Tottenham and Enfield. The parish has an area of 7440 acres, and is divided into four wards or 'streets,' beside an allotment of Enfield Chase assigned to the parish. The population, in 1831, was 1692. The parish of Edmonton consists of two principal groups of houses, called Fore Street, or Upper Edmonton, and Church Street, or Lower Edmonton, extending along the north road for more than a mile, and consisting of some respectable ranges of houses, with detached mansions and villas. Southgate, a detached village west of Edmonton, is in 'South Street,' one of the four wards, and contains many residences of a superior description: among them are Micenchesen House, belonging to the Duke of Bedford, and the Vicarage House. The church for the most part of modern date, but the tower and some other portions are of great antiquity; there are some antient monuments. There are chapels at Southgate and at Winchmore Hill, and several dissenting places of worship. The living of Edmonton is a vicarage, of the clear yearly value of 1550l., with a glebe-house. The chappelries of Southgate and St. Paul, Winchmore Hill, are of the clear yearly value of 160l. and 100l. respectively, and are in the gift of the vicar of Edmonton. There were in the parish, in 1833, an endowed day-school, with 146 children, 60 of whom were clothed; another endowed day-school, with 72 girls; three day-schools, partly or wholly supported by charitable contributions, containing 233 children; two Sunday-schools; one boarding-schools, with 460 children; two day and Sunday schools, with 253 children; and one Sunday-school was for 184 children. Wyer House, in the parish of Edmonton, about a mile north-west of the village, is a fine seat mansion-house built in the early part of the seventeenth century.

Harrow-on-the-Hill is in Gore hundred, 10 miles from Tyburn turnpike, on the road to Rickmansworth. The parish (including the hamlets of Harrow Weald and Green Hill) has an area of about 6 square miles, and contains 3681 acres. The village is irregularly laid out. It derives its celebrity and chief support from its grammar-school, which was founded, under letters-patent of Queen Elizabeth, in 1571, by J. Lyon, a wealthy yeoman of this parish. The school contains, in 1833, about 250 scholast
it is free to all boys of the parish of Harrow, but there are those who take advantage of this opportunity, the scholars are chiefly the sons of the nobility and gentry. Many eminent men have been educated at Harrow: as Bruce, the Abyssinian traveller, Sir William Jones, Richard Brinsley Sheridan, the late Lord Byron, Dr. Parr, and many others. The grammar-school is on the summit of the hill: there are some small portions in the Norman style; and at the west end is a lofty tower, with a spire. The grammar-school is near the church. There are some dissenting meeting-houses; there are two chapels-of-ease, one near the church, and the other at Harrow Weald, a group of houses about two miles north of the village. The living of Harrow is a vicarage, of the clear yearly value of £627, with a glebe-house. The vicar has the right of presentation to the perpetual curacy of Pinner, which is ecclesiastically dependent on Harrow, and is of the yearly value of £106. Harrow and Pinner are in the peculiar jurisdiction of the archbishop of Canterbury. There were in the parish, in 1833, three infant or dame schools, with 93 children; four day-schools, supported by subscription, with 197 children; two boarding-schools, with 76 children; and four Sunday-schools, with 409 children.

Twickenham is in Isleworth hundred, on the bank of the Thames, three miles from Hyde-park Corner. It has derived celebrity from its being the residence of Alexander Pope and several other eminent persons. The parish has an area of 2440 acres, with a population in 1831 of 4571. The village is a large one, and contains several rich houses, of which one is The Russell, Charles Russell, Esq., a church. The church is near the river, and is a plain brick structure, built in the early part of the last century, with an ancient embattled tower. It contains monuments erected by Pope to the memory of his parents, and by bishop Warburton, who has granted a lease of the roof of the church to the present vicar, and which is inhabited by the vicar, and other Episcopal clergy, at which the king James I. was a moderate, and the lords of the council were auditors. Charles I. resided here during part of his confinement, and Kings. and James I. made it their occasional residence. William III. rebuilt it, and it forms a part of the palace, and laid out the gardens and park in their present form. Since the time of George II. it has not been the abode of royalty, and is now occupied by private families who have granted a lease of the house and park to the king. The number of residents, including servants, is stated to be 700. The palace consists of three principal quadrangles, with some smaller courts. The chapel, the great hall, and some of the subordinate chambers and domestic offices are still used by the royal family, and converted into apartments by the government for nurses and other. The Pipes are held by private families. The house contains a number of pictures by the old masters, and the cartoons of Raphael constitute its chief treasure. The gardens contain several avenues and fine clumps of trees. Bushey Park and lodge are an appendage of Hampton Court Palace; the lodge was the residence of William IV. when duke of Clarence, and now belongs to the queen dowager for her life.

The village of Hampton has some substantial houses and handsome villas; among the latter is that which belonged to Garrick. Hampton races are held on Mousley Hurst, on the opposite side of the Thames. The living of Hampton is a vicarage of the clear yearly value of £362., with a glebe-house. Hampton Wick is a chapelry of the clear yearly value of £867, in the gift of the vicar of Hampton. There were, in 1833, in the whole parish, nine day-schools (one endowed and one school of industry), with about 350 children; seven boarding-schools, with 94 children; and three Sunday-schools, with 76 children.

Hammermire is in Kenton division of Oswestry hundred, 4 miles from Hyde-Park Corner. It is a portion of Hammermire, a dependency of Fulham parish, has an area of 2140 acres, with a population, in 1831, of 10,222. The principal street extends nearly two miles along the western road, and consists of several ranges of good modern houses. An elegant suspension bridge spans the Thames at this place. There are two churches: one erected in 1631, a spacious brick building; the other a Doric edifice, built within the last few years. The Dissenters have several places of worship, and the Catholics have a chapel. The only notable building is the Budget House, a villa erected by Sir Nicholas Crisp in the seventeenth century, and improved by subsequent occupants, was the residence of the late queen Caroline during her last abode in England. She died here, and her body was interred in the churchyard. There are large nursery-yards in the parish, and brick-making is extensively carried on.
mersmith is of the clear yearly value of 310£. There were in the chapel, in 1832, an endowed school called 'The Grammar School,' with 80 boys; a charity school for 50 girls, a school of industry with 57 girls, three other charity schools (one of them supported by Catholics), with 90 children; twenty-nine other day-schools, with 572 children; eight boarding-schools, with 266 children; and eight Sunday-schools, with 372 children.

Fulham, 4 miles from Hyde-park Corner, is in the same hundred and division as Hammersmith. The parish, exclusive of the chapelry of Hammersmith, contains 17,330 acres; in 1611, the population, in the scene of some military movements in the war between Charles I. and the parliament, A.D. 1642; and in 1647 the council of officers and agitators sat at Fulham and Putney (a village in the parish of Putney Heath, to the west of London), to overhaul the parliament and watch the king, who was then in confinement at Hampton Court. The village contains many good houses and villas; the manor-house is the residence of the bishop of London. The church is of stone, and has a stone tower in the decorated English style. There is a proprietary chapel, built by Richard Hunt, Esq., A.D. 1813, between Fulham and Hammersmith.

The bridge over the Thames at this place is of wood. The market for wool is held in the parish, which are noted for the growth of asparagus. The living is a vicarage of the clear yearly value of 1135£, in the gift of the bishop of London. There were in the parish, in 1833, two infant schools, with 159 children; two national schools, with 253 children; one charity-school, with 21 children; and one Sunday-school, with 17 children.

Kensington, in the same division and hundred as the preceding parishes, is now a suburb of London. The parish, with the extra-parochial chapel of Twyford, has an area of 2980 acres, with a population, in 1831, of 20,942. Part of the chapel of Knightsbridge is in Kensington parish. The principal street of the parish is Kensington Gore, and ranges of well-built houses extending along the great western road; and there are other streets. Brompton and Little Chelsea, on the south, and Kensington gravel-pits, on the north, are in the parish. There is at Kensington a royal palace, built on the site of a residence belonging to the family of Finch, earls of Winchelsea and Nottingham, from whom it was purchased by William III. That prince converted the dwelling-house into a palace, rebuilding the principal parts, and making many additions to it, which succeeding princes have augmented. The palace is of red brick, ornamented with columns and coigns of stone, and consists of three principal quadrangles. The suites of apartments are noble and extensive, and furnished with pictures by Flemish and English artists. The gardens and grounds, which are agreeably laid out, are three miles in circuit. There are barracks for detachments of the guards. Several members of the Royal Family have apartments within the palace. Holland House, an ancient mansion, chiefly in the Elizabethan style, was the residence of Addison, who died here; and much of the early life of Charles James Fox was passed here. It is now the residence of Lord Holland: it contains some interesting portraits. Campden House is another ancient residence in the same style. Kensington Church, a large modern brick building, is near the principal street: new churches have been erected in Addison Road and at Brompton, and there is a chapel-of-ease at Brompton, erected in 1818, and maintained. There are also Catholic churches. The living is a vicarage, of the clear yearly value of 142£, with a glebe-house. To the new churches in Addison Road (St. Barnabas) and Brompton (Trinity Church) are annexed curacies. The respective value of the parishes is 405£, and 639£, in the gift of the vicars of Kensington.

There were, in 1833, five infant or dame schools, with 44 children; a national school, with 290 children; a school for 17 girls, supported out of the parish rates; two schools supported by voluntary contributions, with 104 children; twenty-three other day-schools, with 489 children; forty-nine boarding-schools, with 827 children; and three Sunday-schools, with 265 children. There are also two proprietary grammar-schools, with about 160 children.

The parishes of St. Marylebone (pop. in 1831, 122,206), St. Pancras (pop. 103,548), and Paddington (14,540), in the Holborn division of Osolnon hundred, constitute the parliamentary borough of Marylebone. They are in the most part united to London. [LONDON.] The parishes of Camden Town and Kentish Town, and part of the village of Highgate, are in St. Pancras parish. Camden Town consists of some streets of good houses; and Kentish Town of some streets of bad houses, and of dissenting meeting-houses. There is a veterinary college at Camden Town. The Regent's Canal passes between these two hamlets. Hampstead is on high ground, 4 miles from Holborn Bar, in the parish of St. Pancras. The suburb, which contains 2070 acres, with a population, in 1831, of 3840, was separated from that of Hendon in 1858. It contains the village of Hampstead and the hamlet of Kilburn. The village of Hampstead contains mineral springs, once in considerable repute. The salubrity of the air, the plesantness of the prospect which, from its elevated situation, it enjoys, have made it a favourite place of residence: on the hill, north-east of the village, is an extensive small park. The water is used for supplying Camden Town and the adjacent parts with water. The church, which is of brick, was built about the middle of the last century. There are two proprietary Episcopal chapels, and several dissenting places of worship. The living is in the gift of Richard Dibdin, with 740 children; three charity-schools, with 44 children; two attached to the Established Church, and one supported by Roman Catholics; and two other schools, with 227 children; nine other day-schools, with 316 children; seven boarding-schools, with 389 children; one day and Sunday school (at Kilburn), with 85 children; and five Sunday-schools, with 583 children.

Islington, one mile north of Hick's Hall, the greatest and most populous part of the borough of Osolnon hundred, and included in the metropolitan parliamentary borough of Finsbury. The parish has an area of 3230 acres, with a population, in 1831, of 37,316. The principal street, under the designations of High Street, Upper Street, and Holloway, runs for several miles along the north road to the foot of Highgate Hill. Lower Street branches off from High Street, and runs towards Newington Green and Stoke Newington. The Liverpool Road forms a back road to Holloway; the new north road, and the road from King's Cross to Holloway, have been laid out within the last twenty years. Highbury, Canonbury, Bell's Pond, and Holloway, are portions of the village, which comprehends a number of ranges of good houses. A new place is named after the various streets which are built in the vicinity of the new river. The river canal is carried by a tunnel under the High Street, which is on an eminence, and under the new River. A considerable part of the parish is occupied as pasture-land by cow-keepers, who supply the metropolis with milk. There are some nursery grounds, and one or two markets, together with lime and coal wharfs, in the part adjacent to the Regent's Canal. The church is situated between Upper and Lower streets, and is of brick, with a tower of the same materials, surrounded by a handsome spire of good design. There is a chapel-of-ease at Lower Holloway, a pleas and rather heavy brick building, built A.D. 1814; and there are district churches at Upper Holloway (St. John's, a neat building, with a square embattled tower, crowned with pinnacles), Hackney, and at Stoke Newington. The Regent's Canal is carried by a tunnel under the High Street, which is on a line of young men for the ministry among the Independents. The Caledonian Asylum is a handsome building, on the road on the east side of the town. The Regent's Canal is a waterway; the Tilling, a road. Campden House, a heavy square brick building, is a residence of Canonbury House, the former mansion of the priors of St. Bartholomew's Monastery in Smithfield, and has been the residence of Lord Goldsmith, Chambers, author of the Cyclopaedia, and of other persons of literary celebrity. Islington is a vicarage, of the clear yearly value of 1135£, the perpetual curacies are of the following clear years...
value;—Lower Holloway Chapel, 351f.; St. John's, Upper Holloway, 256f.; St. Paul's, Bala's Pond, 335f.; and Trinity, Clapham. Of the chapels in Hampton there is no return. There were, in 1833, four infant-schools, with 578 children; thirty-eight boarding-schools, and sixty-one day-schools, among which were included three national schools, with 362 children; three other charity schools, con-
necting with the Established Church, with 422 children; and the Lancasterian school, with 160 girls; a school for industry for 32 girls, and three other charity schools, with 260 children. There are a proprietary school for 165 boys, and nine Sunday-
schools. In the Orphan Asylum 43 children are maintained and educated, and in the Caledonian Asylum about 100. There is a Literary and Scientific Institution.

Hornsey is in the same hundred and division, north of Islington. The area of the parish is 2960 acres; the population, in 1833, was 4856. It contains the village of Horn-
sey, and the hamlets of Crouch End, Muswell Hill, and Stroud Green. Few villages near London have re-
tained a more rural character than Hornsey. It lies in a valley out of the great thoroughfares; the New River passes close to it. The church, which is of stone, has been recently restored or rebuilt all but the tower, which is more ancient. There were, in 1833, two national schools at Hornsey, and Hornsey and Islington, supported by subscription, or, of the clear yearly value of 493s., with a glebe-house.

Highgate is on high ground on the great north road, 4 miles from London. Part of the village is in the parish of St. Pancras, and part in Hornsey parish. The village, when approached from the north, presents a Picturesque view of the top of a hill. A new church has been lately built, and a new school-room for the endowed grammar-school, which was founded by Chief-Justice Choimeley in the reign of Queen Elizabeth. The master has a good salary and a house. There are some almshouses at Highgate, and one or two dissenting places of worship. Some ponds at Highgate contribute to supply part of the northern suburbs of the metropolis with water.

The church of Hornsey was built on a steep declivity at Highgate, a project which was begun in 1609 for carrying the north road through a spacious arched tunnel. The work was commenced; but in 1812 the earth over the tunnel fell in, the plan of a tunnel was given up, and a road was cut through the hill. A road which crosses the north road is carried over it by means of an archway of brick and stone. An extensive ce-
metery has lately been formed at Highgate, on the slope of the hill just below the church: the grounds are well laid out, and it is a pleasant place for a walk and for the contempla-
tions. There are numerous catacombs in this cemetery. There were in Choimeley's grammar-school, in 1833, 33 boys; in another endowed school 26 pupils; and in a national school, 56 boys. A room for a national school for 140 children was erected in 1841.

Hackney is 2 miles from Shoreditch church, on one of the branches of the Norfolk and Suffolk roads. The parish has an area of 3290 acres, with a population, in 1831, of 33,467, all inhabited. The villages or hamlets of Hack-
ney, Homerton, Upper and Lower Clapton, Stamford Hill, Dalston, Shackwell, the greater part of Kingsland, and a part of Stoke Newington. Hackney, properly so called, has one principal street, known as Mare Street and Church Street, and some other streets, containing many good houses, some old and some of old date, for this was one of the earliest

places of rural retirement to the wealthy merchants and traders of London. The church was rebuilt near the close of the last century; it is a large building devoid of external beauty, but its internal construction and arrange-
ments have been the subject of much commendation. It has a stone tower of modern erection, but as this was insufficient
to bear the bells, the tower of the former church has been allowed to remain in the churchyard, which is spacious and pleasantly laid out. South Hackney church, originally built as a chapel-of-ease, but since made a district church, has but little architectural beauty. Homerton adjoins Hackney on the north-east, and consists of one street, half a mile long, leading to Blackfriars Road, and has a large Wesleyan Meth-

odist Episcopalian chapel, and a college rebuilt a few years since for the education of Congregational ministers. Clapton lies north of Homerton, and Stamford Hill north of Clapton. There are at Clapton a neat infant school, with 57 children, and a handsome building erected for the London Orphan Asylum. At Stamford Hill is an Episcop-
streets and squares, are several ranges of small houses. Stephen's is the building of stone and dintel, probably erected in the 14th century. A new church was erected in the parish in the year 1822. There is at Stepney a college or academy for the education of ministers among the Calvinists or Particular Baptists. Along the Mile End Road and Whitechapel Road is a chain of almshouses; of which the principal are the Jews' Hospital, Bancroft's almshouses, and those belonging to the Trinity House. Limehouse is one of the most ancient in the reign of Queen Anne. Poplar chapel is a neat structure, almost entirely rebuilt in the latter part of the 18th century. St. Mary's, East India Dock, Hospital, in connection with this chapel, contains a dwelling for a chaplain, and for the widows of officers and seamen in the Company's service.

The two parishes are chiefly inhabited by seafaring people, or by those engaged in the building or fitting out of vessels. They contain the East India Docks and the West India Docks, and the basin at the junction of the Regent's Canal with the Thames. There are ship-building yards and ropewalks, also manufactories for anchors and chain cables, sail-cloth, ships' blocks, &c. The Regent's Canal and a cut from the river Lea to the Thames cross this parish. A tramroad leads along the south side of the Commercial Road from the West India Docks to Whitechapel: and a railway runs from Mile End to the city of Westminster.

The living of Stepney is a rectory, of the clear yearly value of £110 13s. 4d. with a glebe-house. There is a chapel attached to the new church, of the clear yearly value of £21 10s. Poplar is a deanery, of the clear yearly value of £32 10s. 4d., with a glebe-house. Limehouse is a rectory, of the clear yearly value of £71 14s.

The parish of Stepney was once much more extensive than at present: those of St. Paul, Shadwell; St. Mary, Whitechapel; St. John, Wapping; St. Mary, Stratford-le-Bow; Christchurch, Spitalfields; St. George's in the East; St. Ann's, Limehouse; and St. Matthew, Bethnal Green, have been formed by separation from it. Had the parish retained its former extent, the population in 1831 would have been nearly equal to that of Stepney and Limehouse combined.

Stepney and Limehouse parishes contained, in 1833, three infant schools, seventy-three day-schools, and eighteen Sunday-schools. Of the day-schools, the principal are, Bancroft's school, consisting of 100 boys who are boarded, clothed, and instructed; the Jew's Hospital, for the employment and education of youth, with 58 children; Stepney proprietary school, with 120 boys; an endowed free-school under the management of the Cooper's company, with 35 boys; and several charity schools. There are several dissenting congregations.

The parishes described above, from Hackney inclusive, are in the Tower division of Osulottan hundred, which is comprehended in the new metropolitan parish of Stratham and Stamborough.

Divisions for Ecclesiastical and Legal Purposes.—This county is included in the diocese of London, and is divided between the archdeaconries of London and Middlesex. The City of London within and without the walls (with the exception of thirteen parishes which are peculiarities of the archbishopric of Canterbury, one parish which is a peculiar of the bishopric of London, and four parishes which are in the peculiar jurisdiction of the dean and chapter of St. Paul's), the parishes of St. James, Clerkenwell, St. Leonard, Shoreditch, and St. Mary, Islington, and the precincts of Portpool, Hoxton, Norton Folgate, and Goswell-street, constitute the archdeaconry of London. The rest of the county (with the exception of these parishes) are in the peculiar jurisdiction of the bishop of London, save those which are in the peculiar jurisdiction of the dean and chapter of St. Paul's, and two which are peculiar of the archbishop of Canterbury) is included in the archdeaconry of Middlesex.

This division may have its chaaras in the county, when Newcourt drew up his account of the diocese, as was follows:—

In London:

<table>
<thead>
<tr>
<th>Archdeaconry</th>
<th>Parishes</th>
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<tbody>
<tr>
<td>Under the archdeacon of London</td>
<td>72</td>
</tr>
<tr>
<td>Under the archdeacon of Middlesex</td>
<td>3</td>
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In the rest of Middlesex:

<table>
<thead>
<tr>
<th>Archdeaconry</th>
<th>Parishes</th>
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<tbody>
<tr>
<td>Under the archdeacon of Middlesex</td>
<td>3</td>
</tr>
<tr>
<td>Under the archdeacon of Canterbury</td>
<td>2</td>
</tr>
</tbody>
</table>

Total | 88

Since Newcourt's time the number of ecclesiastical divisions and benefices has considerably increased, through the subdivision of the larger parishes near London, such as Stepney, Hackney, Islington, St. Pancras, and St. Marylebone.

The county is, in civil suits, within the immediate jurisdiction of the superior courts sitting in the metropolis. In criminal cases of the more important class it is within the jurisdiction of the Central Criminal Court, held in the Old Bailey in London. Sessions, at which lighter criminal offences are tried, are held at the Sessions House, Clerkenwell, twice in the year, and at Guildhall, for the city of London. There are 14 sessions held in the year. Records for Westminster. The city is under the police jurisdiction of its own aldermen: other parts immediately round London have police-offices, with stipendiary magistrates. Police not distant from London are under the county magistrates.

The shrievalty of Middlesex is united with that of London. Two sheriffs are annually chosen by the Livery of London in common ball. London has a body of police of its own: the suburbs are watched by the metropolitan police, a numerous body of men under the direction of two commissioners.

Fourteen members of parliament are returned from Middlesex, namely, two for the county, four for the city of London, and eight for the new metropolitan boroughs of Marylebone, Finchbury, and the Tower Hamlets. The borough of Marylebone comprehends the three parishes of St. Marylebone, St. John's, and St. Mary's, Paddington; and that of Finchbury the liberties in the Finchbury division of Osulottan hundred; and that of the Tower Hamlets, the liberties of the Tower and the Tower division of Osulottan hundred.

History and Antiquities.—In the earliest period of authentic history, the part of Middlesex west of the waters included in the counties of Flavia Caesarensis, and contained the stations of Londinium, Pontes (according to some), and Sulloniacum. Of Londinium [London] nothing need here be said. Pontes has been variously fixed, at Colnbrook and at Stanmore, or near Berkhamsted and in Middlesex. Sulloniacum was at Brockley Hill, between Edgware and Elstree. There, or were till lately, traces of Roman camps at Stanmore, in the fields near Islip, and at Shepperton, near the place where Caesar crossed the Thames. The Roman Watling Street ran from London through Sulloniacum to Verulamium (near St. Alban's). Ermine Street ran from Londinium northward by Stuke Newington to Enfield, and other roads led from London to the southern parts of England, and across the Lea to Essex. Of this last fragment of a stone causeway in the marshes of the Lea, between Hackney Wick and Old Ford, may be regarded as a remain. The Thames was known to the Romans by the names Tamnesia and Jamias. The Roman names of the Lea, the Colne, and the Brent, are not known.

Beside various Roman antiquities found in London, others have been discovered in various parts of the county. At Bentley near Stannmore fifty gold coins and several silver rings have been found. At Surlingham, near the meadows, a bracelet, all of gold. Coins, urns, or other Roman antiquities have been dug up at Hampstead, Shepperton, and Tunbridge near Brentford.

In the division of the island this county is generally considered to have been a part of the kingdom of the East Saxons; but we think this may be questioned. Sir F. Palgrave has shown that among the Saxons states there were more than seven or eight which were properly distinct from one another. Although they were called the East Saxons in subjection by their more powerful neighbours, the "East Saxons," in the Family Library of England (Anglo-Saxon Period), in the Family Library. Of these petty kingdoms or states we consider Middlesex (the territory of the Middle-Saxons) to have been one; for we do not think the name would have been given had it been a sea-land, according to the common opinion, only a frontier.
district of the East-Saxon kingdom. It may have been governed occasionally by the kings of Essex,—it is known that the East Saxons parted from the rest of the nation at the city of London; but Essex was itself little more than a dependency of Kent, and never enjoyed a period of political independence. It favours our supposition that Middlesex was not a mere province or county of the East Saxons, but the only portion of England under Alfred, while the county of Essex and part of Hertfordshire were included in the Danelagh, or Danish territory, London and the rest of Middlesex were placed under the alderman of Essex, (Rise and Progress of the English Commonwealth, vol. ii. p. 166, pp. xxiii., ccxxx., etc.) It is however to be observed that some early authorities make Middlesex a part of the Danelagh. (Sir F. Palgrave, Ind., p. 64, 572.)

Saxo says that the Saxons sustained with the Danes. London was repeatedly taken by that people. In the great struggle between Alfred and the Danish chieftain Hastings the citizens bore a distinguished part. In the reign of Athelstan, London became the occasional residence of the king. In A.D. 1013 London submitted to the Danes under Swein or Sweyne, Ethelred II., whom they had endeavoured to support, having fled. In the following year the citizens threw off the Danish yoke, and recalled Ethelred. In the reigns of Edmund II. and Æthelred, London was ruled by the Danish king Canute, who, after continuing some time, on the approach of Edmund. A battle between the rival princes was fought the same year at Brentford, the issue of which enabled Canute to resume the government. On it the citizens suffered some damage, the frequent death of Edmund however brought the whole island under the sway of Canute.

London, having become, under the later Saxon princes or under the Norman dynasty, the seat of government, was the scene of many events which belong not to the period, but to the general history of the country. In A.D. 1189, at the coronation of Richard I., there was a dreadful massacre of the Jews by the populace at Westminster. In A.D. 1196 a great tumult arose in London, headed by William Pecock, and led by Stephen, A.D. 1212, London was much damaged by a great fire. In the civil wars of John the citizens took the side of freedom. The Great Charter was signed by that king close upon the border of the county, between Stanmore and Windsor. In the subsequent war against the king, the citizens supported the cause of the dauphin Louis, who was however ultimately shut up in London, and compelled to relinquish his attempt on the kingdom. In A.D. 1222 another tumult of the Londoners took place against the king, and the city was issued from the city and burned. In A.D. 1264, eighteen of the insurgent barons. They burned the palace of the King of the Romans at Isleworth, and a summer-house belonging to the king at Westminster. On the suppression of this insurrection, after the battle of Evesham (A.D. 1265), the citizens were compelled to purchase exemption from the loss of their privileges by heavy payments. Just before the breaking out of this insurrection there was a great massacre of the Jews in London. In the year 1267 the city was occupied by the Earl of Gloucester, who repelled for a time the king's army. He was however obliged to submit.

In the civil wars of Edward II. the city was first threatened and then occupied by the insurgent barons, A.D. 1320. At a subsequent stage of the troubles, A.D. 1322, on the accession of the young king, two dozen of the leaders, were put to death by the populace. In the subsequent reign of Edward III. a considerable tumult was excited on occasion of Wilcliffe being cited before a synod at St. Paul's. In the days of Edward IV. and Lord Percy, earl-marshal, afterwards well known as the earl of Northumberland, supported Wilcliffe, while the citizens supported the bishop of London, whom they supposed to be threatened by those nobles. This tumult had almost cost the city its most valuable possession, that is the city hall and aldermen, on the plea that they had not properly exerted themselves to put the citizens down.

The rising of the Commons under Wat Tyler, A.D. 1381, belongs to the history of England. In 1387 the earls of Warwick and Arundel and the duke of Gloucester assem-
he captured. On this, the trained bands and other forces under Essex marched to Turnham Green, but no battle was fought, and the king soon quitted the county. In A.D. 1643 the cities of London and Westminster with Southwark were surrounded by defensive works of great extent, which were demolished by order of parliament, about four years afterward. In 1646 the conferences for peace at Uxbridge were held. In 1648 a tumult arose in the city, and the rioters were not put down until after some bloodshed; and in 1649 Charles I. was beheaded.

In 1661, after the Restoration, London was again made the scene of tumult by the Fifth Monarchy-men under Venner. The great plague of London in 1665, and the great fire of 1666, are events well known; also the great agitation of the metropolis during the supposed discovery of the popish plot. The attempts upon the city charters and the severe penalties inflicted upon some leading citizens in the closing years of Charles II. and in the reign of James II. are also well known.

In the year 1668 James II. formed a camp on Hounslow Heath; but his army, partaking of the national feeling deserted him. In A.D. 1710 London was much agitated by the trial of Dr. Sacheverell. In the rebellion of 1745, a camp was formed on Finchley Common, and the city trained bands and county militia were kept in readiness to march. In 1789 London was the scene of destructive riots, occasioned by popular hatred to Catholicism. In 1815 there were some tumults on account of the corn-laws, and a few years afterwards on account of reform in parliament. Since then there has been no event in the history of the county of sufficient importance to be noticed here. ( Beauties of England and Wales; Ordnance Maps; Conybeare and Phillips's Outlines of the Geography of England and Wales; Parliamentary Papers.)

### Statistics.

**Population.**—Middlesex, as containing the great metropolis of the United Kingdom, of course cannot be compared with any other county of England, the population in proportion to its surface being vastly greater; the population of the other part of the county not included in the metropolis is not a fourteenth of the whole. As an agricultural county Middlesex therefore ranks very low, being the 42nd, or the very lowest in the scale. Of 358,521 males twenty years of age and upwards, living in 1831, only 12,516 were engaged in agricultural pursuits, and 11,064 in manufactures or in making manufacturing machinery. In this matter number is not included that numerous class of workmen of the best kind in all descriptions who are employed in London for combining, fitting, and finishing all the commodities requisite for the consumption and vast commerce of the metropolis. Workmen so employed are classed and specified in the detail of trades and handicrafts to the amount of four hundred different kinds. Independent of these, the manufactures of Middlesex are not of importance. More than 3000 males twenty years of age and upwards are employed in the manufacture of silk at Bethnal Green and its neighbourhood. At and near Whitechapel 440 men are employed in sugar-refinery. At Limehouse, sail-choils and chain-cables are made; cramp and oiled leather at Enfield; copper-works exist at Harefield, and mustard-mills at Staines.

The following table contains a summary of the population, &c. of every hundred, as taken in 1831:

<table>
<thead>
<tr>
<th>HUNDREDS, CITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOROUGH:</td>
</tr>
<tr>
<td>House.</td>
</tr>
<tr>
<td>Houses.</td>
</tr>
<tr>
<td>Inhabited.</td>
</tr>
<tr>
<td>Families.</td>
</tr>
<tr>
<td>Building.</td>
</tr>
<tr>
<td>Uninhabited.</td>
</tr>
<tr>
<td>Families chiefly employed in trade, manufactures, &amp;c.</td>
</tr>
<tr>
<td>Families chiefly employed in trade, manufactures, &amp;c. and handi-</td>
</tr>
<tr>
<td>crafts.</td>
</tr>
<tr>
<td>All other families not com-</td>
</tr>
<tr>
<td>piled in the two preceding classes.</td>
</tr>
<tr>
<td>Males.</td>
</tr>
<tr>
<td>Females.</td>
</tr>
<tr>
<td>Total of persons.</td>
</tr>
<tr>
<td>Males, twenty years of age.</td>
</tr>
</tbody>
</table>

| EDMONTS | 5,616 | 79 | 339 | 339 | 1,620 | 2,141 | 12,969 | 13,011 | 26,930 |
| ELLIS | 6,516 | 3,701 | 2,432 | 220 | 1,248 | 1,505 | 1,471 | 9,998 | 10,043 | 20,041 |
| GORE | 3,694 | 82 | 754 | 754 | 619 | 636 | 5,697 | 5,697 | 11,394 |
| LEWIS | 2,454 | 43 | 151 | 151 | 756 | 1,159 | 6,515 | 7,063 | 13,578 |
| OSWALD | 4,801 | 4,516 | 644 | 644 | 2,049 | 2,049 | 827 | 1,824 | 3,085 |
| FINSBURY | 36,534 | 36,534 | 36,534 | 36,534 | 4,898 | 4,898 | 46,496 | 81,496 | 128,249 |
| HOLLAND | 5,314 | 2,514 | 2,514 | 2,514 | 2,514 | 2,514 | 2,514 | 2,514 | 2,514 |
| KENT | 5,114 | 5,114 | 5,114 | 5,114 | 5,114 | 5,114 | 5,114 | 5,114 | 5,114 |
| LONDON | 7,176 | 7,176 | 7,176 | 7,176 | 7,176 | 7,176 | 7,176 | 7,176 | 7,176 |
| SPOLESTON | 2,715 | 2,715 | 2,715 | 2,715 | 2,715 | 2,715 | 2,715 | 2,715 | 2,715 |
| LONDON WITHOUT THE WALLS | 8,602 | 8,602 | 8,602 | 8,602 | 8,602 | 8,602 | 8,602 | 8,602 | 8,602 |
| LONDON WITHOUT THE CITY | 10,733 | 10,733 | 10,733 | 10,733 | 10,733 | 10,733 | 10,733 | 10,733 | 10,733 |
| WESTMINSTER CITY | 20,616 | 20,616 | 20,616 | 20,616 | 20,616 | 20,616 | 20,616 | 20,616 | 20,616 |

| MILITIA UNDER TRAINING | 180,000 | 180,000 | 180,000 | 180,000 | 180,000 | 180,000 | 180,000 | 180,000 | 180,000 |

The population of Middlesex, at each of the four following periods, was:

<table>
<thead>
<tr>
<th>Period</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1801</td>
<td>373,565</td>
</tr>
<tr>
<td>1811</td>
<td>344,474</td>
</tr>
<tr>
<td>1831</td>
<td>610,965</td>
</tr>
</tbody>
</table>

The sum expended for the same purpose for the year ending March, 1838, was £383,076 1s.; and assuming that the population had increased at the same rate of progression as in the ten preceding years, the above sum gives an average of nearly 5½s. for each inhabitant. This average is below that for the whole of England and Wales.

The sum raised in this county for poor-rate, county, and other local purposes, in the year ending 25th March, 1833, was £986,742 19s., and was levied upon the various descriptions of property as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>£658,333 13s.</td>
</tr>
<tr>
<td>Dwelling-houses</td>
<td>£832,345 15s.</td>
</tr>
<tr>
<td>Mills, factories</td>
<td>£57,592 2s.</td>
</tr>
<tr>
<td>Manorial profits, navigation</td>
<td>£15,290 9s.</td>
</tr>
</tbody>
</table>

Total £968,724 19s.
The total number of committals in each of the same years was 1707, 1701, and 2977 respectively.

1831. 1832. 1833.
Number convicted 293 342 1368
Acquitted 109 105 239
Discharged by proclamation 1305 1254 1370

In 1838 there were 3488 persons charged with crimes at the assizes and sessions in Middlesex. Of these 329 were charged with offences against the person, 204 of which were common assaults; 130 were charged with offences against property committed with violence, and 2740 with offences against property committed without violence. Of the remaining 4 were charged with arson; 143 with forgery, and with uttering counterfeited coin; 11 with perjury, 27 for riot, and 84 for various other misdemeanours.

Of the whole number committed, 2578 were convicted, 625 were acquitted, 29 were not prosecuted, no bill was found against 246, and 10 were found insane. Of those convicted, 4 were sentenced to death, not one of whom was executed; the sentences against them being commuted to transportation for various periods: of the remaining offenders, 22 were transported for life, 2 for fifteen years, 86 for ten, and 707 for seven years. Sentence of imprisonment for 3 years, or above 2 years, was based on 3; 70 were imprisoned for 2 years, or above I year; 193 for 1 year, or above 6 months; and 1365 for 6 months or under: 126 were fined. Of the whole number of offenders, 2663 were males and 825 females; 919 could neither read nor write, 1818 could read and write imperfectly, 682 could read and write well, 7 had received superior instruction, and the degree of instruction of the remaining 62 could not be ascertained.

The number of persons qualified to vote for the county members, and registered, in 1837, was 12,817. Of these, 9485 were freeholders, 1065 leaseholders, 975 copyholders, and 1295 occupying tenants, being one in 106 of the whole population, and one in 28 of the male population twenty years and upwards, as taken in 1831. The number of voters that voted at that election was 9214, viz. 6739 freeholders, 730 copyholders, 809 leaseholders, and 936 occupying tenants.

This county contains 27 savings’ banks; the number of depositors and amount of deposits on the 29th of November, in each of the following years, were as under:

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of depositors</th>
<th>Amount of deposits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1838</td>
<td>50,857</td>
<td>6,779</td>
</tr>
<tr>
<td>1839</td>
<td>53,247</td>
<td>10,809</td>
</tr>
<tr>
<td>1840</td>
<td>1,061</td>
<td>264,268</td>
</tr>
</tbody>
</table>

The various sums placed in the savings’ banks in 1836, 1837, and 1838, were distributed as under:

<table>
<thead>
<tr>
<th>Year</th>
<th>Deposits Deposited</th>
<th>Earthen Deposits</th>
<th>Deposits Deposited</th>
</tr>
</thead>
<tbody>
<tr>
<td>1836</td>
<td>4,314,300</td>
<td>8,500,000</td>
<td>1,200,000</td>
</tr>
<tr>
<td>1837</td>
<td>1,200,000</td>
<td>1,200,000</td>
<td>1,200,000</td>
</tr>
<tr>
<td>1838</td>
<td>1,200,000</td>
<td>1,200,000</td>
<td>1,200,000</td>
</tr>
</tbody>
</table>

Education.—The following is an abstract taken from the Education Returns laid before parliament in 1833:

<table>
<thead>
<tr>
<th>School</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant schools</td>
<td>109</td>
</tr>
</tbody>
</table>

Number of children at such schools:

<table>
<thead>
<tr>
<th>Age</th>
<th>Number of children</th>
</tr>
</thead>
<tbody>
<tr>
<td>to 2 years</td>
<td>3,065</td>
</tr>
<tr>
<td>3 to 7 years</td>
<td>2,441</td>
</tr>
<tr>
<td>Sex not specified</td>
<td>3,226</td>
</tr>
</tbody>
</table>

Daily schools:

<table>
<thead>
<tr>
<th>Age</th>
<th>Number of children</th>
</tr>
</thead>
<tbody>
<tr>
<td>to 2 years</td>
<td>2,152</td>
</tr>
</tbody>
</table>

Number of children at such schools:

<table>
<thead>
<tr>
<th>Age</th>
<th>Number of children</th>
</tr>
</thead>
<tbody>
<tr>
<td>to 2 years</td>
<td>49,991</td>
</tr>
<tr>
<td>3 to 7 years</td>
<td>34,446</td>
</tr>
<tr>
<td>Sex not specified</td>
<td>8,051</td>
</tr>
</tbody>
</table>

Schools:

<table>
<thead>
<tr>
<th>Name</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant schools</td>
<td>2,261</td>
</tr>
</tbody>
</table>

Total number of children under daily instruction: 101,220
Sunday-schools 329

Number of children at such schools:

<table>
<thead>
<tr>
<th>Ages from 5 to 15 years:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males: 23,440</td>
</tr>
<tr>
<td>Females: 23,225</td>
</tr>
<tr>
<td>Sex not specified: 5,456</td>
</tr>
<tr>
<td>Total: 52,121</td>
</tr>
</tbody>
</table>

If we assume that the population between the ages of 2 and 15 years had increased in the same proportion as the whole population since 1821, and that the whole population had increased from 1831 to 1833 in the same ratio as during the ten years preceding 1831, we find that the number of children between the ages of 2 and 15 residing in Middlesex in 1833 was 469,563. Only two Sunday-schools are returned from places where no other schools exist, wherefore it may be said that all Sunday-school children in this county are included.

The schools established by Dissenters, included in the above statements, are:

<table>
<thead>
<tr>
<th>Schools</th>
<th>Scholar.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant Schools 1,719, containing 67,158</td>
<td></td>
</tr>
<tr>
<td>Daily Schools 219 37,484</td>
<td></td>
</tr>
</tbody>
</table>

The schools established since 1818 are:

<table>
<thead>
<tr>
<th>Schools</th>
<th>Scholar.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant and other daily schools 1,719 containing 67,158</td>
<td></td>
</tr>
<tr>
<td>Sunday-schools 150 27,889</td>
<td></td>
</tr>
</tbody>
</table>

The ground through which it passed presented much difficulty from its diversity of bottom as well as level. In some places it was necessary to cut a channel thirty or forty feet deep; in others, to conduct the stream over a viaduct, while at other places it had to cross a height of twenty feet high; and a vast number of bridges were to be constructed for the accommodation of those through whose grounds the stream was carried.

The distance from London by the road is about twenty miles, but the whole course of the river is thirty-seven miles.

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The distance from London by the road is about twenty miles, but the whole course of the river is thirty-seven miles.

The plays written by Middleton are very numerous: those of the 'A Mad World', 'My Master', the 'Mayor of Cats', and the 'Roaring Girl', are in Dodgson's Collection, and the rest can only be procured separately. The 'Roaring Girl' is extremely valuable, as giving a picture of London manners in the author's time; it is interspersed with much of the most comic, and in Shakespeare's 'The Taming of the Shrew' and Fletcher's 'Beggar's Bush', and the heroine is a real character, the notorious Moll Cutpurse, who was introduced by Nat. Field, a contemporary dramatist, in his piece, 'Amends for Ladies.' A play of Middleton's, called 'The Witch', has gained celebrity from the circumstance that the Necessaries of all the parts, whole expenses of performance, and the revenue raised for it at Sadler's Wells, near Kenton, in the 'Biography Britannica', an interesting account is given of the event on this occasion, which was attended by the lord-mayor, the aldermen, the audience, and many of the principal citizens, the whole expenses, and the revenue raised for it at Sadler's Wells, near Kenton, in the 'Biography Britannica', an interesting account is given of the event on this occasion, which was attended by the lord-mayor, the aldermen, the audience, and many of the principal citizens, as well as a number of the lower orders. The stream was admitted into the reservoirs, and the revenue raised for it at Sadler's Wells, near Kenton, in the 'Biography Britannica', an interesting account is given of the event on this occasion, which was attended by the lord-mayor, the aldermen, the audience, and many of the principal citizens, as well as a number of the lower orders. The stream was admitted into the reservoirs, and the revenue raised for it at Sadler's Wells, near Kenton, in the 'Biography Britannica', an interesting account is given of the event on this occasion, which was attended by the lord-mayor, the aldermen, the audience, and many of the principal citizens, as well as a number of the lower orders. The stream was admitted into the reservoirs, and the revenue raised for it at Sadler's Wells, near Kenton, in the 'Biography Britannica'.

Sir Hugh Middleton was compelled to sell his shares, and to support himself by the profession of what is now called a civil engineer. On the 19th of October, 1622, he was created a baronet for the following reasons: the king by special warrant kindly excusing him from the payment of
the usual fine of 10s. 6d. —1. For bringing to the city of London, with excessive charge and greater difficulty a new cut or river of fresh water, to the great benefit and inestimable prosperity with 2. For gaining by very great and spacious quantity of land in Bridging Haven in the Isle of Wight, out of the bowels of the sea; and with banks and pyles and most strange defensible and chargeable mountains, fortifying the same against the violence and fury of the sea, to the ending out of a most incommodious skill, exceeding industry, and no small charge, in the county of Cardigan, a royal and rich mine, from whence he hath extracted many silver plates, which have been coined in the Tower of London, for current money in England.

W. W. j. C. showered. November 1, 1695. (Harleian Misc.) On the 18th of November, 1636, Charles I. re-
granted to Sir Hugh the whole of King James's shares for an annual rent of 500l. Middleton is supposed to have died later, leaving a numerous family in very indifferen
cious circumstances.

The springs near Ware are beautifully clear and very copious; but, a great many years ago, the supply having been found inadequate to the demands of the increased population, the New River Company entered into an agree-
ment with the Commissioners of the Lea River to take a portion of the Lea at Ware, which was conveyed at first through pipes, but some years afterwards it was agreed that there should be an opening made of six feet by two, which is still made use of. The water is now conveyed into the Lea River, and has done so for a great number of years; but an ample supply having been obtained from the Lea, it is presumed that the New River Company made no attempt to bring the spring being turned from its original course; the time however when it was done is not
certainly known.

The fall of the New River is three feet per mile, which gives a velocity of about two miles an hour. The average width is a yard and a half, but the river is from four to five feet in the centre; so that, taking at half the depth, there
is a section of forty-two square feet flowing to London at the rate of two miles an hour. At the sluice, near Highbury, the river is dammed back to the height of twenty inches, at Exmouth, to the height of four inches, and there are three or four more similar interruptions for the purpose of checking the current. This has been done because the Commissioners of the Lea complained that the New River Company, by enlarging the bridge, and taking off the bends of the river to bring it, more quickly to London, took more water than they were legally entitled to. They could take one-third more if they had the right; but not having enough, they have erected a steam-engine at Broken Wharf, which pumps the water out of the shape of a bell, and brings it directly into the main-pipe. To get rid of the engine at Broken Wharf the New River Company have tried, but hitherto, we believe, in vain, to get an act of parliament granting the right to take an additional supply from the Lea. They, accordingly, purchased a full hold in a cott tenham mill, together with fifty acres of ground, which they could convert into a reservoir.

The New River, especially in winter, is occasionally ren
dered dirty by drainage from the land and villages along its course, and the company have been at great expense to purify the water before it is delivered to the inhabitants of London. For this purpose two settling reservoirs were formed at Stuke Newington in 1832, under the direction of M. P. B. T., the Company's area, of thirty-eight acres, more than twenty feet deep in some places, and twelve feet on the average. A part or the whole of the New River can be turned into the upper reservoir, where it settles, and is then drawn off by a steam-engine, and conducted, as the case may be, into the lower reservoir, where settlement takes place, and the water is then turned again into the channel of the New River. Bathing in the New River is now entirely prohibited; and men called walk-men mow the bed of the river every week to keep down the growth of weeds. The total length of the River is about seven miles from each other, where the weeds are taken out.

The capital of the Company has been stated by themselves to be 1,696,126l., divided into 72 shares, or 14,26l. per share. The company is registered under the title of "The New River, or Metropolitan Water," printed by order of the House of Com-
mons, in August, 1834; by which it will be seen that the New River furnishes almost as much as the other seven companies united, supplying 70,145 houses (including large manufactories, breweries, &c.) with 16,905,000 gallons of water daily, at the average rate of 241 gallons per day to each house, at an average charge of less than 1d. per day.

<table>
<thead>
<tr>
<th>New River</th>
<th>70,145</th>
<th>241</th>
<th>16,905,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chelsea</td>
<td>13,892</td>
<td>168</td>
<td>2,334,000</td>
</tr>
<tr>
<td>Hoxne and Junction</td>
<td>359</td>
<td>3</td>
<td>10,770</td>
</tr>
<tr>
<td>West Middlesex</td>
<td>16,000</td>
<td>185</td>
<td>2,960,000</td>
</tr>
<tr>
<td>East London</td>
<td>46,421</td>
<td>152</td>
<td>7,051,000</td>
</tr>
<tr>
<td>South London</td>
<td>12,046</td>
<td>100</td>
<td>1,204,000</td>
</tr>
<tr>
<td>Lambeth</td>
<td>16,682</td>
<td>124</td>
<td>2,069,000</td>
</tr>
<tr>
<td>Southwark</td>
<td>7,100</td>
<td>166</td>
<td>1,105,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Houses daily</th>
<th>£ 6 d.</th>
<th>Totals daily</th>
<th>£ 6 d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>241</td>
<td>1 6</td>
<td>16,905,000</td>
<td>1 6  0</td>
</tr>
<tr>
<td>168</td>
<td>1 3 7</td>
<td>2,334,000</td>
<td>1 3 7</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>10,770</td>
<td>2  0</td>
</tr>
<tr>
<td>185</td>
<td>2 16</td>
<td>2,960,000</td>
<td>2 16</td>
</tr>
<tr>
<td>152</td>
<td>1 2</td>
<td>7,051,000</td>
<td>1 2  0</td>
</tr>
<tr>
<td>100</td>
<td>0 15</td>
<td>1,204,000</td>
<td>0 15</td>
</tr>
<tr>
<td>124</td>
<td>0 17</td>
<td>2,069,000</td>
<td>0 17</td>
</tr>
<tr>
<td>166</td>
<td>1 1 0</td>
<td>1,105,000</td>
<td>1 1 0</td>
</tr>
</tbody>
</table>

(Stow's Survey of the City of London: Biographies Brittanica; Nelson's History of Islington; Report on the Metropolitan Water, 1834.)

MIDDLETON, CONYERS, born August 2nd or December 27th, 1653, was the son of William Middleton, roctor of Hindewer, near Whiby in Yorkshire. At the age of seventeen he was sent to Trinity College, Cambridge, of which college he was two years afterward chosen a scholar. He took his degree of B.A. in 1702, and was shortly after ordained deacon. In 1706 he was elected a fellow of Trinity College; and in 1708, joined with other fellows of his college in the foundation of the Society for the visitation of the college, against Bentley the master. Middleton, who was then a young man, did not take a prominent part in this proceeding; but the feelings of hostility to the master excited by these disputes sank deep into his mind, and made him subsequently the most determined and dangerous of his enemies.

Middleton married soon afterwards, and resided for a short time in the Isle of Ely on a small living in the gift of the Archbishop of Canterbury, and continued to hold it until some time after 1717, which induced him to return to Cambridge at the end of a year.

When George I. visited the university of Cambridge in 1717, Middleton, with several others, was created Doctor of Divinity; but Bentley, who was Regius Professor of Divinity, he could not, on the ground of his dissenting opinions, be allowed to take the degree. The ambassador then, as he has been described to the visitor of the college, against Bentley the master. Middleton, who was then a young man, did not take a prominent part in this proceeding; but the feelings of hostility to the master excited by these disputes sank deep into his mind, and made him subsequently the most determined and dangerous of his enemies.

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master of the court, and paid by Trinity College, amounted to 150l. While this matter was pending, Bentley published Prosaia for a new edition of the Greek Testament, with a specimen of the intended work. The proposals and speci-
men were drawn up by candle-light one evening, according to Bentley's own confession; and, though the sheet had not been made up or paste, Middleton eagerly availed himself of the opportunity which the carelessness of his great enemy had afforded him, and accordingly published a severe critique upon it, in a pamphlet entitled 'Remarks, particularly upon some of the proposals lately published by R. Bentley for a new edition of the Greek Testa-
ment,' and followed up his attack by 'Some further Remarks' a few weeks afterwards. Although Middleton pro-
fessed, in the commencement of the pamphlet, that his resignation, from him out of his personal spleen or envy to the author of the Proposals, but by a serious con-
viction that he had neither talents nor materials proper for the work he had undertaken, and that religion was much more likely to receive detriment than service from it, he nevertheless consecrated to the lowest abuse against his antagonist; but it must be allowed that in this respect he was hardly a match for the master of Trinity.

As Middleton had been put to great expense and trouble by this first proposal, his friends, the university, not with-
standing his sufferer in a public cause, resolved to bestow some public mark of distinction upon him, and ac-
cordingly established a new office of principal librarian, to which Middleton was elected notwithstanding the violent opposition of the Court of Exchequer. Shortly afterwards he published a plan for arranging the university library, which was entitled 'Bibliotheca Cantabrigiensis Ordinanda: Methodus quaedam,' 1723; in the dedication of which to the vice-chancellor he expressed himself in a manner which appeared to call in question the jurisdiction of the Court of King's Bench; for which he was again prosecuted by Bentley, and condemned to pay a fine of 50l.

Having lost his wife shortly after this, he travelled on the Continent, and spent some time in Rome in 1725.

On his return to England, he renewed his suit against Bentley for the recovery of the four guineas, which at length paid the money to Middleton in 1725. In 1726 he published a short treatise 'De Medicorum apud veteres Romano
degentium Conditione Dissertation; qua &c. servilem atque ignoblemens cae suaestenditur;' which was con-
cidered an insult upon the whole medical profession. Several pamphlets were published in answer to it, to which Middle-
ton replied in the following year.

Davies published his celebrated 'Letter from Rome,' in which he attempted to show that 'the religion of the present Romans was derived from that of their heathen ancestors,' and that in particular the rites, ceremonies, dresses of the priests, &c. in the Roman Catholic church were taken from the pagan religions; and his work was re-
ceived with the greatest favour by the learned, and went through four editions in the author's life-time; but the free manner in which he attacked the miracles of the Roman Catholic church gave offence to many divines of his own communion, who suspected and maintained that the author had as little respect for the miracles of the apostles as for those of the Roman Catholic saints. This suspicion was confirmed by his next publication in 1731, which was a letter to Dr. Waterland, containing some remarks on Wa-
terland's reply to Tindal's attack upon revealed religion, in a work written by the latter, which was entitled 'Chris-
tianity as old as the Creation.' This letter, which was first published anonymously, but was signed to be written by Middleton, gave the greatest offence to the clergy of Oxford, and its reception in the local press was so severe that its sale was so considerable, as to enable Middleton to purchase a small estate at Hillesham, six miles from Cambridge, where he chiefly resided during the remainder of his life. Middleton's 'Life of Cicero' is written, like all his other works, in a pleasing and perspicuous style, and the strong bias of the author in favour of his hero has fre-
quently led him to become the panegyrist of very question-
able actions, and even to misrepresent, perhaps not inten-
tionally, events which disfigure the character of his favourite. [Cicero, p. 156.] Dr. Park, in a preface to a republication of Bellendens, entitled 'De Statu,' asserts that Middleton, in his 'Life of Cicero,' bor-
rowed very largely from a work of Bellendens on the same subject, and by making the facts of the history of Roman literature agree with the character of Cicero, which is entitled 'De Tribus Luminibus Romanorum.'

Two years afterwards, Middleton published a translation of Cicero's letters to Brutus, and of Brutus to Cicero, with the Latin text, and a prefatory dissertation, in which he de-
fended the authenticity of the epistles against the objections of Tunstall, who maintained that they were the composition of some sophist. The arguments of Middleton were com-
bat ed by Markland in his Remarks on the Epistles of Cicero to Brutus, and of Brutus to Cicero, in a letter to a friend.' [MARKLAND.]

In 1745 he published 'Germana quaedam Antiquitatum eruditi Monumenta,' &c., in which he gave an account of the various specimens of ancient art which he had collected during his journeys in Germany. In two years, he pub-
lished his 'Treatise on the Roman Senate,' in which he maintained that all vacancies in the senate were filled by the people; and in the same year he published 'An Introductory Discourse to a larger work, designed hereafter to follow.' It is a work calculated to make the reader believe that the clergy are supposed to have subsisted in the Christian Church from the earliest ages, which was followed in 1749 by 'A Free Inquiry into the Miraculous Powers,' &c. This work was afterwards followed by another, addressed to Dr. Waterland; it was attacked by Dodwell, Church, and others, and was generally condemned by the clergy as tending to de-
stroy the authority of miracles in general. Middleton how-
ever disclaimed all such intention; and it must be allowed, that whatever may have been his private opinions, he does
not in this work advance anything which could fairly be construed into an intention of revelation; perhaps the general controversy had made him more cautious. The object of the 'Free Inquiry' was to place the divines of his own church in the awkward predicament of either denying the authority of the fathers altogether, or else of admitting that a part of the leading doctrines of the Roman Catholic Church, which he maintains to be satisfactorily established by the testimony and miracles of the early fathers. Edward Gibbon, who was then a young man at Oxford, chose the latter alternative, and went over to the Roman Catholic Church rather than abandon the authority of the fathers. [Gibbon.]

In 1750 Middleton published 'An Examination of the Bishop of London's (Dr. Sherlock) Discourses concerning the Use and Intent of Prophecy,' in which he maintained that the use of prophecy in the days of Christ and his Apostles, was drawn entirely from single and separate predictions, gathered by them from the books of the law and the prophets, and applied, independently of each other to establish the Messiahship of Jesus, and that there was no foundation for Dr. Sherlock's argument that the prophecies of each age were intimately connected with each other and with those of the preceding age, and that the whole formed one connected series from the time of Moses. In 1753, and again in 1756, he was summoned before the House of Commons, and on the second occasion he was also summoned before the House of Lords. In 1758, he died at Hildersham on the 28th of July, 1750. He accepted, shortly before his death, a small living from Sir John Frederick. His subscription to the thirty-nine articles and the canons of the church on that occasion was signed and sealed, but he did not build or destroy any church. Several of his works included in this collection which had not been published before, of which the most important are: 'A Preface to an Intended Answer to all the Objections made against the Free Inquiry;' 'Some curious Records of his works have been preserved, which he wrote at Antioch between Peter and Paul;' 'Reflections on the Variations or Inconsistencies which are found among the Four Evangelists;' 'An Essay on the Gift of Tongues;' 'Some Short Remarks on a Story told by the Antients concerning St. John the Evangelist and Commodus the Emperor;' and 'An Essay on the Allegorical and Literal Interpretation of the Fall of Man.'

MIDDLETON, THOMAS PANTAW, D.D., the first English bishop of Calcutta, was the only son of the Rev. Thomas Pantaw, of Rolleston, in Derbyshire, and was born at that village on the 26th of January, 1769. In 1779 he was admitted into Christ's Hospital, London, and from thence he proceeded to Pembroke Hall, Cambridge, which became the subject of his death on the 29th of March, 1792. In the following March he received ordination, and entered upon the curacy of Gainsborough, in Lincolnshire. Here he edited a periodical work, entitled 'The Country Spectator,' which continued to appear for about seven months, and most of the papers in which were written by Mr. Middleton himself. In 1794 he became tutor to the two sons of Dr. John Pretzman, archdeacon of Lincoln, and brother of the bishop. In consequence of this appointment he removed, first to Lincoln, and then to Grantham, where he became curate of St. Peter's Mancomb in 1799, having already, in 1795, been presented by Dr. Pretzman to the rectory of Tansor, in Northamptonshire. In 1797 he married Elizabeth, the eldest daughter of John Mancomb, Esq., of Grantham. This happy event not only brought him a great increase of domestic happiness, but also assisted him in his literary labours, by transcribing all his manuscripts for the press. In 1802 Dr. Pretzman presented him to the rectory of Bytham, in Lincolnshire. About this time he wrote 'A Short Essay on the New Testament of the Greek Article, applied to the criticism and illustration of the New Testament,' which he published in 1808, with a dedication to Dr. Pretzman. In the same year he took his degree of D.D. at Cambridge, and removed to his brothers, with whom he discharged his duties in such a manner as to gain the affection and esteem of his people. In 1809 he was appointed by Bishop Pretzman to a stall in the cathedral of Lincoln, and in 1812 to the archdeaconry of Huntington. In 1811 he resigned his two livings for the vicarage of St. Pancras, Westminster, and the rectory of Rotlimin, in Hertfordshire. He fixed his residence at St. Panonas, and made the acquaintance of several dignitaries of the church and other distinguished individuals.

About this time a provision was inserted in the Act for the renewal of the East India Company's Charter, enabling the crown to constitute a bishopric in India. Calcutta was made a see in 1813, and Dr. Middleton was appointed the first bishop, and consecrated by the archbishop of Canterbury on the 6th of May, 1814. After receiving an address from the Society for the Promotion of Christian Knowledge, of which he was a warm supporter, requesting aid in promoting the objects of his See in a country generous, and after being elected a fellow of the Royal Society, Bishop Middleton sailed on the 8th of June, and arrived in Calcutta on the 28th of November, after a voyage which he had diligently employed in increasing his qualifications for his See, specially as a missionary and an ecclesiastical character. A bishop of Calcutta he made every effort to promote the interests of Christianity according to the tenets of the Church of England, and to aid the cause of education. He made three variations of his immense diocese, in two of which he directed his particular attention to the state of the Syrian Christians in the neighbourhood of Cochin, on the coast of Malabar. By his efforts the Bishop's College at Calcutta was established for the education of clergymen and missionaries. The address of the clergy and the people of Bengal, to the legislature, on the 17th of December, 1820. He instituted a consistory court at Calcutta, and would have done the same at Madras, but for the opinion of the advocate-general at Madras that such a measure would conflict with existing arrangements.

Bishop Middleton died of a fever on the 8th of July, 1822, in the fifty-fourth year of his age. He was buried at Calcutta, and the greatest respect was shown to his memory. He was the first bishop's stall, and none of his successors have been able to build or destroy any church. He laid the first stone of its buildings on the 15th of December, 1820. He instituted a consistory court at Calcutta, and would have done the same at Madras, but for the opinion of the advocate-general at Madras that such a measure would conflict with existing arrangements.

The object of Bishop Middleton's work on the Greek article is, first, to establish the rules which govern the use of the article, and then to apply these rules to the interpretation of the New Testament. Many of which are of such a nature that they furnish admirable or against the divinity of Christ, according to the different views which are taken of the force of the article. Owing to this circumstance the doctrine of the Greek article has been discussed with great acuteness, and some Unitarian divines have strongly opposed the views of Middleton. His chief rules have however been received as sound by the great majority of biblical critics. A second and improved edition of Middleton's work was edited by Professor Schoefeld in 1826, and a third edition by the Rev. Hugh James Rose, 1833. An abstract of the work is prefixed to Valpy's edition of the Greek Testament.

MIDDLING. [BIBLICAL.] MIDHRAVEN ( MIDIHRAYNE, MIDHRAVAH, MIDHRAVIH), the descendent of Midian, the son of Abraham by Keturah (Gen., xxv, 2, 4), who, with the other sons of Abraham's concubines, migrated eastward from Canaan during Abraham's life (Gen. xxv, 6). In the time of Jacob their merchants had caravans from Gilead through Palestine to Egypt (Gen., xxxvii, 28, 36). In the time of Moses we find them in Arabia Petraea, under the government of a high-priest (Exod., ii. 15), and leading their flocks as far as Mount Sinai (Exod., iii. 1); but they did not extend to the west of the mountain, for they deserted their flocks with them in their march from Egypt, but, on the contrary, Jethro, their high-priest, came out of his country to visit Moses, when the Israelites were encamped at the foot of Sinai (Exod., xvii. 1-5; Num., x. 26). They are next mentioned as living in the neighbourhood of the plains of Moab, to the east of the Dead Sea and the river Jordan,
where they suffered a defeat from the Edomites (Gen., xxxvi. 33), and where they again appear as allies of the Moabites when the Israelites arrived in the second time on the borders of Palestine (Numb., xixii. 4). Here they cor-
rupted the Israelites with the licentious worship of their god Baal-peor, and were punished by a dreadful massacre (Numb., xxx., xxi.; Josh., xiii. 21). This calamity however fell only on the Moabites of the nation, for afterwards, with the Amalekites and other eastern tribes, invaded the coun-
try of the Israelites, and destroyed the harvests, during seven successive years (Judges, vii. 1-3, 33). At last Gideon (Judges, vii. 11) defeated the Midianites and Amalekites in their greatest strength and pursued them as far as the Jordan (Judges, viii. 33; viii. vii.). In the time of Isaiah, the Mi-
dianites were still known as a commercial tribe (Is., ix. 6), but their name afterwards merged in that of the Arabs.

The exact country of the Midianites is not determined with certainty. Some indeed suppose that those in Arabia Petraea, mentioned in Exodus, ii. 15, were quite a different nation from those on the east of Palestine, the former being related to the descendants of Cush (Numb., xii. 11; Hab. iii. 7). But the more common and more probable opinion is, that the Midianites were an Arabian nomadic tribe, whose possession extended from Mount Sinai and the head of the Red Sea up to the plains of Moab, while there may have been other bodies of them in the western part of Ara-
bis. The Arabian geographers Abulfeda and Edrisi mention a town, Madian, on the eastern side of the Atlantic gulf of the Red Sea, somewhat to the north of the modern Mohaia, which is probably the Mabasa of Ptolemy (v. 17) and the Malach of Josephus (Ant., xii. 11). Of the rain-water basins which were seen to be in the time of Eusebius and Jerome. The Midianites were governed by their elders (Numb., xxxii. 4), and by chiefs or kings (Numb., xxviii. 15; xxxii. 8; Judges, viii. 25; viii. 3). When they invaded Palestine they were in a formidable state; they possessed many camels, and had acquired great wealth, probably by commerce (Judges, vi. 5; vii. 12; viii. 10, 24; Is., ix. 6). Their reli-
igion was the worship of Baal-peor. (Baal.)

The Midianites were also mentioned in Judges, xxxvi. 28; Judges, viii. 24), which is a proof of their close connection with the Arabs. (Rolandi, Palestina, 98; Winer's Bi-
Bische Realrerterbuch.)

MIDSHIPMEN are young gentlemen ranking as the highest of the first class of petty officers on board a ship of war: their duty is to pass to the seamen the orders of the captain or other superior officer, and to superintend the performance of the duties so commanded. They are edu-
cated for their profession at the Royal Naval College, and are required to remain two years on board before they can be rated. Such as are appointed by the special authority of the Lords Commissioners of the Admiralty are denomi-
nated Admiralty midshipmen.

The regulations of 1833, the whole number allowed to be embarked on a ship of war varies according to the rate of the latter; a six-rate ship may have eight, and a first-rate may have twenty-four midshipmen. And, on a ship being put in commission, the captain or commander may select them from the Royal Naval College, subject however to the approbation of the lords of the admiralty.

Should there be more Admiralty or College midshipmen than can be provided for, their lordships may give appoint-
ments, as extra-midshipmen, to two at most for any one ship, to increase the place of the seamen, and they are included in the complement of mid-
shipmen when vacancies occur.

The monthly pay of an officer of this class is £15. 5s. for ships of all rates.

MIDSUMMER EVE. On the eve of the feast of the Nativity of St. John the Baptist, or Midsummer-day, it was long the custom to kindle fires at midnight, sometimes upon the hills, in honour of the summer solstice; a practice which continued long after the introduction of Allegoric Oracles. That 10 May was considered among the ancient nations. In later times these were sometimes called St. John's fires; and they are still lighted in Ireland. The 'Times' newspaper of June 29, 1-23, contains an account of a riot at Cork in consequence of a Midsummer Eve custom of turning towards the fires which were to be lighted on St. John's Eve.

(Miller's Popul. Antiq., 4to. ed., vol. i, p. 338; Miller's Inquiry into certain Vulgar Opinions concerning the Catholic Inhabitants and the Antiquities of Ireland, 8vo.,

Lond., 1808, p. 100; Vallancey, Collect. de Rebus Hibernios,

No. 1, p. 123.)

MIEI, JACOBI GIOVANNI DELLO VITE, one of the most eminent of the Flemish artists, was born in 1599. He studied under Gerard Segers, in whose school having highly distinguished himself, he went to Rome, where he especially studied and copied the works of the Caracci and Correggio. On his return to Flanders with the intention of living at Maastricht, he declined the friendly proposal of Sacchi, and resolved to adopt the style of Bamboccio, to whom he was now inferior in force or brilliancy. His favourite subjects were holiday parties, carousals, gipsies, beggars, and pastoral scenes and persons. We speak of his easel pictures, with the finest performances; but he likewise painted historical pic-
tures on a large scale, both in fresco and oil, which, though wanting in elevation of design and grace in the heads, are far superior to what might be expected from an artist whose subjects were in general of so much lower a class. His pic-
tures of hunting-parties are particularly admired: the figures and animals of all kinds are designed with extraor-
dinary spirit and truth to nature; the colouring is beautifully composed, and the expression of the countenance withal poetic and delicate. His great merit procured him the favour of Charles Emanuel, duke of Savoy, who appointed him his principal painter, conferred on him the order of St. Maur-
utius, and presented him with a cross set with diamonds of very great value. In the manner of painting his portraits are many examples in the imperial gallery at Vienna; and in a grand salon in the hunting seat at Turin there is a series of his noblest productions, representing the chase of various kinds of animals.

MIEIRIS, FRANCIS (called the Elder), was born at Leyden in 1633. This admirable artist was at first placed under the care of Abraham Toorne Vliect, one of the best designers in the Low Countries; and after having made considerable progress, under the discipline of Gerard Douw. He soon so far surpassed all his fellow-stud-
ents, that Gerard Douw called him the prince of his disci-
plines. He excelled Douw in elegance, in correctness and brilliancy of colouring, and in the art of painting silk, velvet, satin, and other rich stuffs, and was nearly equal to him in finish. His works are rarely to be seen, and more rarely to be sold, and their prices are very high. Besides portraits, he painted conversations, persons performing on musical instruments, patients attended by their physician, &c. But his own especial taste was for pictures calculated according to the time he spent upon them, at the rate of a durst an hour. His finest portrait is that of the wife of M. Cornelius Plaet, in whose family it was carefully preserved, according to Pilkington, though very large sums had been offered for it. Some of his portraits are in the Florence Gallery. He died in 1681, aged forty-six.

MIEIRIS, WILLIAM (called the Younger), the son and disciple of Francis, was born at Leyden in 1662. He had made considerable progress during the life of his father; but having lost him when only nineteen years of age, he devoted himself to the study of nature. His first subjects were taken from private life, like those of his father, in which every part was copied minutely after nature.

After a period of unusual production, he attempted, on his first performance of this kind was Rinaldo asleep on the lap of Armida, surrounded by the Loves and Graces, which was so highly admired, that he was prevailed upon to paint three repetitions of the same subject. He likewise painted the Bacchus and Ariadne; and was nearly equal to his father in elegance, composition, and delicacy, in clay, that he might be ranked among the most eminent sculptors. He was inferior to his father in design, group-
ing, and effect; nor has he been the same exquisite touch. His death occurred about 1727, and almost at the same time as that of his father, for he died in 1747, at the age of eighty-five, equally esteemed as a man and an artist. The above account is taken from Pilkington and others; but Dr. Warton is much less favourable in his opinion: he says, 'The degeneracy of Dutch painting, expressed by the decline and almost entire re-nunciation of the Roman style, is manifest in all its dulness and numbers, in this master, most of whose works are extremely disagreeable to me.'

MIEIRIS, FRANCIS (called the Younger Francis), was the son of William, but much more than him. He made
numerous copies of the works of his father and grandfather, and it is probable that such copies are put off at public sales as their performances. He is more distinguished as an historian, by his 'Historie der Nederlandsche Vorsten,' 3 vols. fol., the Hague, 1732-3; and 'Groot Charterboek der Grave van Holland, Zeeland, en Vriesland,' 4 vols. Leiden, 1737. The native town Leyden was left unfinished, one volume only having been published. He died in 1763, aged seventy-six.

MIGNARD, PETER (called the Roman), was born at Turin, 1651, and was the pupil of More; but his father, who was of English origin, took the name of Mignard. He was at first intended for the medical profession; but as he manifested a decided talent for painting, his father placed him in the school of Jean Bouchier, at Bourges, and subsequently built out the Royal Academy of Fine Arts. At the age of twenty he travelled through some capital paintings of the Italian masters, he left Vouet and went to Rome, in 1636, to study after Raphael, Michael Angelo, and A. Caracci. He spent twenty-two years at Rome, during which time he painted many historical pictures and portraits, among which those of popes Urban VIII. and Alexander VII. were the finest. In 1659 he was invited to Paris at the suggestion of Colbert, and, on his way through Italy, had the honour of painting the portraits of several of the Italian princes and their families. He died at Rome, 1674, after having painted in the Louvre for his portrait ten times, and gave him a patent of nobility; and after the death of Le Brun, appointed him principal painter, director of the Royal collections of the Académie des Beaux Arts, and of the Orphan girls. Mignard executed one of the greatest works in fresco in France, the cupola of Val de Grace. He also adorned the great hall at St. Cloud with mythological subjects, undertook several works at Versailles, and painted numerous portraits. Two studies which is seen every day, he studied at Rome, in invention, elevation, depth of feeling, and originality, his pictures, especially his Madonnas, have much delicacy and grace; his compositions are rich; his colouring, in general, is brilliant and harmonious; and he understands, as well as his hundred predecessors, the bearing and grace of the French school. He died in 1695, at the age of eighty-five. Nicholas Mignard, Peter's brother, two years older, was a very respectable artist; he studied two years at Rome with Peter. He died at Paris in 1686, where he was de
corated at the Academy of Painting.

MIGUEL SANCHEZ. [MEXICAN STATIST.]

MIHEL ST. [MUSEUM.]

MILA'NO, THE PROVINCE OF, is bounded on the north by the Marches of Milan, on the east by the Po, on the west by the Ticino, which separates it from the Sardinian territory. The province of Milan is entirely in the great plain of Lombardy, and is divided into the following districts: Milan, Bellate, Saronno, Barbassina, Verano, Vincenzo, Gorgonzola, Gallarate, Cuggiono, Busto Arsizio, Sonza, Melzo, Melegnano. The only town, besides Milan, is Monza, ten miles north-east of Milan, with about 12,000 inhabitants, and a fine old cathedral founded by the Longobard queen Theodolinda: it contains several good paintings, and the portraits of all the sovereigns who have worn the iron crown of Lombardy, from Agilulphus, the husband of Theodolinda, to Charles V. The iron crown, so called, is kept in the province of Como, which is divided into five districts: Milan, Bellate, Saronno, Barbassina, Verano, Vincenzo, Gorgonzola, Gallarate, Cuggiono, Busto Arsizio, Sonza, Melzo, Melegnano. The only town, besides Milan, is Monza, ten miles north-east of Milan, with about 12,000 inhabitants, and a fine old cathedral founded by the Longobard queen Theodolinda: it contains several good paintings, and the portraits of all the sovereigns who have worn the iron crown of Lombardy, from Agilulphus, the husband of Theodolinda, to Charles V. The iron crown, so called, is kept in the cathedral of Monza. The archives contain many old documents, and some fine MSS. of the time of Pope Gregory the Great, and is surrounded by a vast park and gardens. The neighbourhood of Milan contains many other fine country residences belonging to the Milanese nobility and landed gentry; among others Osate, Leinato, Castellazzo, Gornetto, Villa Trivulzio near Desio, and Montebello. This last is memorable from having been the head-quarters of Bonaparte after the campaign of 1799, and during the negotiations which preceded the peace of Campo Formio. It was at Montebello that he decreed the destruction of the Austrian archives. The roads in the province of Milan are numerous, wide, and kept in excellent repair.

MILANO, the capital of Lombardy, and the third city of Italy, being the residence of the archbishop of Rome in population and importance, stands on the sides of a vast plain, between the rivers Olona and Lambro, with which it communicates by a canal called Naviglio Grande, which flows all round the original old town, of which it marks the boundary. The general called Naviglio di Martesana put Milan in communication with the Lake Maggiore and the Lake of Como on one side, and with the Po on the other. The suburbs, which have been gradually built out beyond the boundary, and which occupy more space than the original city, are enclosed by a line of ramparts, which is planted with trees, and serves as a promenade. This external circuit of the town is nearly ten miles. Much of the space however between the Euguglio and the ramparts is not built upon, and is occupied by gardens and fields. The population of Milan, in 1837, was 145,387. (Bollettino Statistico.) In 1770, when the abbe Richard wrote his tour, it did not amount to 100,000. In 1816, under Napoleon, it was 130,000. In 1837, 120,000. Thus it has increased since which time it has been increasing yearly. The widest and finest streets of Milan are in the external part of the town, or suburbs: those which lead to the principal gates of the town being the most fashionable promenades. The Corso di Porta Orientale, which leads to the Castle, is the most frequented. The streets of the old town are mostly narrow and irregular. The duomo, or cathedral, stands nearly in the centre of the town, and its lofty spire, is crossed every day by at least ten thousand persons, serves as a directing point to strangers. This magnificent building, all of white stone, and dedicated to the Virgin Mary, was begun by Giovanni Galeazzo Visconti, duke of Milan, in March, 1386, and is not yet quite finished. The exterior, with its three storeys, is of various sizes, looks like a forest of marble. The style of architecture is a kind of florid or modern Gothic; the front is of a mixed style. The interior is vast and imposing, and not loaded with ornaments. There are 320 steps to ascend, in order to reach a gallery which runs round the principal spire, from which there is a most splendid view of the whole Lombard plain, and of the chain of Alps which borders it in the form of a crescent on the north side. The works of art with fine statues and marble tombs of Lords Supper, by Leonardo da Vinci, in the refectory of the former convent of Santa Maria delle Grazie, though badly injured, is not yet quite obliterated.

Milan is a gay, thriving, modern city: its markets are splendidly supplied in every luxury, and the citizens are generally fond of good living. Numerous coffee-houses, splendid hotels, abundance of handsome carriages, elegantly dressed pedes

M I L

208

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Milan abounds with charitable institutions. The great hospital, one of the finest and largest in the world, has been richly endowed by numerous benefactors, among the latter by those portrait paintings which are scattered all over the house. A singular but harmless distinction has been observed in these portraits. Those benefactors who have contributed below a certain sum are represented standing, whilst those whose donations or legacies have exceeded this limit are seated, and among them confounded alike in their case. Four houses of refuge for poor children are supported by public contributions. Two large workhouses for the unemployed poor have been established late years, as well as a house of correction for criminals, who are employed in various laborious works within the city walls. A library and museum are in an excellent state of repair, and more recently a magnificent library of the University is built. The city also contains a university, a conservatory or school of music, and a school of the fine arts. For general education, there are two royal colleges or Lyceum, three gymnasias, a clerical seminary, and three colleges or houses for female education.

The elementary schools are noticed in the article LOMBARD-VENETIAN KINGDOM. The Society of Arts and Sciences bestows annual prizes for inventions relating to agriculture and manufactures.

The manufactures of Milan are of some importance; there are those of silk, printed cottons, plate-glass, jewellery, artificial flowers, braid, soap, and leather.

Milan is an archbishop's see, the residence of the Austrian vicerey and of the governor-general of the Lombard province, and is the seat of a court of op- position for civil and another for criminal matters, and a commercial tribunal, called 'Tribunale mercantile e di Cambio.'

The public gardens, the ramparts, the great parade, which occupies the site of the old citadel, and the several avenues planted with trees which lead from the gates in various directions, afford pleasant walks and rides. The climate of Milan is hot in summer, but occasionally cold and foggy in winter; it is however considered healthy.

The theatre of the Grand Duke of Tuscany was built in the time of the French dominion, for the exhibition of chariot and horse races, bull-fights, and other games, is of an oval form. The arena, which is about 800 feet in length, can be filled with water, and be transformed into a naumachia for boating.

The Duomo and La Scala theatre have so completely absorbed the attention of travellers, that few of them have done more than barely mention any of the other edifices, nay, those of even the town of Milan contain little or nothing on examination of account on their architecture. Even Woods, in his 'Letters of an Architect,' speaks only of some of the older churches, scarcely naming any one building besides, or any work of the last or present century, the theatre of La Scala and the Duomo of the Marchesi, and the Church of Santa Maria presso San Celso, the work of Galleazzo Alemo, nor the more refined elegance which stamps many of the buildings of the modern architects, has been described.

The Duomo, not one of these edifices, not even the gorgeously-picturesque façade of Santa Maria presso San Celso, the work of Galleazzo Alemo, nor the more refined elegance which stamps many of the buildings of the modern architects, has been described by the pencil of any of our English artists, who seem to have visited Milan for no other purpose than that of delineating what is so familiar to the eyes of our own citizens.

The Arco della Pace calls for more particular notice, as being one of the most splendid public embellishments of Milan, and, after the Arc de l'Etoile at Paris, the most important monument of the kind erected in modern times; as well as being the principal work of its architect, the Marchese Luigi Cagnola, by whom it was commenced in 1807, and carried on until his death, August 10, 1833, after which it was continued by Carlo Lodiondo, and finally completed in 1837. It stands on the north-west side of the city, midway between the Duomo and the Piazza del Duomo, and between the Duomo and the other, or that towards the city, is viewed between two elegant Doric marble buildings (servile as guard and toll houses), which are placed a little in advance of it, and are about three times the breadth of its front apart. The arch, which is entirely faced with marble, and highly enriched in every part with reliefs and sculptures, besides statues both upon and in front of the arch, forms an architectural mass whose general dimensions are 72½ feet English, by 42½ in depth, and 74 in height, when the setting-out and steps, which at the extreme height is 98 feet. Each of the principal fronts exhibits four fluted Corinthian columns, with half-columns behind them, and between them a centre arch (24 feet wide and 48 high) and a smaller one (10 feet 9 inches wide and 52 high) on each side of it. The frieze of which is enriched throughout with figures of genii holding festoons is not made to break over each of the columns, as in the triumphal arches of antiquity, neither is it continued round the whole of the exterior, so that the Park, London, but it forms only a single projecting break on each side of the centre, whereby the inconvenience is avoided of such a mass of stone being suspended over the wider centre intercolumn. This disposition of the entablement is as good as can be excepted. The centre of a statue being placed over each column, a single recumbent one, or of larger dimensions than would else be suitable, is placed on these projecting entablatures. Those on the sides towards the city represent the rivers Ticino and Po, on the other the Adige and Tagliamento, the two forms of which were executed by Caccietori, and the latter by Pompeo Marchesi.

There is some peculiarity in the plan of the Arco della Pace. There being no transverse passage through the arch from end to end, as in the Arc de l'Etoile, but merely an opening through the piers separating the larger arch from the one on each side of it, owing to which the external sides or ends of the structure have the expression of greater solidity. At each angle of the attic is a bronze equestrian statue of a warrior about thirteen feet high; and on the side towards the city the centre is crowned by a colossal figure of Peace (mo- mabled by Sangiorgio, and cast in bronze by Luigi and Tommaso Marchesi), which is one of the richest architectural displays of the age. This description, however, is not exhaustive of the various other sculptures and reliefs that so worthily adorn this magnificent work.

Milan, under the name of Mediolanum, was a town of the ancient Romans, founded by Lucius (s. 24) and Polybius (b. xi). It was taken by the consul M. Marcellus and C. Cornelius Scipio, b. c. 221. It is said in history of Milan afterwards until the third century of our era, when Maximian, the emperor of Diocletian, fixed his residence at Mediolanum, having walls,
which were two miles in circumference, and when continued to enclose the area of the town till the time of Frederic I., in the twelfth century. Valentinian II., Theodosius I., Honorius, and other emperors of the fourth and fifth centuries, resided occasionally at Milan. At the fall of the Western empire, Milan was twice devastated, once by Attila, and afterwards by the Goths under Vitiges, A.D. 539, and it did not recover from its ravages for several centuries. It was burnt by the Saracens in 879, and again by the Lombards in 962.

It remained in obscurity till the latter part of the ninth century, when, under the reign of the emperor Charles the Fat, the archbishop, Ansperatus restored the walls but for the sake of retaining the freedom of the inhabitants. From that time Milan recovered, and grew in population and wealth, and became gradually the principal city of Lombardy. The remainder of its history is given under LABIARDI and LOMBARD CITIES. The present city of Milan has no claims to classical antiquity, the only solitary remains of Roman construction being sixteen handsome fluted pillars near the church of S. Lorenzo, which are supposed to have formed part of a temple dedicated to Hereules by Maximian.

The history of Milan has been written by Corio, Ripamonti, Calco, Giuliani, and lastly by Verri, who is the most critical and enlightened of the native historians, 'Storia di Milano,' with a continuation by Custodi; 4 vols. 1815-1822. A town infested with pests may be easily turned into one free from the same by a few agents. Crotona Scriptore Medicinosus,' 4 vols. fol., 1745. Pirrovan has published a description of Milan, 'Nuova Guida di Milano, i suoi Stabilimenti di Scienze, di Pubbliche Amministrazioni,' &c., 1824. Numerous other authors have written upon particular buildings and other subjects relative to this important city. See also the Plan of Milan, published by the 'Society for the Diffusion of Useful Knowledge.'

MILK is a disease which attacks both living and dead vegetable matter, and is believed by the vulgar to be owing to fogs, dew, meteor, and noxious exhalations, but in reality is caused by the ravages of parasitical fungi. This malady is often of little importance to the subjects of its attack, but is most fatal to the functions of plants, which most essential of the vital functions of plants are fulfilled, or in such a small degree as to produce no appreciable effect upon the general health of the plants infested. But it very often becomes a most serious evil, destroying the straw of corn, and so preventing the maturation of the grain, ravaging the fields of peas and beans, destroying the hopes of the gardener by seizing upon his peaches and nectarines, especially when forced, and not infrequently extending its evil influence to the orchards and every description of kind of fruit. The species of fungi which produce these effects are always very minute, and often of microscopic smallness. Some are intestinal, attacking plants internally, and only becoming visible, at which stage it is too late, for the plant the purpose of shedding their spores; others are superficial, rooting and fracturing upon the outside of the epidermis. These two classes of mildew fungi require to be carefully distinguished.

Of the internal fungi the following are the more common, viz:—

1. Uredo fasicola, called the Pepper-brand. This plant attack's wheat, filling the young seed with its jelly-like spawn, and producing myriads of fasicol deep brown spores, which by means of interstitial tubes offend the crops of cereal and cudive, spreading on the field and producing the appearance of scorching.

2. Eriume griseum, and other species of the same genus, which overrun the leaves of the mountain ash, the sycamore, &c., forming broad grey, orange, or brown blotted spots upon them.

3. Various kinds of Puccinia. The mildew of wheat-straw is caused by Puccinia graminum, which is generated in cavities below the epidermis of the stem, and protrudes when ripe in the form of dull greyish-brown striae. Puccinia is next in the series of mildews. It consists of four spores of velery and cudive, spreading on the field and producing the appearance of scorching.

4. Acridium cancellatum occasionally does much harm to pear-trees in the orchards of Herefordshire. It appears at first as spots, but in the young the spores soon appear. Another species, Acridium lacteratum, sometimes spreads over hawthorn hedges; and the common orange-red mildew of the Berberis is Acridium Berberidis.

5. Scerotium, a hard kernel-like fungus, is a less common but somewhat troublesome visitor. Scerotium occasionally establishes itself in the kind of fruits, rendering them uneatable; S. Cyparisii and others attack the leaves of various plants, particularly of the pear-tree.

In all these cases it is usually found that the most vigorous individual of the plant is the first affected, generally in the case of Uredo and Puccinia; and it is probable that the spores from which these plants are propagated are drawn into the circulation from the soil, along with the fluid matter upon which plants feed; that they are carried along into the stem, and begin to grow as soon as they find themselves in a suitable situation, disturbing and disorganising the tissue by the production of their spores, and taking to themselves that nutrient which would otherwise have been applied to the general maintenance of the plant attacked. Mr. Bauer found that he could always cause wheat to produce the Uredo fasicola by rubbing its grains with the spores of that fungus previous to their being sown; and Mr. Knight ascertained that by sowing pear-seeds in a loamy soil, which the young leaves of the seedling plants were attacked.

Of superficial fungi the following are the more remarkable:

1. Cylindrosporum concentricum, a peculiar species, which appears in dots arranged in a circular manner upon the leaves of the cabbage.

2. Ascosporum monilioides.—A frequent cause of the whitened of leaves and stems in roses, &c. It consists of very multitudes of thread-like filaments, which bear spores. These form the white mealy appearance of the leaves of onions and similar soft-leaved plants.

3. Botrytis diffusa and species of the genus Aspergillus, whose filaments bear tufts or branches, covered with spores. These form the mildew of peaches. It consists of white cobweb-like spawn, radiating from a solid grey spherical centre, filled with the spores of the species. Peach mildew is often caused by another of this genus, the E. panax.

The attacks of superficial fungi are generally brought on by the debility of the species attacked; and it is probable that unhealthy individuals only are suited to the growth of these parasites. This is like what occurs among animals, which, when healthy, are rarely seen by the pests of the vegetable kingdom, but as soon as they become sickly are over-run by them. Heavy rains occurring suddenly after long drought are mentioned as the cause of this kind of mildew; and it may be supposed that the plants are debilitating by the dry heat of the sun, which dries up the moisture of the soil, as soon as rain falls they grow with rapidity and quickly overrun the plants. It is said that deep-coloured roses and peaches are more liable to mildew than others; this may be referred to constitutional debility, for their colour is connected with a want of power to decompose carbonic acid, which is one of the most indispensable of vital functions in the vegetable kingdom. Transplanted onions, which are less vigorous than untransplanted ones, are the most subject to mildew.

These causes of mildew being rightly understood, the methods of preventing the evil are sufficiently obvious. To cure intestinal mildew the soil should be neither too rich nor too freely watered, and every precaution should be taken to prevent the spores of the disease from being comminuated in the soil. Mr. Knight stopped the attacks of Acridium cancellatum by taking up his mildewed pear-trees, washing their roots clean, pruning them closely, and removing them to a new situation; those removed became healthy, but as soon as they were again planted the mildew appeared to have become insensible of destroying the mildew. Mr. Baer says that if corn attacked by pepper-brand is soaked in lime-water for at least 12 hours and then well dried in the sun, it will not afterwards be attacked, but the plants themselves are insensible of nourishing the fungus; at least he found that prepared grains could not be inoculated, although unprepared grains could be. With
regard to destroying superficial mildew, a restoratation of vigour or its preservation seems to offer the best chances of success. Mr. Knight prevented his peas from mildewing by watering them abundantly and constantly; in Scotland, where the climate is more equable than in England, and the nights are more abundant, pea mildew is unknown; the writer of this has seen a crop of onions, perishing under the attacks of Botrytis  diffusa, gradually restored to health by a constant supply of water. As to the schemes of stopping superficial mildew by the application of sulphur, quick-lime, free lime, and lime and equal parts of water, although of similar mildew, it does not appear that any advantage follows their employment. When trees are attacked by superficial parasites, the best plan of removing the evil is by cutting off all unhealthy branches and tying them, together with shreds, nails, or whatever else may have been made use of in training the plants. Mr. Hayward recommends in addition that peach-trees, which are very liable to mildew, should be subsequently washed with a fluid consisting of 4 gallons of rain-water, 2 lbs. of soft soap, 1 lb. of flower of sulphur, 1 lb. roll tobacco, 1 quart of fresh-squeezed lime, and 1 pint of spirits of turpentine, the whole boiled together for half an hour.

MILE. This word is derived from milites, the milite, the members of the Roman army. Each pace was five feet, and each foot certainly contained between 11.60 and 11.64 modern English inches. [STANDARDS OF LENGTH.] Taking the Roman foot at 11.62 English inches, the original Roman mile was therefore 1614 yards, or 1468 Roman feet, of the English statute mile, that is, nearly sixtieth of an English statute mile, very nearly; while the English mile is a Roman mile and nine hundredths of a Roman mile. The English statute mile is 8 furlongs, each of 220 yards, or 10 poles of 5 yards each, 1609.34 yards, or 1460.765 feet, the last being the even number of feet, approximately, that is usually expressed. It is therefore 1760 yards, or 5280 feet. The square mile is 640 square chains, or 640 acres.

The remains of the Roman mile and the Gallie or Celtic league [as here found in the itinerary measure of most European countries. The following list (taken from Kelly's 'Cambist,' except the statement of the Roman mile) will show the itineraries of various countries, as they are usually reputed in English yards and statute miles: Yards, or feet, in round numbers, of miles, as shown by the last column shows in round numbers how many of each make 1000 statute miles:—

<table>
<thead>
<tr>
<th>Mile</th>
<th>Yard(s)</th>
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<tbody>
<tr>
<td>Antient Roman mile</td>
<td>1917</td>
</tr>
<tr>
<td>Modern Roman mile</td>
<td>925</td>
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<tr>
<td>English statute mile</td>
<td>1000</td>
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<tr>
<td>1614</td>
<td>1000</td>
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<td>1628</td>
<td>927</td>
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<td>1760</td>
<td>927</td>
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<td>1844</td>
<td>127</td>
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<td>127</td>
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<td>2463</td>
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<td>2653</td>
<td>242</td>
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<td>2960</td>
<td>242</td>
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<tr>
<td>Portuguese league</td>
<td>3841</td>
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<td>German short mile</td>
<td>3897</td>
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<td>English league</td>
<td>3900</td>
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<tr>
<td>Spanish common league</td>
<td>4214</td>
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<tr>
<td>English statute mile</td>
<td>4214</td>
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<tr>
<td>English league of 25 to the degree</td>
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<td>761</td>
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The metrical mile of 1000 French metres, or one kilometre, or 1909.5 yards, is still known among the French, Italians, and the Netherlands; the geographical mile, or the sixtieth of a degree of latitude, is used in England and Italy; the geographical mile of three such miles, or 6075 yards, is used in India and Japan; and the German geographical mile is for English geographical miles, or 8000 yards; the short mile used in Poland (which is also the league of Brabant) is the English league (5076 yds.), and the long mile of the same country is the German geographical mile (8101 yd.), which is also the length of the mile in Holland. The Arabian mile is 2149 yards; the Chinese is 678 yards; the Persian parasang 6006 yards; the Russian verst 1167 yards; and the Turkish beri 1856 yards. All the preceding statements relative to modern measures rest on the authority of the work cited.

This diversity of itinerary measures, particularly as observable in countries which were formerly under Roman sway, can only be conjecturally explained: partly by supposing that the mile (Roman) and the league (Celtic) were in process of time confounded with each other (as Ingalphus and Brabant are thought to have been the case in England), partly by recurring to the weights and measures which were multiples one of the other. [LEAGUE.] It would be much beyond us to attempt any derivation of the preceding anomalous measures, either from the mile or these lengths of the mile. We can only confine ourselves to the history of the English mile. It will be necessary to treat this subject at some length, on account of the manner in which our metrologists and antiquaries have passed it over. The legal history is simply this: that previously to the reign of Elizabeth the statute on weights and measures confined itself entirely to the regulation of the smaller standards; while in the 35th year of that queen an act was passed which (perhaps undesignedly on the part of its framers) has fixed the mile as a standard measure, particularly in the statute book. This act was appealed to as if made for the purpose of settling the question, yet in fact does nothing more than incidentally define a mile for a particular purpose. Persons are forbidden to build within three miles of London, and the mile is to be used in such cases. The statute is not to be construed only, cannot be worked at, least from the recital in the Statutes at large. It will however subsequently appear that we are not without something like a probable account of the derivation of the measure; and whatever doubt may remain upon the point, it is clear that the statute mile is constituted by an authority of the reign of James I. (Cowell) as a general declaration of the length of the mile. Previously however to the act of Elizabeth it may be doubted whether any uniform mile was in existence. Most unquestionably this must have been the case; perhaps mostly to the reign of Elizabeth the statute mile, probably not being aware of the English foot having become longer than the Roman, and intending to use the Roman mile. (See the citations in Leake.) Thus Roger Bacon, in his general description of the earth, follows except as here mentioned) the Roman mile as their mile as a matter of course, without the least warning of his being aware that he was using a mile different from the popular one of his time. In a writer then on any mathematical or cosmographical topic the mile may be presumed to be of 5000 feet. If he uses it with any connection with astronomy, and if Arabic writers were referred to, it was not unusual to use the Arabian mile of 2000 yards (according to Roger Bacon's estimation, Jeth. P.1.).

If, as we believe we shall presently show, a longer mile was in popular use, it may be doubted whether the authors above alluded to were aware of the difference. They certainly did not perpetuate such knowledge; for Dr. Bernard, the most profound of English metrologists, found the mile of 5000 feet sufficiently common in old writings to induce him to give it a name, and call it the English geometrical mile, meaning, we suppose, that principally used in mathematical writings; but he does not give the least hint that another dimension of a mile of 5000 feet, called the geometrical mile, was ever in existence. Nor does his predecessor Greaves, when he remarks that great differences have been observed between measured and statute miles, hint at such a difference as being derived from the remains of an old and different measure at any accurate at any accurate from the statute mile. This mile of 5000 feet continued in use among seamen, whose measures depend more upon writers on navigation than on acts of parliament, until the earth's dimensions by the orbit of 1644 were discovered. A very sound notion as to the earth's magnitude gave 60, or at least 65, Roman miles to the degree. The sea mile tallied with that of writers on shore, until the measures of Picard, &c. became well known; but the sixtieth part of a degree of latitude is so convenient a standard measure for the sailor that under the name of a nautical or geographical mile it
has lengthened with the common estimation of the degree of latitude. Thus in the time of Gunter we find the degree described as 60 miles of 5000 feet each; though he certainly says (On the Cross-Staffe, b. xi., cap. 6) that by compass of observations, he thinks 332,000 feet nearer the truth. Even almost as late as the Revolution common works written for landmen describe the sea league as three Italian miles, which answers nearly to 15,000 feet. By the time of Dr. Bernard however we find the sea mile described and it is certainly precised with greater precision (see note 229); but this is in a work of science and authority: and Oughtred (before the date of Bernard's book) says that it is 'taken' (or rather mistaken) that 60 statute miles make a degree. It is more than the sea league would in the first instance be taken from the compass, and certainly 15,000 feet, or 274 statute miles, is almost the same as the length which different deductions will give for the old land league.

We now proceed to the main question, the length of the old English mile: premising that the utmost we can attempt is a clear proof that the old popular mile differed considerably from the modern mile. The gradual changes of this old mile (which the general history of itineraries must have shown) with the investigation of antiquarian authorities than mathematicians have been wont to make, and better estimation of their relative values in a mathematical point of view than antiquaries have hitherto been capable of making.

Ogilby and D'Anville, according to de Bure (Sir H. Ellis, Preface to Domesday) that this old mile was somewhere about a statute mile and a half. This tradition is not to be relied on: for though in all probability it agrees with the truth, yet it may have arisen from another circumstance quite different. It is our opinion that even within the memory of man, distances were measured in the remote parts of the country by a longer than the statute mile; for instance, that York was said to be 130 miles from London, while it is really more than 199 statute miles. This is perfectly true; but the reason is perhaps different from that given, as the following account will show:

The first actual measurement of the roads in England, in which Ireland was included, was made by John Ogilby, a correspondent of Charles II, and was published by him in 1675, under the title of Britannia, with copious descriptions, and 100 copper-plates of the roads, in a large folio volume: the instrument used was called by him a sectet-dimensionarius, and a set of these works were printed for the benefit of the Dutch edition of this work were published, of which we have seen three, and D'Anville mentions a fourth. It is worth noting that this measurement, as compared with older ones, soon came into general use; thus in a little work for men of business, known by the title of 'The Traveller's Daily Companion,' London, 1684, we find a list of Ogilby's distances from town to town, compared with those formerly adopted. The latter were called by Ogilby computed, and the meaning of this word might be doubted, but it is proved to mean miles in common use by previous publications. Thus in Samuel Morland's Description and Use of Two Arithmetic Instruments, &c. (1673 or two years before Ogilby's publication), we find the distances called computed by Ogilby set down as the (supposed) real distances. D'Anville appears to have seen an edition of Ogilby (of which there is one at least) in which the word computed is always contracted into com. This he supposed to mean common, and the whole of his chapter on English itineraries (Moyens itinéraires) is based on this meaning. It must be read cautiously, as he assumes it to be indisputable that there was a common mile in use at the Revolution, which was about a quarter longer than the statute mile. But on the authority of the silence of Bernard and Greaves, and above all, of our own commonwealth, I must differ, and must suppose that the computed miles preserved by Ogilby had been intended to represent the number of statute miles, but erroneously given.

The measured and computed miles of Ireland, which had served the common purpose in the estimation of distances? The word computed never meant repeated, but was always applied to a result of reckoning of some kind or other. Ogilby says, 'Whence these computations arose is altogether uncontrived; the nearest conjecture is, that they seem to ex-

* This of course refers to the measure of Deitl, which gave 360,000 feet (4,000).
of evidence, the testimony of foreign writers. The new measures of any country found their way abroad but slowly at the beginning of the seventeenth century, and we shall not be surprised to find foreign writers of the middle and end of that century varying from then existing measures in their statements. We shall first take the geography of Varenious, first published in 1650, and edited in 1672 by no less a person than Newton, the great mathematician. The following sentence is followed by the editor to pass without comment:—"Triglypha habenti Angli miliaria: majora, quaorum 2748 sequent gradum sive 19 Hollandica: media quorum 50; minima quorum 50 vel 55. Now it is designed to supply himself as well as by maintaining 18,000 Rhineland feet, each of which, according to Dr. Bernhard, is 1033 English feet. Whence it may be deduced that the three miles described as English by Varenious severally contain 243, 133, and 111 statute miles (taking one mile to be 5280 feet). We have no doubts that Varenious has here got hold of the leucas, the old mile or half the leucas, and the modern statute mile, which, being not sixty years old when he wrote, was not, though the contemporary legal measure, more accurately known than the others. Again, Ozanam, in his "Mathematical Dictionary," A.D. 1691, makes the English mile a quarter longer than the Italian mile, that is, considerably above the statute mile; but his accounts of itinerary measures are so evidently theorised and bound up with thousands of geographical considerations, that no dependence can be placed on any specific results drawn from them. If his geometrical pace be five French feet (Pauton, p. 179), this English mile (which he states at 1250 paces) is 6250 French feet, or 2219 English statute miles (226 statute miles). But this is but of no worth no notice, for no value of the geometrical pace can be taken which will make Ozanam's account of measures consistent with itself. We shall take one more conjectural determination of the mile, derived from the sea league of the seventeenth century. Ozanam states that at this miles three miles 5000 feet in a mile, the league being the twentieth of a reputed degree. The author of the 'Exact Dealer's Daily Companion,' above cited, calls it three Italian miles, or 4904 yards. Now, if the original designer were the land measure, and Ozanam's half the leucas would have been 2452 yards, or 1/4 statute mile.

D'Anville endeavours to make the old mile the same thing as the original French league, or the Roman mile and a half [Lexograp], taking the computed mile, already discussed, as the old mile. But independently of the mile thus considered not being long enough (and we have no instance of an itinerary measure shortening by time), the distinction between the mile and the league seems to have been unknown until a common notation from the time of the earliest manuscripts; and previous to this time the confusion which might have made D'Anville's supposition true had already lengthened the league by 500 paces.

The only way of detecting the length of any measure, a copious and absolutely preserved, is by the knowledge of some quantity, which having been handed down in terms of the old measure, and being still in existence, can be re-estimated in terms of the new measures. Unfortunately we have no very exact measurements of well-known lengths; nevertheless by using such as we have, and taking the mean of a considerable number, the odds are much against any very serious error remaining in the result.

About 1475 William Botoner, commonly called William Webster, a wealthy inhabitant of Worcester, took his tour in various parts of England, and wrote, apparently for his own use, a large number of memoranda, which remained in the library of Corpus Christi College, Cambridge, and were published in 1778, by Dr. Nashpury, with the title "Itinerares Wilhelmi de Worcester." The date of the writer is well settled, for he asserts that in the year 1473 he presented to the bishop of Winchester his own translation into English of Ciceron de Senecetiae. This William of Worcester was given to measure distances, and he records the dimensions of the churches through which he visited, and the number of miles between the several towns. From the latter enumerations we have collected the most definite instances, which we have compared with our latest road-books, as follows (W is the number of miles in W. of W.'s account; R in the road-books):

<table>
<thead>
<tr>
<th>From Oxford to Farringdon</th>
<th>W.</th>
<th>R.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farringdon to Wooton Bassett</td>
<td>11</td>
<td>12</td>
</tr>
</tbody>
</table>

Gloucester to Tewkesbury
Shepton Mallet to Glastonbury
Glastonbury to Bridgewater
Bridgewater to Taunton
Taunton to Wellington
Wellington to Collumpton
Collumpton to Exeter
Owter St. Mary to Exeter
Plymouth to Salislar

Totals
1314

To give the best chance of a correct result which our present means afford, we must increase this 1314 modern road miles in such proportion as will make correctly represent the same roads at the time when William of Worcester travelled. This we have done, and the only supposition we make must rest on its own intrinsic probability. To neglect this correction altogether would make the preceding give 100 old miles equal to 141 statute miles, and this is the lowest conclusion which can be formed. But if five per cent of deviation has been corrected since the old account, that is, if what is now 100 miles would have been 105, then 100 old miles may be stated at 148 statute miles. This conclusion, and even a stronger one, may be reinforced from a totally distinct quarter. But first let it be said that an account which is now 170 miles in length, but the contrary, it may be inferred that such of the preceding instances as make the old mile least are most probably those in which the distances have been shortened; and instead of being the cases of most weight, are precisely the reverse.

Though the preceding instances are quite sufficient, yet it may be satisfactory to name one or two short distances in which a very large mistake is impossible. The following were the only cases of the kind that we have found:

William of Worcester says that Wokey Hole is about half a mile from Wells, whereas, by the Ordnance Map, it is a mile and six-tenths in a straight line from the centre of the castle. Again, Molyneauxber looking for Lincoln Castle by him at two miles from Wells on the opposite side: it is now three miles and three-quarters in a straight line from the centre of the town. Lastly, Fenny Castle is said to be a mile and a half westward as the suspect, whereas what is now called Castle Hill is two miles and three-quarters westward. These instances are more convincing than the preceding as to the mere use of a longer mile, though not so well adapted for its determination.

We are now ready to turn to Palestine. In the description of the earth given by Roger Bacon (Jebb, pp. 180-236) he generally follows Pliny, and gives distances in Roman miles, except only when treating of those parts which the Crusaders visited, and other Eastern countries. In this case he makes account Bacon of much on the conversation and writings of certain Williamus, who went on a mission from the king of France to the Tartars in 1253, and on the oral accounts of other travellers. But the country on the distances of whose land he is most precise in his information is Palestine itself. By taking fifteen well-defined instances, and measuring the corresponding distances on Major Rennell's map in parts of inches, we have the following, the first column being the number of leucas in each of the roads in the map of Rennell. (We omit sea-distances, as likely to err considerably.)

<table>
<thead>
<tr>
<th>From Gaza to Ascalon</th>
<th>W.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ascalon to Joppa</td>
<td>12</td>
</tr>
<tr>
<td>Joppa to Aco</td>
<td>24</td>
</tr>
<tr>
<td>Aco to Cesarea</td>
<td>10</td>
</tr>
<tr>
<td>Aco to Tyre</td>
<td>9</td>
</tr>
<tr>
<td>Tyre to Saro</td>
<td>9</td>
</tr>
<tr>
<td>Saro to Aco de Sidon</td>
<td>34</td>
</tr>
<tr>
<td>Sidon to Baruth</td>
<td>31</td>
</tr>
<tr>
<td>Baruth to Gibelet</td>
<td>9</td>
</tr>
<tr>
<td>Gibelet to Tripolis</td>
<td>9</td>
</tr>
<tr>
<td>Tripolis to Joppa</td>
<td>13</td>
</tr>
<tr>
<td>Joppa to Jerusalem</td>
<td>9</td>
</tr>
<tr>
<td>Jerusalem to Jericho</td>
<td>67</td>
</tr>
<tr>
<td>Saratia to Jerusalem</td>
<td>12</td>
</tr>
<tr>
<td>Samaria to Cesarea</td>
<td>12</td>
</tr>
<tr>
<td>Aco to Nazareth</td>
<td>72</td>
</tr>
</tbody>
</table>

* With it was published the 'Itinerary of the Holy Land,' by Simon Simon, and taking the title of the book, looked under the name in the Catalogue. With it was also published the tract on Levantine Veneries referred to in the article on that subject.
The scale of Rennell's map is three inches to a degree of latitude, and the remainder of the distance must be the same as the distance in the shortest line from place to place, to be increased or decreased for the deviation of the roads. We must assume that the deviation was equal to that in England at the Revolution, which was 16° 03' in the proportion of 100 to 125, which gives 2° 35'. It must be remembered that the allowance is made for deviation, the longer is the league; and we think it is the least supposition which can be made, to suppose the deviation on routes in Palestine no greater than in France, which is the practice of the Oriental geographer Abu Rihan (Aburini or Birinius) to deduct one-fifth from distances measured on the roads, to obtain the true distances in a straight line. This amounts to increasing the number of miles measured on the map in the proportion of 100 to 125, and is practically accordant with the preceding rule, if the reader consults the annexed table and note.

In 1422 Sir Gilbert de Lannoy was sent by Henry V. of England on a tour of military observation in Egypt and Syria; and his report is entitled 'Travels in the Holy Land' (in the Bollandist in the 21st volume of the 'Archaeologia.') He never mentions the league more than once or twice, and gives all his distances in miles. From his account of Egypt we infer that he measured, which agrees with modern travelers. He places the city of Cairo, for instance, three miles from its port Bokkal, which distance is now called only one mile. [Kahira.] But on examining his distances in Palestine there appears almost a certainty that he used numbered paces as are by half (and not two) make the league of Roger Bacon. The following are the comparisons which his work affords us the means of making:

| From Joppa to Acre | 24 | 60 | 2:5 |
| Acre to Tyre | 9 | 25 | 2:78 |
| Tyre to Sidon | 8 | 20 | 2:5 |
| Sidon to Brutha | 16 | 25 | 2:54 |
| Jerusalem to Joppa | 30 | 12 | 2:5 |

But even Lannoy's mile must be longer than our statute mile; it is difficult to explain the difference. One thing is certain, that Lannoy's mile in 1422 cannot be the same as our statute mile in 1422, or that of Bacon in 1256, being shorter than either.

So far our conclusions proceed upon assumptions of the highest probability; and the result is, that from the English measurements we may infer that 100 ancient miles certainly exceeded 141 statute miles, while from those in Palestine they are most likely not much less than 133 such miles. It is highly probable that the result is nearer to 153 than to 141. If we were to take a mean of both results, giving them equal weight, the mile thus obtained would be probably too small, and this result is 1° 47', so that (as mentioned in LEAGUE) the ratio of 145 to 100 (misprinted 45 to 100) is the very least which is admissible, and perhaps too small even for a minimum. It seems to us that a more probable result would be obtained by 145 as a result of the measure in Palestine (for it is hard to believe that the correction for deviation could have been too much), and giving this number twice as much weight as 141 in forming a mean of the two. This gives 145 in place of 147, or roughly so, and (as courts) make the most probable that 100 ancient miles are as much as 150 statute miles, and tolerably certain that they exceeded 145 such miles. At the same time there is evidence enough that very different miles are used, and also most ignorant confusion between ancient and modern measures frequently existed. Sir John Maunder, for instance, says, "After the astronomers of antiquity, 700 furlongs of the answeren to a degree of the firmament: and the 87 miles and 4 furlongs. Now be that here multiplied by 360 sithe, and then be their 31,500 myres, every of 8 furlongs, after the account of our commen- temors authors use the stadium, which is here made to be the English furlong, a measure with which it had no connection."

There is certainly this difficulty in the way, that LEAGUE required the ancient minimum distance between two market-towns must have been 19 modern statute miles, which seems a great distance. But it must be remembered that this appearance is a consequence of the notions derived from the modern interpretation of the text, which make the 'leagues' equal to 10 statute miles; so that seven miles has long been the legal distance. This interpretation is so preposterous that it must be thrown aside; for even if the mile of Bracton and Fleta were the mile of the books, and not the mile of the people, the leuca of 3 miles with 145 as the number of statute miles per mile, or even better, taking into account the badness of roads in the century, we allow even as much as two hours for this, then the day's work would be only six hours. According to our reading the time of going nine miles and a half would be the time of business; or allowing the half-mile of 147.5 as the usual distance, the day's work would be something more than nine hours. It may however be possible, and not improbable, that the mile of 5000 feet, or that of the books, was that of the courts of Ingulphus, which would give about 124 statute miles as the distance in question.

We conjecture that the length of the ancient mile arose from that confusion between the mile and the leuca which is referred to by Ingulphus. LEAGUE] The leuca of fifteen hundred paces in 1422, or 1 mile, is, as the old length, be 1° 42 modern statute miles, to which the term mile being applied, we have the probable beginning of the old mile, that is, we adopt D'Anville's conclusion on different grounds. If in the meanwhile the leuca of 2000 paces came into use (as, according to Ingulphus, it did), which would be called in the books two miles (as in fact it was two miles of the sciriere), it is by no means surprising that a new leuca of two long miles should be formed from the old mile of the Romans. We do not venture to conjecture for the establishment of a measure; but it has great force in reference to a mile, the existence of which is separately proved. And though Ingulphus states that the word leuca was introduced as meaning a mile, yet it is more likely that the new measure had been designated by the old name, the new name for the old measure: it is moreover tolerably certain that the conquerors would attempt to introduce both their measure and its name, while the people would be able to resist the latter, but not the former. The origin of the statute mile may perhaps be explained as follows:-The furlong, or quaranta, was not a part of the Roman itinerary system of measures. It grew out of the perch, or pericata, a measure originally of small lengths, as in buying or selling of land, 40 of which were made into one by the simple name of forty-long, or furlong. The great variations of the perch, in different parts of the country, induced the legislature, at a very early period, to fix it at five yards and a half. It did not harmonize with the book-system of measures, and we see [LEAGUE] that when it was introduced there, the mile was awkwardly described as seven furlongs and a half, three perches, and two palms. The legislators of Elizabeth, who were well acquainted with the stadium, seeing the mile of the books and maps of seven furlongs and a half might very naturally restore the nominal accordance of the old and modern systems, and at the same time avoid fractional quantities, by lengthening the mile into eight furlongs.

MILFORD HAVEN. [Pembrokeshire.] MILDHAIU, a town in France, in the department of Aveyron: in 44° 5' N. lat. and 3° 30' E. long.; on the road from Paris to Narbonne, through Moulins, Clermont, and St. Flour; the distance is not given in the road-books.

Milhu is said to have been known to the Romans by the
name of "Amilianum," a name which indicates a Roman origin. It is now about 1,200 feet above sea level, and was one of the strongholds of the Calvinists. Louis XIII. possessed himself of it in A.D. 1629, and ordered the fortifications to be destroyed. The town is situated on the right bank of the Tarn, in a pleasant valley surrounded by hills covered with peach and almond trees. It is well laid out, but the streets are narrow. Many of the houses and the public fountains are handsome: there is a good "place" or square and some agreeable promenades. There is a bridge of stone, which is said to be 300 years old and is called the "Pont de Rancourt." It is sold under that name, is made in the neighbourhood in cellars hollowed out of the rock. Considerable trade in raw and spun wool, leather, timber for various uses, wine, and a famous bitters, is carried on. There are a subordinate court of justice, a commercial court, a board of trade, and some fiscal government offices; an agricultural society, a high school, a drawing-school, and an hospital. There is a Protestant church, under the direction of the Presbyterians of St. Andrews.

The arrondissement of Millau has an area of 722 square miles, and comprehends 39 communes: it is divided into 9 cantons or districts, each under a justice of the peace. The population, in 1831, was 65,503; in 1851, it was 65,800.

MILITARY FRONTIER (Hungary).—This is the name given to a tract of country which extends from the Adriatic Sea to the Bakowina, between the frontiers of Illyria, Croatia, Slavonia, Hungary, Transylvania, and those of Turkey and Servia. It is called the "Habsburg Patrimony," from the Habsburgs, in the Adriatic, as in 45' 8, to the de slie of Ostrogo, in 25' 29' E. long., and between 44' 71 and 45' 26' N. lat.; its breadth varies in different parts: the area is about 15,000 square miles. The whole of this district is divided into 5 Military Circuits: 1. the Western or Croatian Military Frontier; 2. the Slavonian Military Frontier; 3. the Hungarian or Banat Military Frontier; 4. the Transylvanian Military Frontier.

This tract is distinguished from the rest of the Austrian monarchy by having been purely military government. All the peasants are soldiers, of whom, in time of peace, 45,000 men are always under arms; but in 1815, before the peace, there were 62,000. This force was originally intended as a barrier against the inroads of the Turks. By this tenure the peasants are more hospitable to the state than the usurious foreigners.
armies either for the purpose of covering and defending certain tracts of country or preparatory to the commencement of offensive operations against an enemy.

A position is considered as advantageously chosen when it is on elevated ground; when it is not commanded by eminences within the range of artillery; and when, from the existence of natural obstacles such as rivers or marshes, on the flanks, it is incapable of being turned, that is, the enemy cannot without making an extensive movement get to the rear of the army by which the position is occupied. In the event of such points of support being wanting, the position, whether it be at the rear or in an eminence, should have its flanks protected by villages, or by redoubts raised for the purpose; for the flanks being the weakest points of the line, since the troops there are only defended by their own fire, they particularly require to be strengthened by the impediments of the ground or by fortifications, in order that the enemy, in any attempt to turn the position, may be retarded till reinforcements can be brought up to oppose him.

The advantages possessed by an army on commanding ground consist in the troops being able to see the manoeuvres of the enemy while their own are concealed; the fire also, being directed downwards, is more effective than that of the enemy, which is made upwards from a lower level. The existence of woods or hollow ways in front of a position is considered at one extremity of strategy; a body of troops thus situated might have to be divided; while at the other, it might be split among divisions or parties for the purpose of attacking the line by surprise; but, on the other hand, a wood in the rear, if it should not be such as to create an impediment to the passage of the troops through it, might become a strong position in case of attack.\footnote{The wood in the rear, if it be such as to obstruct the passage of the troops through it, might become a strong position in case of attack.}

A village or even a single building on the ground occupied by the army may become the key of the position; and, consequently, the preservation of this point depends upon the superior position of the field of battle, such points being well supported by troops and artillery. At the battle of Corunna in 1809, the village of Elvina was twice contested by the opposing armies; and on the field of Waterloo, the Château de Montreau may be considered, since it was so strongly engaged with the greatest violence. The highest point of ground, particularly if near the lines of operation (the roads leading to the magazines), may also constitute the key, and is usually strengthened by one or more redoubts.

It is evident that advantages as such are disproportional to the centre of the line, because, on any change in the disposition of the latter, the key might still be retained, and, if the wings are separated from each other, it might prevent either of them from being cut off by the enemy; whereas the destruction of other impediments, such as the key, or the army taking place, become so remote as to be incapable of being supported.

The elevated ground which constitutes the position should be of a position itself, on which the troops should not must exceed the extent necessary for this purpose, lest, not being able to defend the whole, the army should be deprived of the advantages arising from a superiority of command, in consequence of the enemy gaining some part of the height.

However favourable a position may be with respect to the elevation of the ground, that circumstance will be of small value if the troops and artillery cannot be conveniently placed on it. It is indispensable that the ground should be smooth and easy to support the formation of troops in which the strength of the army chiefly lies; and at the same time it may be observed that, in making choice of a position, the ground in front should be as much as possible disadvantageous in that respect for the enemy.

The facilities which the rise of the ground in front of the battle of Rio Seco in 1805, placed his army in such a situation that the ground before it was in the highest degree favourable for the action of the French cavalry, were offset by the extremely numerous artillery, which could be placed when and where with most effect; and when the ground occupied by an army presents alternately salient and retired points along the front of the line, the batteries should be placed at all such points. At the former, in order that the enemy, contemplating the approaches by which the enemy's columns may advance; and at the latter, that they may defend the descending ground immediately in front of the others. Infantry may occupy any kind of ground, but should, if possible, always form a close line; it is usually placed between the batteries; and, if exposed to a distant cannonade, the troops may be drawn up in a trench, the earth from which will serve to cover them without preventing them from marches to support the enemy. Cavalry must be posted on a level plain, over which it may advance with regularity when a change is to be made; if compelled to act on broken ground, it is formed into small detached columns behind one another, so that at intervals it may pass at proper opportunities. It may be observed that every disposition of an army for defence should correspond to that of the works which constitute a fortified place. The batteries at the advanced points of the line should have a purpose similar to that of the batteries in fortifications; and the intermediate line of troops forms a sort of curtain.

In the choice of positions for offensive operations, such should be taken as have no rivers or broken ground in front; since these would impede the movements towards the enemy: small inequalities, behind which infantry or cavalry may be concealed, are however advantageous, as they afford the means of occasionally making attacks by surprise. On the other hand, when on the defensive, the front as well as the wings should be protected by every obstacle to the progress of the enemy which nature may present or art devise; among those afforded by the latter may be mentioned the blocking up of avenues, preparatory to the battle; or the destruction, whereby, on the enemy's advance, the roads may be destroyed; rendering fords impassable and even forming inundations by constructing dams across the streams. It should be observed however that when a defensive position is covered with a river, the line of communications should be kept open in rear of the latter, in order that sufficient space may be afforded for the troops to act against the enemy in the event of his forcing a passage across; and, in all cases, every obstacle which may hinder the communication of the position ought to be removed, that the troops may easily succour each other when attacked. Whatever be the nature of the obstacles opposed to the enemy, they should be within the range of the artillery of the line; and then the position should be considered as secure, since it is impossible to find it scarcely possible either to form or destroy its columns of attack on broken ground and under a destruc-

A knowledge of the art of choosing military positions is an important qualification in the staff-officers of an army; and these officers should continually exercise themselves in forming correct judgments concerning the fitness of ground for such positions. They should be able to ascertain at once, by the eye, its extent and the stations it may afford for troops of the different arms, so that those of all kinds may act with the greatest effect and duly support each other; and, consequently, they should be able to determine the order of battle which is the most advantageous for the ground to be occupied; they are also called upon to judge of the order in which the roads may present for an advance or a retreat, or for the conveyance of supplies from the magazines; and, finally, of the obstacles which the ground in front may oppose to the movements of the enemy. The reason for taking the characters of the ground in all these respects is what is called, by foreign writers, the military coup-d'œil; and this can only be acquired by a profound knowledge of the tactics of war joined to much experience in the practice of executing military surveys, and of obtaining the character of the ground from all possible points of view. These points being the supposed stations of the enemy, the staff-officer should accustom himself to observe from hence how the latter might make his attack; for then only can he judge in what manner an attack ought to be opposed; that is, what dispositions of troops and arti-
lery would be the most favourable for resisting it when made. Continual incitements, from his youth, on the subject above mentioned is stated by Livy to have distinguished the Achaean general Philopoemen, who was thus always prepared to avail himself of the advantages of ground in the disposition of troops for action.

Miltiades, the Athenian, consigned for the defence of a nation may be called the militia of that nation; but in Great Britain and Ireland the term is applied particularly to those men who are chosen by ballot to serve for a certain number of years within the limits of these realms. The reserve service differs widely from those of the conscription on the Continent; since under the latter the troops become members of the regular army, and may be marched beyond the frontiers of the state; whereas the militia is enrolled only for home service, and may be summoned to domestic guard. Nothing corresponding to a modern militia can be said to have existed among the ancients. In the Grecian states every citizen was a soldier; and every person, between certain ages, in the city and in the provinces, was obliged to serve in the Roman armies wherever they might be employed.

The military force of this country in the time of the Saxons was formed by a species of militia, and every five hydes of land were charged with the equipment of a man for the protection of the people, or particular bodies and placed under the command of the Eldermen or chiefs, who were elected by the people in the folkmotes. After the Norman conquest of the country the proprietors of land were compelled, by providing men and horses, to serve in the army. In 1295, the king and armes were granted, to defend the realm in the event of a threatened invasion. The troops were raised under the authority of commissions of array, which were issued by the crown; and the commission was sometimes vested in the lords, to whom the commissions were granted; though frequently the high constables, or the sheriffs of the counties, commanded in their own districts. This militia seems, at first, to have been liable to be marched to any part of the kingdom at pleasure; but it was afterwards prescribed, by a statute that no man thus raised should be sent out of his county, except in times of public danger. From the reign of Philip and Mary the lords-lieutenants have had the charge, under the sovereign, of raising the militia in their respective counties.

Charles I. having, by the 'Petition of Right,' been deprived of the power of maintaining a disposable body of troops in the country, found himself, in 1641, unable to support such rebellion then raging in Ireland, and in consequence induced to commit the charge of restoring peace to the care of the parliament. The latter immediately availed itself of the circumstance to get into its own hands all the military force of the nation; and in the following year, 1642, it obtained a bill that the power over the militia, and also the command of all forts, castles, and garrisons, should be vested in certain commissioners in whom they could confide. The king having, by the first act of the bill, the parliament made a declaration that it was necessary to put the nation in a posture of defence, and immediately issued orders to muster the militia; on the other hand, the king issued commissions of array for a like purpose to some of the nobility, and thus commenced that war which desolated the country for several years.

When Charles II. ascended the throne, the national militia was re-established on its former footing, and the chief command was vested in the king. The lords-lieutenants of counties were immediately substituted to the counties, and granted commissions (subject however to the king's approbation) to the field and regimental officers who commanded under them. New regulations respecting the amount of property which rendered persons ineligible to the charge of property was an act of the crown; but in the establishment; and at the same time, no one who had less than 200l. yearly income or less than 2400l. in goods or money could be compelled to furnish a foot soldier; nor could one who did not possess 500l. per annum be made to provide a man for the cavalry. Persons having less property were required, according to their means, to contribute towards finding a foot or a horse soldier. The militia was then mustered and trained, by regiments, once a year and during four days; but the king afterwards ordered to provide a man for the cavalry. At the periods of mustering, every man was obliged to provide himself with his own ammunition.

These regulations, being found to be expensive, at length ceased to be observed, and the trainings of the militia were discontinued in every part of the realm except the city of London. In 1756, under an apprehension that the country was about to be invaded by a French, and considerable bodies of Hanoverian and Hessian troops were brought over for its defence; the spirit of the nation revolted however at the disgrace of being indebted to foreign mercenaries for its defence; and those troops being sent back to the Continent, a national militia was formed, and organised under the sanction of an act of parliament in the 30th year of George II. The measure was generally popular, though it did not meet with universal approbation; and, on the other hand, was complained of as too small; for want of military knowledge and habits, this species of force could not be relied on in the event of its being called into active service. Experience has however shown that such an opinion is quite destitute of foundation; and it was soon afterwards admitted, that when well disciplined, these constitutional battalions rivalled those of the regular troops in the performance of all military evolutions. It may be observed here, that the greater part of the 16,000 British troops who gained the battle of Talavera were men drafted from the militia; and it is only since they joined the army in Spain, that in the action many of them bore on their accoutrements the numbers of their former corps. (Napier, vol. ii.)

The history of and remark on the 2nd year of George III., when a new act regulating the service of this force was passed; and in the 26th George III. all the previously existing statutes relating to the force were formed into one. New regulations however were made by act passed in 1813; and the militia of the kingdom is now embodied under general officers, and is subject to the provisions of the Mutiny Act, or articles of war. The king is empowered to employ it in any part of the United Kingdom, but not out of it; and it is not called upon to serve beyond the frontiers of Ireland in Great Britain: the period of service for each, out of the island to which it belongs, being at most two years. When called into active service the officers rank with those of an equal grade in the regular army, but as the juniors of each grade, and they receive the proportion for meritorious services during a rebellion or an invasion; but no officer of militia can serve on a court-martial at the trial of an officer or soldier of the regular troops.

All those who are liable to appear in the militia and not specially excepted, are liable to be chosen for private militia men and to serve either personally or by substitute. The persons excepted are—peers of the realm; commissioned and non-commissioned officers and privates serving in the standing army, with the exception of the men in the marines, and commissioned officers who have served four years in the militia; members of corps of yeomanry and volunteers, and privates serving in the local militia; seamen and persons doing duty in the royal docks, at the gun-wharfs, and powder magazines; also persons employed under the direction of the Board of Ordnance, resident members of the two universities; clergyman of the Established church, also Protestant dissenting preachers, provided they take the oaths of allegiance and supremacy, and exercise no other occupation, or only that of schoolmaster, constable, or other peace-officer; article clerks; apprentices; free watermen on the Thames; poor men having more than three legitimate children, and persons above 45 years of age, who are not residents in the parish for the militia, and who has provided a substitute, the churchwardens of the parish are bound to return to him a sum not exceeding 5l., or half the current price of a substitute. No one having served personally, or by substitute, during 3 years, may be made the substitute of a poor man or a substitute again till it comes to his turn by rotation; but if a man has served as a substitute for another, this does not exonerate him from serving again if chosen by the ballot.

The militia must be mustered, and trained twice in a year, and during fourteen days each time, or once in a year for twenty-eight days, at the discretion of the lords-lieutenants or their deputies.

The supplementary militia is an additional body of men which was first raised in 1793, for the defence of the country at that juncture. It is still continued to be raised when
the necessities of the state require it, and it is subject to the same regula
tions as a wordy militia. The local militia was largely raised in 1809, for
the purpose of repulsing certain districts, the corps of volunteers. By the 32d
George III, this force may be marshaled to any part of Great
Britain in the event of a rebellion or an invasion, and it may
be kept embodied whenever the need arises. The force was
terminated or the latter repelled. Persons enrolled in the
local militia cannot be compelled to serve in the regular
militia till one year after their period of service in the former
has expired, so the whole amount of the several militia forces in Eng-
land alone exceeds 200,000 men; and during the late war,
when an invasion of the country was apprehended, the
force which might have been assembled in arms amounted to
more than twice that number of men. In the provinces from the provinces
during the reign of Louis XIV.; but the several corps were
dispersed after the peace of Ryswick. In 1726 was or-
ganized a force of the like kind, consisting of men chosen
directly from the towns and villages, and held in readiness to
be assembled when required: and in 1778 these provincial
troops were formed into 106 battalions. Since the great
Revolution, the National Guard may be said to constitute
the militia of France.

In France a military militia of the United States of America, by an act passed in
1792, the principal provisions of which are still in force, all
able-bodied white male citizens between the ages of eighteen
and forty-five, with certain exceptions, are enrolled in the
militia, and when drafts are to be made for active service, they
are to be chosen from those who have completed a term in the army.
The persons excepted are the executive, judicial, and rep-
resentative officers of the Union, those who are employed in the
post-office department, &c.; and, in some of the states, persons are exempted who have
served a sufficient period of service in the army or navy. The president has the power
of calling out the militia of the states; and, when on active
service, it is subject to the same rules and articles of war
as the regular troops, but court-martial for the trial of mil-
ant is not held.

A national militia is an institution of the highest utility

the soldiers of a regular army, who, devoted exclusively to
the profession of arms, and though their services are indis-
pensable, are not considered as having a direct interest in the
pretensions it in common with the civil portion of the community;
and who, except in a nation like Great Britain, where the
military power is duly subordinated to the civil magistrate,
might, under the influence of an ambitious chief, become
dangerous to the liberties of their country.

MILIZIA, FRANCESCO. According to the autobiog-
ographical sketch which he has left us, Milizia was born at
Oria, a small town of the province of Otranto, in the king-
dom of Naples, in 1725, and was of a noble and wealthy
family. When nine years old, he was placed under the
charge of his maternal uncle, who practised medicine at
Padua. With him he remained about seven years, when
he was removed from him and joined his father, who was then
at Rome, and who sent him to Naples, where he studied
law under the celebrated Gentleman, and physics and
government under the Padre Orlandi. He was
more anxious however to study the world, and set out from
Naples with the intention of going to France, but his
father, being informed of the intention, sent word to him
that he was obliged to content himself with leading a half
stupendous, half indolent life at Oria. At the age of twenty-
five, he married a young lady of family at Gallipoli, and
having obtained a handsome allowance from his father, went
to Rome, where he was totally settled with nothing but
this. It was here that he began to apply himself diligently to
the study of architecture, and published his Lives of the Archi-
chitects, or 'Vite degli Architetti piu celebri,' in 1768,
which was followed by his treatise 'Del Teatro,' in 1772,
a production quite so much scandal on account of
certain observations in it, that it was suppressed by with-
drawing all the copies; yet was soon afterwards republished
in Venice. This work was published in 3 vols. 8vo, in 1781, and considerably
improved in the third edition at Bassano, 1785, greatly extended his
literary reputation, being, at the time of its appearance,
more than the first attempt to base the art on rational
principles, and it was regarded as a model. But Milizia,
more advanced professors, who charged the author with speaking
too freely of many eminent names, with attacking au-
thorities, and propounding his own views without regard to the
example of others. His 'Arte di vedere nelle Belle Arti,' in
which he showed himself a strong partisan of Mengs,
accompanied another work written with great eloquence, and with equal
freedom of opinion, impugning Michael Angelo, among
others, with unsparing severity. He also published a work
entitled 'Roma delle belle Arti di Disegno,' and his
'Dizionario delle Belle Arti,' which latter, first printed at
Bassano, in 1797, 2 vols. 8vo, is chiefly a translation from the
Encyclopédie Méthodique.

After this, disgusted at the attacks levelled against his, 'Roma,' he not only desisted
from publishing but, and the 'Dizionario' was also
proposed of that work, but abandoned the fine arts, and took up
the study of natural history. He died at Rome, in March,
1798.

Milizia had for a short time held the appointment of
superintendent of the building in the Ecclesiastical
property belonging to the king of the Two Sicilies, but he resigned
it in 1786, not caring to have any such responsibility or tie
upon him. His 'Lettere ineditè,' addressed to the Count
Sangiovanni, and first published at Paris, in 1827, serve to
portray in the most favourable light the man without the testimony of his
other writings, to convince us that he abhorred pedantry and
dogmatism, false enthusiasm, and quackery. They
abound with very fine remarks on persons, and are seasoned
with much caustic and pungent sarcasm. An English translation of his 'Lives of the
Architects' appeared in 2 vols. 8vo, in 1826, but besides being badly executed and full of
gross errors of the press, it does not supply those names which Milizia
omitted, nor the numerous other names that ought now to
find their place in such a work.

MILK is an opaque fluid, secreted by the mammary
glands of the females of the animals belonging to the class
Mammalia, and adapted to the nourishment of their young
offspring. It is of a specific gravity somewhat greater than
water, and contains a proportion of clotting substance,
due to several acids. It consists, in addition to the watery
portion, serum, &c., of globular particles, which are not
more than half the size of the globules of human blood,
containing one in ten-thousandth of an inch. They are composed of a fatty matter (butter) and a coagul-
able substance, which in many cases resembles albumen,
termed casein.

The globules are specially lighter than the fluid in
which they are suspended, and easily ascend to the top
when the milk is allowed to stand. This constitutes the
cream, and consists of the butter, with some caseum and a
portion of serum. By agitation, such as is effected by
the various modes of churning, the fatty globules unite into a
mass (butter), leaving the buttermilk, which consists of
caseum and serum.

Milk from which the supernatant fluid, or cream, has
been removed is termed skim-milk, and still retains a con-
tent of coagulable substance, which by being separated from the serum, or whey,
by means of a rennet or any acid. This coagulated portion constitutes the
curd, and is the basis of cheese. If a rennet be used, and
all the portion coagulated by its means be separated, the
addition of various kinds of salt to the curd, this is formed:
late; and this has been termed zierger by Schubler, but it
is not certain that it differs from caseum. What remains
after both these coagulated principles have been removed
is the whey, which contains sugar of milk, or lactose, a
substance (perhaps caseamass), lactic acid, and various
salts.

The different constituents of milk, and the differences
in the relative proportions of them in some of the common
domestic animals, will be best seen in the following tables
drawn up by Mr. Pereira:—

VOL XV.—2 F
From these analyses it would appear that milk is a compound fluid, chiefly consisting of oleaginous and albuminous materials, with different salts.

According to Dr. Frout, 'albuminous and oleaginous principles may be considered already fitted for the purposes of the animal economy, without undergoing any essential change in their composition.' And thus, by the action of the organs of the parent, the food is brought into a state very favourable for its assimilation in the body of the young, without taxing severely the digestive organs of the latter. The salts present in the milk serve also important uses, especially the phosphates of lime and oxalic acid, which, at the time of birth, are soft and cartilaginous. The period of softness in the human infant should cease must vary with the vigour and progress of development of the infant; but in general nine months is the proper time for sucking, and its continuance beyond that period is injurious both to parent and child.

The milk of cows and other animals is extensively used as the food even of adults, and, though insufficient alone, is a most valuable ingredient of diet. It is often enojined as the food of invalids, especially of persons who have a tendency to consumption.

Milk is also used as an antidote in cases of poisoning by some metallic salts, such as corrosive sublimate, peroxide of tin, sulphate of copper, &c.

Though cheese is in general difficult of digestion, fresh-pressed curd is often found to suit the stomach of persons affected with indigestion in the human infant should cease must vary with the vigour and progress of development of the infant; but in general nine months is the proper time for sucking, and its continuance beyond that period is injurious both to parent and child.

The milk of cows and other animals is extensively used as the food even of adults, and, though insufficient alone, is a most valuable ingredient of diet. It is often enojined as the food of invalids, especially of persons who have a tendency to consumption.

Milk may be brought to a dry state, and powdered, in which condition it keeps for a long time; and by dissolving it in tepid water an artificial milk may be formed, capable of being used as tea, particularly for children during long voyages.

(See Mr. Persimmon's 'Lectures in the Medical Gazette.'

MILK WAY. It is desirable, in describing astronomical objects, to keep as close as possible to the words of those who are accustomed to the sight and description of such things. Two passages in Sir John Herschel's 'Astronomy' (pp. 185, 375, 376, Laddner's Cyclopædia, No. 43) will describe the Milky Way, and the theory of it, by Sir William Herschel, with excellent brevity and clearness.

'... Many popular works on astronomy contain nothing but descriptions of descriptions, in which want of exact observation is no merit, but the reverse. We recommend the work cited to those of our readers who are not already acquainted with it, so that of an actual observer whose facility of description is very noticeable among those who are in the habit of viewing the celestial bodies.'

There are not wanting natural districts in the heavens, which offer great peculiarities of character, and strike every observer: such as the Milky Way, which great luminous band which stretches, every evening, all across the sky, from horizon to horizon, and which, when tracked with dipper and mapped down, is found to form a zone, completely encircling the whole earth, almost in a great circle, which is neither an aour circle nor coincident with any other of our astronomical grannulums. It is divided in one part of its course, starting of a kind of branch, which unites again with the main body after remaining distinct for about 150°.

This remarkable belt has maintained, from the earliest ages, the same relative situation among the stars, and when examined through powerful telescopes, is found (wonderful to relate) to consist entirely of stars scattered by millions, like glittering dust on the black ground of the general heavens. 'If the comparison of the apparent magnitudes of the stars with their numbers leads to no general conclusion, it is otherwise when we view them in connection with their local distribution over the heavens. If indeed we confine ourselves to the three or four brightest stars, we shall find them distributed with tolerable impartiality over the sphere; but if we take in the whole amount visible to the naked eye, we shall perceive a rapid and rapid increase in number as we approach the borders of the Milky Way. And when we come to telescopic magnitudes, or stars of so small a magnitude as to be invisible except through a telescope, we find them crowded, beyond imagination, along the extent of that circle, and of the branch which it sends off from it, so that in fact its whole light is composed of nothing but stars, whose average magnitude may be stated at about the tenth or eleventh.

These phenomena agree with the supposition that the stars of our great system, instead of being scattered in all directions inedibly through space, form a stratum, of which the thickness is small, in comparison with its length and breadth; and in which the earth occupies a place somewhere about the middle of its thickness, and near the place where it subdivides into two borders at right angles, perpendicular to the lamina, and greatest in that of its breadth, as S B, S C, B D; increasing rapidly in passing from one to the other direction, just as we see a slight bisection in the atmosphere thickening into a decided fog-bank near the horizon, by the rapid increase of the mere length of the visual ray. Accordingly, such is the view of the constel

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218 MIL

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<tr>
<th>100 Parts of the Milk of the</th>
<th>Cream. Better</th>
<th>Sugar Total</th>
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<td>Bee (Stephen Loc.)</td>
<td>11.5</td>
<td>5.8</td>
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<td>4.2</td>
<td>25.3</td>
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<tr>
<td>Goat (Ox)</td>
<td>7.0</td>
<td>4.56</td>
<td>12</td>
<td>4.28</td>
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<tr>
<td>Goat (Papaya)</td>
<td>not stated</td>
<td>4.08</td>
<td>8.2</td>
<td>5.82</td>
<td>14.68</td>
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<tr>
<td>Cow (Stephen Loc.</td>
<td>4.6</td>
<td>2.58</td>
<td>7.18</td>
<td>3.60</td>
<td>13.23</td>
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<td>and Boar)</td>
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<td>4.5</td>
<td>6.10</td>
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<tr>
<td>Cow (Barnaby)</td>
<td>not stated</td>
<td>5.0</td>
<td>9.15</td>
<td>3.15</td>
<td>14.15</td>
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<td>Woman (Papaya)</td>
<td>not stated</td>
<td>8.2</td>
<td>7.15</td>
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<td>(Ox)</td>
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<td>8.2</td>
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<td>Ass (Stephen Loc.</td>
<td>9.9</td>
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<td>and Boar)</td>
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<td>Mare (Ox)</td>
<td>9.3</td>
<td>1.82</td>
<td>11.12</td>
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(only 2:7 according to Young.)

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MILK MIL

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tioned as contained in a zone of 16° by 3° include only those which could be steadily seen and distinctly numbered, of which only occasional glimpses could be got for want of sufficient light.

The Milky Way may be described in general terms as ex-
tending three or four degrees on each side of a great circle inclined at an angle of about 60° to the ecliptic, which it cuts in the northern hemisphere between the horns of Tau-
rus and the feet of Gemini, and in the southern hemisphere between Sagittarius and Scorpio. Beginning with the part nearest to the North Pole, it nearly covers Cassiopeia and Perseus, passes through the Great Nebula in Orion, and thus passes through Taurus and Gemini, and near the back of Caelus Major through Argo. It then narrows considerably, and passing under the hind feet of Centaurus, widens again near Aquila. A little above the last constellation, and before it again meets the ecliptic, it divides into the two streams above mentioned, which contain between them a long thin strip passing through part of Scorpio, Serpens, Aquila, Vulpecula, and Cygnus. In Cygnus the streams reunite, but immediately separate again, finally reuniting in the same constellation, from whence the main stream reaches Cassiopeia, &c.

The Milky Way was called by the Greeks γαλακτις, or γαλακτως γαλακτας (whence our word Galaxy), and by the Roman astronomers Γαλακτυς γαλακτος, the subject of which is as edifying as usual: Hyginus fixes on Eratotheon the most common story, namely, that the Galaxy arose from the milk of Juno, who pushed Hercules away from her, when he was learning that he was the son of Maia. Nor does the above accurate writer forget to mention that others held the appearance to have arisen from young master Hercules having been a greedy child, and having filled his mouth too full of milk, which then ran down the sides of his face. Another fable, mentioned by Plato, makes the Milky Way to be a broad causeway through the heavens for gods and heroes to walk upon; another, that it is the part of the heaven which was raised up from the point of the earth to the heavens by the deities

These stories are a proper prelude to the speculations of the philosophers which followed. Some of the Pytha-
goreanese are reported to have supposed the Milky Way to be an old and disused path of the sun, out of which, some said, he was formerly the Nymph Thiasia; others, a reflection from the sun. Anaxagorae is said to have thought it was the shadow of the earth: Aristotle supposed it to be sublunary, and to consist of exhalations, of the same matter as the smoke; he also attributed it to the fire of Thophrastus for a solid and luminous band, joining together the two hemispheres; while Diodorus thought it was the reflection of the sun from the cloud. The stars are said to have thought it was a vessel of the gods: a supposed opinion which both Plutarch (De Place Philos., L. iii., c. 1) and Manilius mention. Shortly after the invention of the telescope, Galileo announced that he had resolved the whole of the Milky Way into stars. Est enim Galaxia nihil aliud quam summam stellarum coeorsnuin conosuerunt conosuiter conatus: in quoque unam regionem illius suspensam dirigas, statum stellarum igneas frequentas sese in conspectum profectum quantum com-plices saepe magno et valde conspicua visident, sed exigua-
resin seunt. Inveni, igitur, perscrutando orbem terrae, quia saepe ex horribili orbe termini prodigaliter, cumque distantia, est avenire. The form, which has been often described as a cloud on the black ground of the general heavens, we know that, if the observer can be depen-ded upon, he has completely resolved the continuous light in question: but if he only says, with Galileo, that he discovered several thousand stars scattered over the Milky Way, he may have distinguished the nearer stars, and may suppose that the more distant ones still formed a Milky Way behind them. That this must have been the case with Galileo (whose tele-
scopes would never distinctly show Saturn's ring) may be concluded from, among other things, the following: Galileo had completely resolved several nebulae, and might easily have completed his assertion as to the Milky Way from analogy. Kepler (Diopt. Prap.) describes this res-
olution in a way which will be some guide as to its character:

'Nebulosa stella ostendit, ut in Via Lactae, duas, tres, vel quattuor clarissimas stellas in arcissimo spatio locatas,' that is, two, three, or four most brilliant stars in a strip of space: this may very well correspond to Sir W. Herschel's estimate of 50,000 in the zone above mentioned, without the necessity of supposing that those stars were seen, which the forty-foot reflector would only show by glimpses. Sir W. Herschel founded his star-count on the supposition that the whole field of fifteen minutes in diameter, showing about as much of the heavens as is covered by one-fourth part of the moon. If, which may be suspected, the 'arcissimum spatium' of Kepler meant the field of his telescope, the resolution thus
obtained would only give one small probable deduction; the real and necessary inference would only have been, that stars invisible to the naked eye exist in every part of the Milky Way in considerable numbers. MILL, JOHN, was born at Shap, in Westmoreland, about 1645. In 1661 he entered as scholar at Queen's College, Oxford, took his degree of B.A. in 1666 of M.A. in 1669, and was shortly afterwards chosen a fellow and tutor of his college. In 1676 he was made chaplain to Dr. Seraiph. bishop of Ely, and in 1681 obtained the rec-
tory of Bleachingdon, in Oxfordshire, and was appointed chaplain to Charles II. In 1682 he was appointed principal of St. Edmund's Hall, which office he held till his death, which happened June 23rd, 1707.

Mills is known by the title of the edition of the Greek Test-
ament, which was published only fourteen days before his death, with the following title: 'Novum Testamentum Graecum, cum Lectionibus variis, MSS. Exemplarium, Versionum, Editionum, Stili et Signorum Ecclaisiae, et in Notis.' This edition, then was the labour of thirty years, was originally begun by the advice of Dr. Fell, bishop of Oxford, and reflects the greatest credit on the diligence and critical acumen of his learned friend, that various readings from the previously collected, procured extracts from several then uncollected MSS., and added many readings from the ant-
ient versions and the writings of the fathers. Mills how-
ever made no change in the text, which was merely a re-
vised form of that of Elzevir, and the point of Robert Hume. He therefore left the New Testament readings, which amounted to more than 30,000, were at-
tacked by Dr. Whitby, in 1710, in a work entitled 'Examen Variorum Lectionum Johannis Milli,' in which he main-
tained that a collection of so many various readings tended to unsettle the text of the New Testament, and that the readings was an answer to Bentley, a personal friend of Mill's, under the signature of Phileleutherus Lapisenicus.

The edition of the Chronicle of Malala, published at Ox-
ford, in 1691, which is frequently said to have been edited by John Mill (Bentley) under Mills's direction, is an opinion which both Plutarch (De Place Philos., L. iii., c. 1) and Malinus mention. Shortly after the inven-
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scopes would never distinctly show Saturn's ring) may be concluded from, among other things, the following: Galileo had completely resolved several nebulae, and might easily have completed his assertion as to the Milky Way from analogy. Kepler (Diopt. Prap.) describes this res-
olution in a way which will be some guide as to its character:

'Nebulosa stella ostendit, ut in Via Lactae, duas, tres, vel quattuor clarissimas stellas in arcissimo spatio locatas,' that is, two, three, or four most brilliant stars in a strip of space: this may very well correspond to Sir W. Herschel's estimate of 50,000 in the zone above mentioned, without the necessity of supposing that those stars were seen, which the forty-foot reflector would only show by glimpses. Sir W. Herschel founded his star-count on the supposition that the whole field of fifteen minutes in diameter, showing about as much of the heavens as is covered by one-fourth part of the moon. If, which may be suspected, the 'arcissimum spatium' of Kepler meant the field of his telescope, the resolution thus
obtained would only give one small probable deduction; the real and necessary inference would only have been, that stars invisible to the naked eye exist in every part of the Milky Way in considerable numbers.
His ‘History of British India’ was commenced about 1806, but being a work of great labour, and the author being obliged to devote a considerable portion of his time to other avocations, it was not published till the winter of 1817-18. It is perhaps no very high praise of this work to say that it is not only the best history of British India, but the only single work calculated to convey to the general reader a sound idea of the real character of British India and Anglo-Indian affairs. But it possesses higher claims than these. It is admitted by some of the most eminent of those who have administered Indian affairs for the last ten years, that Mr. Mill’s work was the beginning of sound thinking on the subject, and that the most elaborate and nicest speculations in that country are stated by those who have the best means of knowing, to be now bearing every year more and more the impress of his views. The style of Mr. Mill’s history has been represented by some as dry and unattractive. Mr. Mill certainly does not deal much in rhetorical ornament, at least in what is usually considered such by modern writers, for his style reminds us more of the nervous simplicity and terseness of some of the ancient masters of the difficult art of writing, than that of any modern except Hobbes. A reader who is really in search of a meaning will find it in the writings of Mr. Mill with far less labour than where it is to be sought for in a crowd of unapt and unnecessary words. These remarks may be said to be applicable rather to Mr. Mill’s style than to his style. But though not possessing narrative powers of the same kind as Sir Walter Scott or even David Hume, there are passages of Mr. Mill’s history which will interest many readers as much as the most spirit-stirring romances; for instance, his account of the actions of Clive and the night attack upon the outworks of Seringapatam. His narrative of military operations is good; clearness, in which Mr. Mill excels, being the principal quality required. And some of his characters, that of Clive in particular, are drawn in a few bold and forcible lines, which engrave them on the mind of the reader.

In consequence of the ability and knowledge of the subject displayed in his history, and although he had in some parts come with a certain carelessness in the conduct of his business with the East India Company, the Council of Directors in the spring of 1819, introduced him into their house-establishment, and intrusted to him the chief conduct of their correspondence with India in the revenue branch of administration. He afterwards rose, in the course of promotion, to be head of the department in the India House of correspondence with India.

About three years before his appointment to his office in the India House, Mr. Mill became a contributor to the ‘Supplement to the Encyclopaedia Britannica,’ his principal contributions being in the sections on Education, Jurisprudence, Law of Nations, Liberty of the Press, Colonies, and Prison Discipline. These essays were reprinted in a separate form, and are probably the best known of Mr. Mill’s productions. They exhibit great power both as logic and as a mode of expression. It is generally believed, more marked effects than any other, not only of the works of Mr. Mill, but of any other writer of this age on such subjects, on the minds of his contemporaries.

His ‘Elements of Political Economy,’ whatever may be its merits or demerits, and it made no pretensions to originality, published in 1821-2, has at least the very great merit of being written with his usual clearness and precision of language.

In this he published his ‘Analysis of the Phenomena of the Human Mind,’ a work on which he bestowed more of the labour of thought than on any of his productions. In this work Mr. Mill has attempted to resolve all the powers of the human mind into a very small number of simple elements. From a number of the most complicated cases of consciousness, he arrives at the conclusion that they all resolve themselves into three simple elements—sensations, ideas, and the train of ideas. He thus presents by the same method of analysis his conclusions by the method of ideas. ‘We have two classes of feeling: one, that which exists when the object of sense is present; another, that which exists after the object of sense has ceased to be present. The one class of feelings I call sensations; the other class I call ideas. (De la nature des Phenomenes de la pensee du vivant, p. 40.)’ Mr. Mill begins with the simpler, and thence proceeds to the exposition of the more complex phenomena. ‘The feelings,’ he says, which we have through the external senses are the most simple, at least the most familiar, of the mental phenomena. Hence the propriety of commencing with this class of our feelings—sensations. Analogy leads us to this conclusion, under which head he ranges the feelings which we have by the five senses—smell, taste, hearing, touch, and sight. 6. Sensations of disorganisation, of the approach to disorganization, in any part of the body. 7. Muscular sensations, or those sensations which accompany the action of the muscles. 8. Sensations in the alimentary canal. He next proceeds to ideas, or the copies or images of sensations. He then treats of ideas put together or associated in trains, and of the order of their association and the causes of that order. He then proceeds to complex ideas or clusters of ideas, he finds it necessary to explain the process of naming, or language; that process by which the sensations and ideas of one man are communicated to another, and by which likewise a record is preserved of sensations and ideas after trains. One who has been the object of imagination—whence, he says, have erroneously created into what they called powers of the mind: whereas, he says, consciousness and sensations and ideas applied to sensations and ideas, and to simple or complex; to all the feelings of our sentient nature; and conception a name applied only to ideas, and to ideas only in a state of combination. In this sense, which is not at variance with Mr. Mill’s explanation of them, both consciousness and conception may be called powers of the mind.

In imagination, he says, is the name of a train of ideas, and it is an image, and in imagination is a train of ideas; and when I am said to imagine, I have the same thing; nor is there any train of ideas to which the term imagination may not be applied.

There is great diversity of trains. Not only has the same in the East India Company, and one merchant, and trains respecting the goods in which he buys and those in which he sells are habitual in his mind. Another man is a lawyer, and ideas of clients and fees, and ideas of persons, and ideas of points of contentation, and the practice of his court, are habitually passing in his mind. Ideas of another kind occupy the mind of the physician; of another kind still the mind of the warrior. The statesman is occupied with a train different from that of the merchant, and one statesman with a very different train from another, according as his mind is running upon expedients which may serve the purpose of the day, or arrangement which may secure the happiness of the population from generation to generation. In this manner there are two characters which habitually occupies the mind of the mathematician. The mind of the metaphysician is also occupied by a train distinguished from that of other classes. And there is one man yet to be mentioned, the poet, the peculiarity of whose train has been a subject of particular observation. To such a degree indeed have the trains of the poet been singled out for distinction, that the word imagination, in a more restricted sense, is appropriated to them. We do not call the business man’s travel on the roads, or the statesman’s journey of imagination. We do not speak of them as imagining when they are revolving each the ideas which belong to his peculiar occupation; it is only to the poet that the epithet of imagining is applied. His train or trains analogous to the trains by which he receives the name of imagination.

In some parts of his book Mr. Mill has, we think, been led into error, in part probably by carrying his notion of of history into philosophy, as an illustration of these phenomena too far. Thus in the discussion on classification, by distinguishing how long men had been led away by mere jargon from the real nature and object of classification, he says, ‘Man first becomes acquainted with individuals. He first names individuals himself, and the phenomena of the phenomenon cannot have innumerable names. He must make one name serve for many individuals.’ After then alluding to the case of ‘synchronous sensations so concreted by constant coexistence as to appear, though numerous, only one;
which the ideas of sensible objects, a rose, a plough, a house, a ship, are examples"—he thus proceeds: 'It is easy to see wherein the present case agrees with and wherein it differs from those familiar cases. The word man, we shall say, is first applied to an individual; it is first associated with the idea of that individual, and acquires the power of calling up the idea of him; it is next applied to another individual, and acquires the power of calling up the idea of him; so of another, and another, till it has become associated with an indefinite number, and has acquired the power of being operated upon with a variety of ideas. In short, the number of the people in a city is not differently. What happens? It does call up an indefinite number of the ideas of individuals as often as it occurs; and calling them up in close connection, it forms them into a society employed, the daily round of business. He who says there can be no difficulty in admitting this, 'because it is an acknowledged fact.' Mr. Mill himself furnishes what he considers the reason, for he says, 'It is also a fact that when an idea becomes to a certain degree complex from the multiplicity of the ideas it comprehends, it is no longer indistinct.' Thus, when the word man calls up the ideas of an indefinite number of individuals, not only of all those to whom I have individually given the name, but of all those to whom I have in imagination given it, or imagine it will ever be given, the combination of his ideas forms, not only a very complex idea, and therefore indistinct.' (Ibid.)

Mr. Mill having gone through an exposition of abstraction, memory, belief, rationalization, evidence, and some of the other ideas of the second volume of his Analysis to the phenomena in which the sensations and ideas are to be considered as not merely existing, but also as existing to action. He treats of pleasurable and painful sensations, and of the causes thereof. He proceeds to the painful sensations. Then he ideas of the pleasurable and painful sensations, and of the causes of them. He treats of wealth, power, and dignity, and their contraries, of our fellow-creatures, and of the objects called sublime and beautiful, and their contraries, too. Section 22 is devoted to the subject of motives; and Chapter 24 to that of the will. Chapter 25 (the last) to intention. Mr. Mill's exposition of all these phenomena is mainly grounded on the law of association, by which he means simply the fact that what has been repeated in any form has an inclination to be repeated in some similar form, which, in his estimation, is that the order of occurrence amongst our ideas is the order of occurrence amongst our former sensations, of which those ideas are the copies.

Mr. Mill's last work was the 'Fragment Macintosh,' published anonymously in 1838. This was a severe criticism upon the 'Essay on the History of Ethical Philosophy,' contributed by Sir James Mackintosh to the 'Encyclopædia Britannica.' This work contains some very valuable disquisitions on morals, legislation, and jurisprudence. It draws a very clear distinction between these subjects, which are often confounded. Mr. Mill wrote several of the principal articles in the early numbers of the 'Westminster Review.' Among the contributions which are considered his best, are the articles on the 'History of Politics,' in No. XI., and the article on the 'Ballot,' in the No. XXV.

Mr. Mill died at Kensington, June 23, 1836. MILLAR (Professor), JOHN, son of the Rev. James Millar, minister of the parish of Trotts, was born in that parish on the 22d June, 1735. Two years after, his father was translated to the parish of Hamilton in the same presbytery, and young Millar was about the same time placed under the charge of his uncle, Mr. John Millar of Milnagh, a most excellent man, and expressive. He was educated at the University of Glasgow, where he was put by his uncle to the school of Hamilton, and thence sent to Glasgow college, where he distinguished himself by his diligence and attention. He was at first designed for the church; but while at college he adopted the resolution of devoting the whole of his time as a medical preceptor to the eldest son of Lord Kames, in whose family he spent two years, during which he formed an intimacy with David Hume and other eminent individuals. On the 9th of February, 1766, Millar passed as advocate at the bar of the court of session at Edinburgh, and was appointed to the bar of that court at the end of the year 1799, when he was seized with an inflammatory complaint, from which he died in the following year. He was married in 1768, and is survived by his widow. MILLER, a Latin word meaning a period of a thousand years, is applied by ecclesiastical writers to the period during which it is predicted in Scripture that the righteous shall be in trouble, which is to be preceded by the overthrow of her enemies, accompanied at its commencement by the first resurrection, or the resurrection of the saints, and followed by the destruction of Gog and Magog, and the general judgment. (Rev. xx.)

The elaborate article of which the above quotation is a part has been written by Dr. Francis Jeffrey, who is supposed to have been a pupil of Professor Millar's.
Respecting the state of the church during the Millennium two opinions are held, both of which can be traced to the earliest ages of Christianity. One is that Christ will reign in person upon the earth at Jerusalem, that the saints will reign with him and enjoy corporeal pleasures, and that the Jews will be restored to Palestine and exalted to the first rank among the nations of the world. This doctrine was held by Irenaeus and others of the earlier fathers, not merely as their own opinion, but as the faith of the church received from the Apostles. These tenets were also held by Lactantius, who expected the Millennium to commence very soon after the time at which he lived. On the other hand it was held by Jerome and other fathers, who warmly opposed the doctrines just mentioned, that the passages of scripture on which they are founded must be taken in an allegorical sense, and that the Millennium will only be distinguished by the universal diffusion of pure Christianity in the world, and a consequent decrease of physical and moral evil. This opinion was adopted as the belief of the orthodox church, and has been almost universally received in modern times. The followers of the late Rev. Edward Irving and some other small sects, as well as many individuals among other bodies of Christians, still hold the doctrine of the personal reign of Christ on earth. Such persons are commonly called Millenniumarians, the name applied in the early ages of the church, together with the corresponding Greek word Chiliasm, to those who held these opinions. (Lardner's Credibility; Middleton's Free Enquiry, page 46.)

Milleporidae. In the Linnaean 'Systema Naturae' the genus Millepora included fourteen species of soft corals perforated with conical non-lamelliferous pores. Several of these have been taken as types of new genera or subgenera, and, according to the general practice of modern zoology, the Linnaean genus is transformed into a great family. Lamarck (Animal. sans Vertébres, 11) places many of the Mil- lepores in his fourth section of Polyplya, the foraminated corals, with Catenipora and Tubipora, which belong to other groups. The Milleporidae form a distinct order in the Foraminifera Polyplya of Lamouroux (Expos. Method.), and include no less than eighteen genera, viz.:—

Oculites, Retepora, Lunulites, Orbulites, Ocellaria, Melobesia, Eudea, Alveolites, Theonea, Chrysaora, Millepora, Terebellaria, Spiripora, Idomea. (Distichopora, Hornera, Krusecarnes, and others are included among Milleporidae in the table, but not in the body of the work.) The genera in Italica are fossil.

Lamouroux defines the Milleporidae thus:—Polyplya stony, polymorphous, solid, internally compact; cells very small or polygonal, scattered or in series, never lamelliferous, though the parietes are sometimes lightly striated.

Blainville collects the Milleporidae into groups according to the form of the cells in the coral, and defines the family by characters drawn both from the animal and the stony support. Animals in general very slender, and provided with a single circle of slender tentacula; cells sometimes of considerable size, but always without lamelle or strie within or without the tubes; polyplya fixed, varying in shape. Retrenching from the group the palmated kinds (to form the genus Palmipora among the Madrepllythecœa), there remain, according to Blainville, 23 genera, and these are disposed:—


2. Cells round, very fine, poriform, immersed.—Orbiculites, Marginopora, Stromatopora, Tilia, Spinipora, Chry- saora, Cricopora, Distichopora, Heteropora.

3. Cells round or less tubular.—Distichopora, Hornera, Idomea, Cricopora.

The following are the principal characters of these genera:—

§ 1. Cells polygonal.

Favorites.—Animals unknown; cells prismatic, contiguous, vertical or diverging, the parietes pierced with pores, the cavity divided by transverse septa; polyplya branched or massive, sometimes basaltiform.

A genus of Lamarck; Goldfuss added to the knowledge of its structure, but changed its name to Calamospora. Blainville thinks Eunomia of Lamouroux may be included in it, but the descriptions are unlike. Ehrenberg places it near Astreus, in the family of Madrepllythis, and we think with reason.

The Favorites are only known in a fossil state, and, we believe, only in strata of the 'Transition' and carboniferous eras, in the former of which they are specially abundant, in the Eifel, Sicuria, at Dudley, &c.

Example. Favorites Gothlandicus. (Goldfuss, t. 26, f. 1.)
Lamouroux (following Tieleius) calls it Krusensterna. The species are recent in the seas of Kamichataka and the Mediterranean.

Example, Frondipora reticulata. (Blainv., pl. 69, f. 1.)

Lichennopora.—Animals unknown; cells rather large, poriform or subtubular, subpolygonal, accumulated and scattered on the interior surface of a fixed orbicular, cupuliform polyparium, which is quite smooth externally.

A genus of De fine, including one recent and three fossil species from the cretaceous and tertiary strata.

Example, Lichennopora turbinata. (Blainv., pl. 68, f. 4.)

Thecora.—Animals unknown; cells rather large and deep, subpolygonal, accumulated irregularly, prominent on the tumid or angulated face of the polyparium, which is fixed, irregularly lobed, and more or less lacunose between the accumulations of pores.

Example, Thecora clathrata (Lamouroux, pl. 80, f. 17), from the colite of Caen.

Apennaea.—Animals unknown; cells subpolygonal, small, poriform, irregularly disposed, occupying the upper and external edge of sinuous ridges, smooth on one side, plased on the other; polyparium globular or hemispherical, diverging from the base to the circumference.

A genus of Lamouroux, from the colite of Caen.

Example, A. dianthus. (Blainv., pl. 59, f. 2.)

Terbelliaria.—Animals unknown; cells small, oval, subpolygonal, quinquefurcated on the surface of the polyparium, which is composed of short conical apically twisted branches.

This beautiful coral, thus characterised, is found in the colite of Caen, and, it is believed, also abundantly near Bath. Perhaps only one species is known, which Lamouroux divides into two.

Example, Terbelliaria ramosissima. (Lamour, pl. 82, f. 1, a.)

Terebelliaria ramosissima.

Pelagia.—Animals unknown; cells subpolygonal, close, irregular, occupying the convex edge of numerous vertical ridges, disposed in a radiating form, and either simple or dichotomous, on the upper surface of the coral; polyparium free, fungiform, excavated and lamelliferous above, convex, pedunculated, and circularly wrinkled below.

Example, Pelagia olypsea. (Lamour, pl. 79, f. 5, 6, 7.)

From the colite of Caen.

Polyseta.—Animals unknown; cells poriform, polygonal, irregular, unequal, numerous, occupying the knotty branches of a small fixed polyparium.

A genus of Risso.

Polyseta caninaequum. (Blainv., pl. 69, f. 4.)

§ 2. Cells rounded, poriform.

Orbitolithes.—Animals unknown; polyparium a regular, orbicular, discoid, cellular, cretaceous mass; cells in two layers, sometimes apparent externally, and especially at the margin, which is thickened.

A genus of Lamarck, apparently founded upon an internal coral. One recent European species, and several fossils from the chalk and tertiaries of Europe, are mentioned.

Example, Orbitolithes complanata. (Blainv., pl. 72, fig. 2.)

Margaritina.—Animals unknown; cells poriform, excessively small, round, close, situated in the narrow tortuous folds of the circumference of the polyparium, which is free, irregular, discoid, thickened at the margin, and concentrically striated on both surfaces.

(Probably an internal coralline plate.)

Example, Marginopora vertebralis. (Blainv., pl. 69, f. 6.)

Stromatopora.—Animals unknown; polyparium hemispherical or subglobose, formed of alternately solid and porous adherent superposed layers.

The character is from Goldfuss, the author of the genus. The cells are very small, the external surface concentrically wrinkled. The species are fossil in the 'Transition' lime-

stone, &c. of the Eifel, Siluria, Dudley, &c. Mr. Lonsdale has described a new species similar to a Nummulite in figure.

Example, Stromatopora concentrica. (Goldfuss, 'Petri-

faca Europae,' tab. 8.)

Ceripora.—Animals unknown; cells poriform, round, close, irregularly distributed in concentric layers; polyparium polymorphous, often globular or lamellar.

This genus was established by Goldfuss, but is curtailed by a stricter definition, by Blainville, to suit fossils which appear in the chalk of Maastricht and the 'Transition' rocks of Bamberg.

Example, Ceripora microtopa. (Goldfuss, f. 10, f. 4.)

Chrysea.—Animals unknown; cells poriform, very fine, with a round opening, accumulated on the intervals of ridges, which anastomose on the surface of the fixed irregularly rameous polyparium.

A genus of Lamouroux, to which Blainville refers many of the Ceriporae of Goldfuss, which belong to the colite formations.

Example, Chrysea spinosa. (Lamour, pl. 81, f. 6.)

Tetisa.—Animals unknown; the polyparium formed of tortuous, verrucose, cylindrical branches; cells small, accumulated in irregular patches which project above the general surface, and are separated by smooth intervals.

Example, Tetiesa distorta. (Lamour, pl. 74, f. 5, 6.)

From the colite of Caen.

Spinopora.—Animals unknown; polyparium adherent by a concave concentrically striated face below; above reticulated, tuberculated, and bearing between the tubercles poriform cells.

Fossil from the chalk. Three species.

Example, Spinopora mitra. (Blainv., pl. 70, f. 3.)

Distichopora.—Animals unknown; cells of two kinds, some stelliform, scattered, superficial, shallow; the others poriform, deep, unequal, forming three lateral rows on each side of the branches of an aboriginaceous polyparium; these branches are compressed, obtuse, subulaceous, and tubulous within.
This Lamarkian genus contains the Millepora, violaces of Linnaeus. (Blainv., p. 55, f. 2.)

Heteropora.—Animals unknown; cells round, poriforous, completely immersed, of two sorts; some, larger than the others, are regularly dispersed on the whole surface of the polyparium, which is fixed, lobed, or branched, and formed of superfused laminae, second and third order, mostly secondary laminae, second order, of which the outer is the only one which is visible. The genus is Blainville's, formed to include certain Ceriopora of Goldfuss which have two sorts of pores. Example, Heteropora cryptopora. (Goldfuss, l. 10, f. 3.)

Fossil from the chalk of Maastricht.

Mr. Lonsdale mentions one from the Silurian Rocks. (Murchison's Silurian System, p. 890.)

§ 3. Cells round, and more or less tubular and prominent.

Pustulopora.—Animals unknown; cells rather prominent, pustulose or mammellated, distant, with round openings; polyparium formed of superfused laminae, cylindrical, digitiform, or a little branched, fixed.

The few fossils which have these characters are separated from the Ceriopora of Goldfuss by Blainville. They are from the chalk and colite.

Example, Pustulopora madreporensis. (Goldfuss, pl. 10, f. 12.)

Hornera.—Animals unknown; cells with a circular opening, prominent, detached, dispersed almost quincuncially on the inner face of the branches of a fragile ramulose polyparium, which is fistulose and furrowed on the non-polyerior face.

A genus of Lamouroux, formed from Retepora of Lamark. It includes several living species, from the seas of Europe and Australasia, on two-thirs, chiefly from the tertiary strata, but Mr. Lonsdale notices one from the Dudley limestone.

Example, Hornera frondiculata. (Lamour., l. 7, 4, l. 7, 8, 9.)

Hornera frondiculata. a, natural size; b, c, fragments of the upper and lower sides, magnified.

Idomea.—Animals unknown; cells prominent, subconical, distinct, with a circular opening, arranged in half rings or short cross-lines, on two-thirds of the circumference of the branches of the polyparium, which is not porous, but slightly channelled on the non-cellularulous face; the branches are divergent and triquetral.

One living species belongs to this genus of Lamouroux, and several fossils from the oolite of Caen, and chalk and tertiary of Maastricht and Paris. Goldfuss has included two of them among Retepora.

Example, Idomea triqueta. (Lamour., pl. 79.) From the oolite of Caen.

Cricotopora.—Animals unknown; cells tubular, rather prominent, with a circular opening, arranged in rings transversely or obliquely on the surface of a fragile polyparium, which branches into cylindrical parts obtuse at the extremity.

This genus was named Spiraropora by Lamouroux, but it is only rarely that the cells take anything approaching to a spiral arrangement. The coral is alake through its mass. Some of the most characteristic species are fossils from Caen. C. Faujasis is from the chalk of Maastricht, and Blainville joins to the group two recent species, Seriostopora annulata and S. nuda (Lamarch). Ehrenberg calls the genuine one, and Wiegmann Trunculata.

MILLER, SIR THOMAS. Second son of Mr. William Miller, writer to the signet, was admitted advocate at the Scotch bar in February, 1749, in the twenty-fifth year of his age. In 1748 he was constuted steward (or sheriff) of Kirkcudbright, and the same year was elected joint principal clerk of the city of Glasgow. These offices he resigned in 1755, being then appointed solicitor to the excise in Scotland. In March, 1759, he was made king's solicitor-general: in April of next year, he was advanced to be lord advocate, soon after which he was returned to parliament. In November, 1762, he was chosen rector of Glasgow college. He continued in the post of lord advocate till April, 1766, when he was raised to the bench of the court of session, and succeeded Sir Gilbert Elliot, lord justice clerk, deceased; on which occasion he took his seat, by desire of the court, on the right hand of the lord president; and thence, on Dunda's death, he was, in January, 1768, elevated to the presidency of the court of Session, being the first lord justice clerk so promoted. The following month he was created a baronet. He died 7th September, 1789, leaving the present Sir William Miller, a judge in the court of session by the titular designation of Lord Glenlee, and other children.

It is to be distinguished from the poet Burns alludes to these lines of his "Vision:"—'

"Through many a wild romantic grove,
Near many a hermit-fenced cave,
I am happy for friendship or love,
In loving mood,
An aged judge I saw him—
Dispassionate good."

MILLER, JOHN MARTIN, born at Ulm (where his father was preacher in the cathedral and professor of Oriental languages), December 2, 1756, was a novelist, whose productions have made a great name in the last century. At Göttingen, where he went to study theology, in 1776, he became acquainted with Voss, Holtz, Bürger, the two Stuflers, and other eminent literary characters of the time, and afterwards with Klopstock, whom he accompanied on his return to Hamburg. After taking orders, he was appointed preacher at the cathedral of his native town in 1783, and in 1797 professor of theology at the Gymnasium. In 1810 the king of Württemberg bestowed the dignity of Ulm on him; but he did not enjoy it many years, for he died on the 21st June, 1814.

Although now almost forgotten, his romance of "Sigwart" (first published in 2 vols., 1776, shortly afterwards greatly enlarged, and in many parts rewritten) had sufficient success. It called forth a host of imitations, and had also the distinction of being parodied. It was translated into French, Polish, Dutch, Danish, and Italian. Like his "Sigwart," his "Karl von Burghiem" and other novels have little action or interest of story, but are distinguished by pure morality and an amiable and exaggerated sensibility. This excess of sensibility and sentiment, which however was merely caricatured by his professed imitators, qualified him well for an elegiac and lyric poet; and his productions of that class are distinguished by the tenderness and religious feeling which they breathe. His sermons are likewise compositions of no ordinary merit, attractive in style, eloquent, and impressive.

In his personal character he is said to have been rather cold and formalistic, and therefore unsuspected to find in the author of "Sigwart" an impassioned enthusiast. His romances may be forgotten, but his poems never can.

MILLES, JEREMIAH, dean of Exeter, was the son of Jeremiah Milles, and nephew to Dr. Thomas Milles, bishop of Waterford and Lismore. Bishop Milles left his fortune to his nephew Jeremiah, who was born in 1714, and educated at Exeter. He afterwards went to Corpus Christi College, Oxford, where he took the degree of M.A. in 1735, and that of D.D. in 1747. He married a lady from a family of high rank, and had a son. In 1747, he was admitted prebend in the cathedral of Waterford, and presented to a living near that city, which he held but a short time, choosing to reside in England. Upon his return he was married, and had a daughter, the daughter of archbishop Potter, through whose means he obtained the united rectories of St. Edmund

MILLES, JEREMIAH, DEAN OF EXETER, was the son of Jeremiah Milles, and nephew to Dr. Thomas Milles, bishop of Waterford and Lismore. Bishop Milles left his fortune to his nephew Jeremiah, who was born in 1714, and educated at Exeter. He afterwards went to Corpus Christi College, Oxford, where he took the degree of M.A. in 1735, and that of D.D. in 1747. He married a lady from a family of high rank, and had a son. In 1747, he was admitted prebend in the cathedral of Waterford, and presented to a living near that city, which he held but a short time, choosing to reside in England. Upon his return he was married, and had a daughter.
the King and St. Nicholas Acon, in Lombard Street, with that of Merstham, in Surrey, and the secure rectory of West Tozingto. 10. Dr. More's was nominated to the deanery of Exeter, on the advancement of Dr. Charles Lytton to the see of Carlisle, whom he also succeeded as president of the Society of Antiquaries in 1769. In the 'Archaeology' are many fine specimens of the first, and some copies by him; particularly one entitled 'Observations on the Wardrobe Account of the Year 1483, wherein are contained the Deliveries made for the Coronation of King Richard the Third, and some other Particulars relating to that Monarch,' and another ('A Discourse on Certain Marbles') which joined the abbé Barthélemy in denying the genuineness of the Apeamneal medal. Mr. Gough informs us that, while dean of Exeter, he formed a large collection of materials for the 'History of Devonshire.' This most unsuccessful literary attempt, in order to vindicate the authenticity of Rows's Certes in a stratification in which he printed, in 14to, in 1782. The dean died February 13, 1784. (Nichols's *Literary Anecdotes,* vol. iv., pp. 471, 472; Chalmers's *Biogr. Dict.,* vol. xxii., pp. 166, 169.)

With the north, between the deep limestone dales of Yorkshire, the millstone-grit rocks appear on the summit of Ingleborough, Penyghent, and Whernside, mixed with shales, limestones, ironstones, and beds of coal. At least three distinct bands of conglomerate are here marked off in the hill, and a similar character belongs to the series in Durham and Northumberland. Through all the extreme north of England indeed the millstone-grit group passes by its coal, ironstone, &c. to the coal forma-

The rock from which the group is named, the millstone-grit, is a very coarse-grained quartzose sandstone, with layers of the pebbles, often of considerable size. They require a climate warmer and drier than that of England to ripen properly. Millstone is cultivated largely in the southern parts of Europe—in Spain, Italy, the south of France, Switzerland, and Southern Germany; but it is grown most extensively in France—in Normandy, Artois, Anjou, and Nubia. It has also been introduced into the West Indies, where it is called Guinea corn, and is used as food for the negroes. In the East millstone is used as food for men; but in Europe, though it is sometimes made into loaves and cakes, and frequently into puddings, it is mostly used for feeding poultry and domestic animals. The leaves and panicles are given, both green and dried, as fodder to cattle.

Millstone has been described by botanists under the generic term *Holcus.* The most common Indian millstone (*Holcus Sordum,* Linn.), known in Nubia by the name of *Durra,* is described under *Sorghum vulgare.* We briefly notice the most important of the other species.

Black millstone (*Holcus nigricans,* Arduinio) is one of the largest species. *Caffre millstone* (*Holcus Caffer,* Arduinio) is a native of the Cape of Good Hope. Yellow-seeded millstone (*Holcus saccatarus,* Linn.) is a native of the East Indies. Two-coloured millstone (*Holcus bicolor,* Linn.) is said to be a native of Persia. Drooping millstone (*Sorghum cernuum*) is cultivated in Arabia, Syria, and various parts of the Levant.

MILLIN, AUDIN LOUIS, born in 1758, was an eminent French antiquary, who succeeded Barthélemy as keeper of the antiquities and museum in the Palais Royal. His *Dictionnaire des Beaux Arts,* *Dictionnaire de la Fable,* *Monumens Antiques,* and *Galerie Mythologie,* are all useful contributions towards archeology and the fine arts. Besides these works, his *Magasin Encyclopédique,* which appeared in twelve volumes without securing any profit from it, was a highly valuable literary journal, and may now be regarded as a repository containing much important information. To the above may be added his *Voyage dans les Départements du Midi de la France,* *Voyage dans la Savoie,* and *Voyage dans la Savoie.* These works possess a permanent interest on account of the historical and antiquarian matter which they contain. He died August 14th, 1818.

MILLION. [NUMERATION.]

Million is the title of a remarkable group of *Milliones*, which belong to the carboniferous system and separate the coal formation from the mountain limestone. It may be regarded as one of the many instances of transition on a large scale, which reveal to the geologist local changes of level and position of the land, and vary the present series of pebbles, sand, and clay, with land-plants, over surfaces where, previously, corals and shells were accumulated in the sea. The character of this group varies according to a certain law of development, in passing from the south of France to the north of England and Ireland. It is most marked in the south-west of England, South Wales, or any of the midland coal-fields, but in Derbyshire it acquires great thickness, and appears in some of the most striking scenes of that romantic county. Here it is a series of thick arenaceous rocks, alternating with shales and flagstones below the coal and above the limestone. Perhaps no more remarkable feature in English geology can be noticed than the bold erags of millstone-grit which are crossed as the traveller proceeds from the coal of Sheffield to the limestone of Castleton; and as the north, between the deep limestone dales of Yorkshire, the millstone-grit rocks appear on the summit of Ingleborough, Penyghent, and Whernside, mixed with shales, limestones, ironstones, and beds of coal. At least three distinct bands of conglomerate are here marked off in the hill, and a similar character belongs to the series in Durham and Northumberland. Through all the extreme north of England indeed the millstone-grit group passes by its coal, ironstone, &c. to the coal forma-

MILNER, JOSEPH, was born in the neighbourhood of Leeds, on the 1st of January, 1744. He was sent to the grammar-school at Leeds, where, by his industry and talents, among which a memory of most extraordinary power was conspicuous, he gained the warm regard of his instructor, the Rev. Mr. Moore, who recommended him to have him sent to college. This plan was nearly frustrated by the death of Milner's father in very narrow circumstances; but by the assistance of some gentlemen in Leeds, whose children Milner had lately engaged in teaching, and by the offer of the office of chapel-clerk at Catherine Hall, Cam-

He now became assistant in the school, and afterwards the tutor of the Rev. Dr. Cottrell, near Tadcaster. Here he proceeded in the composition of an epic poem, entitled 'Davidis,' which he had commenced at Cambridge, and which he afterwards finished at Hull. It was submitted to Dr. (afterwards Archbishop) Cottrell, who highly approved of the author on the talent it displayed, but advised him to defer its publication. Not long after he had obtained deacon's orders, Milner was elected head-master of the grammar-school, and afterwards lecturer of the prince's chapel at Hull. The school increased under his care. He not only introduced his younger brother to those literary pursuits in which he was afterwards distinguished [Milner, ISAAC], but also took him mother and two orphan children of his elder brother to live with him. About the year 1770 he embraced the order of the
evangelical party in the church of England. This change in his religious views brought upon him neglect, and in some cases open opposition from many among the upper classes of the community. His friends and patrons withdrew from his church, which was soon crowded with others, chiefly from the lower orders of the people, in whose sentiments and manners his preaching produced a striking change; and at length he not only recovered the esteem of his fellow-townsmen, but lived and died under the sentiments previously spoken of in the town that many of the pulpits of the churches were filled by his friends and pupils, and he himself was chosen vicar of Hull by the mayor and corporation. His election took place on Wednesday before Christmas, 1789, and his installation in the church on the following day. His death happened on the 15th of November, 1797, in the 54th year of his age. For seventeen years before his death he had been vicar of North Ferriby, near Hull. A monument, executed by Bacon, was erected to his memory in the high church of Hull by several gentlemen who had been his pupils.

The excellencies of Mr. Milner's personal character were of the highest order. He was deeply pious, upright in all his conduct, singularly open and sincere, and kind, cheerful, and amusing in social life. In his political principles he stood strongly attached to the established order of things in church and state.

The work by which he is best known is the 'History of the Church of Christ,' which was commenced by himself and completed by his brother, the late Isaac Milner. It was also written in opposition to the rise of Christianity to the Reformation. The first edition of this work appeared in 5 vols. 8vo., 1794 to 1812, and a second edition in 1816. It has been more than once reprinted. The plan of the history, as well as the execution, gives strong indication of stating that in all ages of the church there have existed 'men who have been real, not merely nominal Christians,' he proceeds,—'it is the history of these men which I propose to write. It is of no consequence with respect to my plan to explain the several points of union and opposition, or to state what external church they belonged. I intend not to enter with any nicety into an account of their rites and ceremonies, or forms of church-government, much less into their secular history. Even religious controversies serve to explain the views of those who differ from me, but they are foreign to the essence of Christ's religion, and of which the history of his real church requires some account. Let not the reader expect that the actions of great men (great in a secular view, I mean) will be exhibited to his notice. Nothing less than that of the order to belong to Christ's kingdom shall be admitted: genuine piety is the only thing which I intend to celebrate. It is manifest that on this plan no complete church history can be written. Such a work would require the collection of facts, the relations of dates which have at any time prevailed among any of those who profess the Christian faith; leaving the reader to conclude, from these materials, which parties have been right and which wrong. But on Milner's plan we have avoided the difficulty of the class of opposition and those who differ, this class is determined solely by their agreement with the sentiments of the author. Now, to say nothing of the temptation to do violence to facts, to which an author is exposed who is determined to trace the existence of certain principles in all ages of the church (a temptation from which it is but just to add that Milner has escaped), it is clear that, writing on this plan, two ecclesiastical historians of opposite creeds would produce works containing very different circumstances, but each professed to be a history of the Church of Christ.' Though, for these reasons, Milner's work cannot be called a complete church history, its value as a contribution to church history is very great. It is written in that spirit of piety, and of deep interest in what has no author but the writer of the work, which is not always found in our celebrated church historians; and for the very reasons which prevent its being complete, it contains many important facts which had previously been little attended to. It surpasses most other church histories in the simple, yet full, statement of the proceedings of the church, and the reverence which the author professes for those venerable men has led him to trust them too much.

The other works of Mr. Milner are,—1, 'Gibbon's account of Christianity considered; together with some Strictures on Hume's 'History.' 2, 'First Preparatory Sermons on the》，1st and 2nd, 'A Letter to a Friend in the University.' 3, 'Some Passages in the Life of William Howard.' 4, 'Essays on the Influence of the Holy Spirit.' 4, 'Tracts and Essays, Theological and Historical.' 5, 'Practical Sermons; with an Account of his Life, by the Dean of Carlisle,' 2 vols. A complete collection of his works was edited by the dean of Carlisle.

MILNER, ISAAC, dean of Carlisle, and brother of the preceding, was born in 1751. At the age of six he began to accompany his brother to the grammar-school at Leeds; but at his father's death his studies were interrupted, and he was engaged learning the woolen manufacture. When Joseph Milner was appointed head master of the grammar-school at Hull, he released his brother from his engagements at Leeds, and took him under his own tuition, employing him as his assistant in teaching the younger scholars. In this capacity Mr. Milner expresses his sense of this act of kindness with an affectionate warmth which shows the attachment that existed between the brothers, and is equally creditable to the feelings of both. In 1770 Isaac Milner entered Queen's College, Cambridge, where he took his degree of B.A. in 1773, and was Senior Wrangler. In 1775 he was elected fellow of Queen's College, and in 1783 Jacksonian Professor of Experimental Philosophy; in 1788 he took his degree of D. and was elected, master of Queen's College; and in 1788 he was appointed Lucasian Professor of Mathematics. In 1791 he was appointed dean of Carlisle. He was twice Vice-Chancellor, in 1792 and 1809. At Cambridge he formed a close friendship with the late Mr. Wilberforce, by whom he was engaged to fill his place on the board of the University, when those eminent men were made to a tour on the Continent about the year 1879. He died at the house of Mr. Wilberforce, at Kensington Gore, on the 1st of April, 1829.

Dean Milner was possessed of very extensive and accurate learning. His religious and political principles agreed pretty closely with his brother's. He wrote the following works, besides several scientific papers in the Philosophical Transactions:—'A Collection of Sacred Songs;' 'A Letter to a Friend in the University.' 2, 'Essays on the Church History;' 'Anti-Adventures on Dr. Hume's History of the Church of Christ;' 'Discourses on some of the Publications of the Rev. Herbert Marlow, inculcating a Peaceable Policy, some of his Objections against the Bible Society.' The fame which he gained yearly increased to the end of his life;—Sermons,' 2 vols.; 'Essay on Human Liberty.' (Memor of Dean Milner,) in the Christian Observer for May, 1820, vol. xix., p. 289.)

Milo, Milo, is the name of the larger Cyclades in the Aegean sea, about 70 miles north of the coast of Crete, and 65 east of the coast of the Peloponnese. It is 14 miles long from east to west, and its breadth is about eight miles. Its northern coast is indented by a deep bay, which forms a natural harbor for vessels. The surface of the island is mountainous, and of volcanic formation; it has hot mineral springs, and mines of sulphur and alum. The soil is fertile, and produces abundance of fruit, wine, oil, and pasture for cattle. The population, which was 25,000 at the close of the last century, has greatly decreased; it is now stated vaguely at 7000 by Bali, and at only 1500 by Thiersch, but this latest estimate appears too low.

Besides the chief town, called also Milo, which is in the east part of the island, near the port, there are several villages, called Pollone, San Dimitri, Castro, &c. The lower grounds near the sea are marshy, and are said to render the air unwholesome in summer.

Melos, Melos, was a 'a colonised first by the Phoenicians, and afterwards by the Lacedaemonians. During the Peloponnesian war the Athenians sent an armament to reduce it under the command of Nicias, the son of Niceratus, but the attempt failed. Some years later in the war a new expedition was sent from the same cause with the same success. The siege of several months took the town of Melos, when the Athenians put to death all the adult males, and carried away the women and children as slaves, after which a colony of Athenians was sent to occupy the place. (Thucyd., iii. 91; Plut., Ciao, &c.) At a later period Melos, like the other Greek islands, became subject to Rome, and afterwards to the Byzantine emperors, the Venetians, and the Turks. It now forms part of the new kingdom of Greece.

There are extensive remains of the ancient capital of the island, Melos, the agora, the theatre, a small amphitheatre, cyclopean walls, a temple of Venus, and numerous subterranean galleries. A fine statue of Venus, found at Melos, is in the museum of the Louvre at Paris.
A number of vases and other antiquities have been discovered among the ruins.

The north-east extremity of Milos is the rocky island of Chios, called by the Italian sailors Argentiera; the channel between the two is very dangerous in stormy weather, and noted for shipwrecks. (Dapper, Description des Isles de l'Archipel; Forcachii, Tournefort.)

MILITAEDES (Ματιαίδης) was the younger son of Cimon (who was sprung from a noble Athenian family), and nephew of the elder Miltiades, who, during the life of Pisistratus, had founded a tyranny, or arbitrary government, in the Chersonese. The elder Miltiades had been succeeded by Sisagoras, the eldest son of Cimon, on whose death the young Miltiades succeeded to his place. The first important affair in which Miltiades appears is at that juncture, during the Sicyonian War, in 459, when the Greek commanders who guarded the coast over the Dardanelles debated whether they should not cut off the Persian king's retreat by breaking up the passage. Miltiades advised the destruction of the bridge, and although his opinion was overruled by his fellow commanders, yet the passage of the bridge was then and subsequently often shut against the Persians without the admittance of any troops. He advised his countrymen to pass the narrow strait with fifty ships, and then retire, and charge the Persians on the wing. This plan was adopted, and the Persians were defeated.

Twenty years afterwards, Miltiades was called upon to act a more important part. Hipparchus, one of the sons of Pisistratus, had fallen by the hands of Harmodius and Aristogiton; and Hippias, the other son, who had been driven from Athens by the revelation of the Spartans, had retired, as Greeks both than and subsequently often did under similar circumstances, to the Persian court. In Ionia, the burning of Sardis was followed by a war which lasted for six years, in which each party seemed to have learned a lesson: the Persians, that their enemy was not altogether despicable; and the Greeks, that unity of plan there was no hope of success.

In B.C. 492, Mardonius led the first Persian armament, which was stopped by the double wing of the Spartans. In B.C. 490, a second armament under Datis and Artaphernes was sent against Greece. This force crossed to Naxos, and thence to Delos and Euboea. A few days sufficed to sweep through the island of Euboea, and the whole of the coast was in a state of confusion. Pericles, who knew the capabilities of every spot of ground in his country, the army landed at Marathon. [Marathon.]

The plain of Marathon extends inwards from the sea to the mountains, where it is cut into a narrow glen by the spur of two hills, but spreads out along the base of these spurs and between them and the sea. It is roughly in the form of a T, the top stroke representing that part which borders on the sea, and the leg of the letter corresponding to the glen, which is divided lengthwise by a mountain stretching from the sea by the eastern side of the hill the Athenian army posted itself.

According to custom, the army was under the direction of ten generals, each of whom took the command for one day. Miltiades had been accustomed to the honours of his country, and the real merits of his conduct. He had a powerful ally in the polemarch Callimachus, who, by virtue of his office, commanded the right wing, and had just been acquitted on a charge of tyranny, more perhaps owing to the policy in which he had used his power in the Chersonesus, than to the real merits of his conduct. He had a powerful ally in the polemarch Callimachus, who, by virtue of his office, commanded the right wing, and had just been acquitted on a charge of tyranny, more perhaps owing to the policy in which he had used his power in the Chersonesus, than to the real merits of his conduct. He had a powerful ally in the polemarch Callimachus, who, by virtue of his office, commanded the right wing, and had just been acquitted on a charge of tyranny, more perhaps owing to the policy in which he had used his power in the Chersonesus, than to the real merits of his conduct. He had a powerful ally in the polemarch Callimachus, who, by virtue of his office, commanded the right wing, and had just been acquitted on a charge of tyranny, more perhaps owing to the policy in which he had used his power in the Chersonesus, than to the real merits of his conduct. He had a powerful ally in the polemarch Callimachus, who, by virtue of his office, commanded the right wing, and had just been acquitted on a charge of tyranny, more perhaps owing to the policy in which he had used his power in the Chersonesus, than to the real merits of his conduct. He had a powerful ally in the polemarch Callimachus, who, by virtue of his office, commanded the right wing, and had just been acquitted on a charge of tyranny, more perhaps owing to the policy in which he had used his power in the Chersonesus, than to the real merits of his conduct. He had a powerful ally in the polemarch Callimachus, who, by virtue of his office, commanded the right wing, and had just been acquitted on a charge of tyranny, more perhaps owing to the policy in which he had used his power in the Chersonesus, than to the real merits of his conduct. He had a powerful ally in the polemarch Callimachus, who, by virtue of his office, commanded the right wing, and had just been acquitted on a charge of tyranny, more perhaps owing to the policy in which he had used his power in the Chersonesus, than to the real merits of his conduct. He had a powerful ally in the polemarch Callimachus, who, by virtue of his office, commanded the right wing, and had just been acquitted on a charge of tyranny, more perhaps owing to the policy in which he had used his power in the Chersonesus, than to the real merits of his conduct. He had a powerful ally in the polemarch Callimachus, who, by virtue of his office, commanded the right wing, and had just been acquitted on a charge of tyranny, more perhaps owing to the policy in which he had used his power in the Chersonesus, than to the real merits of his conduct. He had a powerful ally in the polemarch Callimachus, who, by virtue of his office, commanded the right wing, and had just been acquitted on a charge of tyranny, more perhaps owing to the policy in which he had used his power in the Chersonesus, than to the real merits of his conduct. He had a powerful ally in the polemarch Callimachus, who, by virtue of his office, commanded the right wing, and had just been acquitted on a charge of tyranny, more perhaps owing to the policy in which he had used his power in the Chersonesus, than to the real merits of his conduct. He had a powerful ally in the polemarch Callimachus, who, by virtue of his office, commanded the right wing, and had just been acquitted on a charge of tyranny, more perhaps owing to the policy in which he had used his power in the Chersonesus, than to the real merits of his conduct.

At the University he was distinguished for the peculiar {227}
excellence of his Latin verse, and, according to his own expression, met with 'more than ordinary favour and respect' during the seven years of his stay there. It will be unnecessary here to go into the momentous question whether Milton was whipped at Cambridge. Dr. Johnson is ashamed to relate what he fears is true, that Milton was one of the last students in that university that suffered the public indignity of corporal correction, and Warton, in an elaborate commentary on Milton's first elegy, draws from the words a meaning which would have startled the author: but there appears small reason to believe the fact.  

Milton and his brother both, as Milnes points out, were given a classical education. Milton was sent to his father's house at Horton in Buckinghamshire, where, during a residence of five years, he read over all the Greek and Latin classics, and, as it is supposed, wrote his 'Aresides Comus,' 'L'Allegro,' 'Il Penseroso,' and other poems. It appears that attempts have been made to fix the precise place where some of Milton's minor poems were written, by a reference to the descriptions of scenery contained in them. It appears to us that these attempts depend on a mistaken principle; that, namely, of assuming the poet's mind to have been influenced in such matters by the scenery with which he is at the time familiar. Now that localities must affect a person who is writing descriptive poetry, no one will deny: but in purely imaginative poetry, like 'L'Allegro' or 'Il Penseroso,' with any great weight to such considerations, particularly when the descriptions are so general, and when the describer is Milton.  

In 1637, on the death of his father, Milton travelled into Italy, during which journey he was introduced to Grotius and Tasso. Milton's residence in Italy was brief. While the Italian news reached him of the progress of the troubles in England. Releasing his original intention of prolonging his journey to Sicily and Greece, he returned, after an absence of fifteen months, and devoted himself to the study of the divinity of the Old Testament, and to the politics of the day. Much has been said on his system: Dr. Johnson has sneered at him; and more modern authorities have attacked it in order to support a contending theory, each perhaps without reflecting much on his system. The evidence of his system was not to supply the then existing deficiency of instruction in the knowledge of nature, or to substitute some other treatise on such matters for the works of Aristotle, but to exchange, as quietly as possible, and at the same time as decidedly, the hitherto formal routine of classical teaching for one in which the books that were read might arouse thought as well as exercise memory. His list comprises almost all the technical treatises of the age in Latin and Greek, but excludes history and almost all the scientific works on natural subjects, probably because he only intended it for children, and postponed such subjects for the instruction or amusement of riper years. His aims were not those of a mathematician or the philosopher of nature, nor, science was in his view, and his object was to make the best of the numbers of a university, but well informed citizens. To this tend his economy of manly exercises and his plans for a common table, which could have had little importance in the eyes of a student.  

In 1641 Milton began his political career by writing a treatise 'Of Reformation,' which was followed in the same year by those on 'Prelatical Episcopacy,' 'The Reason of Church Government urged against Presbytery,' and some animadversions on a tract of Bishop Hall's, and in the next by 'An Apology for Smock-Makins.'  

In 1643 he married his first wife, who was the daughter of a country gentleman of Oxfordshire. Not long afterwards his conjugal troubles began, by the refusal of his wife to return to him from a visit to her father. He accordingly removed her a few miles away, and in 1643 published four treatises in justification of his conduct. The former year is also remarkable as that in which he produced his 'Tractate on Education,' and that most able of all appeals, the 'Defence of the Contagious Speech for the Liberty of Uninstructed Printing,' a work which contains the main space remarks on passages of surpassing eloquence than which any other which proceeded from his own or from any other pen.  

About this time Milton was reconciled to his wife, whose friends had last students in either university that suffered the public indignity of corporal correction, and Warton, in an elaborate commentary on Milton's first elegy, draws from the words a meaning which would have startled the author: but there appears small reason to believe the fact.  

Milton's next work, 'The History of England,' was interrupted by his appointment to the post of Latin secretary to the Council of State, which had determined that the Latin language was to be taught in all foreign institutions, a custom which has not been dispensed with until lately as far as treaties are concerned. At present, treaties are written in French, in addition to the languages of the parties to it; and disputes on the text are settled by an exchange of embassies. At this version, Milton could not have chosen any man in England better qualified for the office by his sound scholarship and his ready command of the Latin language; but it is to be regretted that in his controversies he has made no attempt to criticise style instead of weighing arguments. In his new appointment Milton was deputed to answer 'Eikon Basilikè,' which he did in 'Eikonoklastè;' and soon after to rebut Salmassius's vindication of monarchy, by his 'Defensio Populi Anglicani.'  

The duties of his office, occasional pamphlets on politics, and his 'History of England,' which appeared in 1670, employed him till he began 'Paradise Lost.' At the Restoration he retired into obscurity; but he seems to have incurred no particular danger, although he was once in close attendance at the king's court. Some sacrifice his safety to Sir W. Davenant.  

Having obtained indemnity under an act passed in 1666, he married his third wife, Elizabeth Minshull; and in 1665, according to Elwood the Quaker (who acted in the capital role in his secretary), he had produced 'Paradise Lost,' which was shown to Elwood in a finished state in that year, during a visit paid by Milton to some friends of Elwood's in Buckinghamshire. The poem was licensed and published in 1667. Five pounds were paid by Samuel Samuelson, the bookseller, for the copyright, with a promise of five pounds more when 1300 copies should have been sold, of the first, second, and third editions respectively. The 'Paradise Lost' first consisted of only ten books, but the direction of Elwood led to the addition of two more. The second edition was published in 1674, three years before which time he had produced 'Paradise Regained' and 'Samson Agonistes.'  

In 1673 he published a 'Summary of Logic;' in 1674 a treatise 'Of True Religion,' &c.; and in 1674 his Latin verses in praise of John III. He died on Sunday, November 8, 1674, and was buried in the chancel of St. Giles, Cripplegate. For full information on Milton's life, his habits, appearance, &c., the reader is referred to the copiously learned biographies by Todd, prefixed to his edition of Milton's Poetical Works.  

Milton belonged to the Independents, a name in his time expressive both of religious and of political tenets. He seems to have been as bold in speech as in writing, and the story of the dinner given to his son, a youth of thirteen, by his friends some unaccusness for his safety. But Milton did not consider, as some have supposed, that in entering on controversy he was following the bent of his nature: he calls it expressly a manner of writing, wherein knowing myself inferior to many, and led by the desire of another task, I have the use, as I may account it, of my left hand.' After the death of Charles he took a decided part against the Presbyterians, as is shown by his tract on 'The Tenure of Kings, and became the champion of republicanism against Salmassius. This was the period of his greatest celebrity. As Latin secretary he held an official residence for eight years, and divided the curiosity of foreigners with Cromwell himself. Yet, at the Restoration, he had no hardships to complain of, except the exorbitant fees charged by the serjeant-at-arms, and it is even said that he had the refusal of his original office.
It would be out of place here to do more than notice in a cursory manner the special qualities of Milton's poetry. To attempt by writing to impress the beauty of Milton's imaginative work upon those acquainted with that work is a task more easy than useful; for those who do not appreciate poetic beauty without the guidance of another man's judgment were seldom imbued with the spirit of transcendentalism, and in like manner those who are not by their own taste directed to see the faultiness of a critique like that to which we have referred, will probably derive little benefit from being told that it has faults. But there is another class of people who are so regular in their tastes that it may be well to direct a few observations; those, we mean, whose taste is accurate enough to enable them to trace faultiness as pervading the system, though they cannot discern its particular mistakes.

In any criticism, on whatever subject, it is most important that the spirit in which the work subjected to criticism was written, should be kept in view by the critic. With this restriction and condition an imaginative work like 'Lycidas,' written in the style of a school of Greek poets, of which Theocritus is the model, would never be called 'easy, vulgar, and therefore disgusting'; it may be well to direct a few observations; those, we mean, whose taste is accurate enough to enable them to trace faultiness as pervading the system, though they cannot discern its particular mistakes.

"History of England" into a metrical shape, and then criticizing it as a poem, is sufficiently manifest; but when we come to an imaginative work like 'II Penseroso,' dissect it into elements, and make those elements purely narrative, persons are and have been deceived into supposing this dissection to be legitimate criticism.

"Paradise Lost," perhaps the greatest continuous effort of human imagination, had originally the form of a drama, of which several plans remain. The epic form however at last received this change, and the drama remains in the present poem to enable us to trace with some distinctness the shape which it probably assumed. In spite of all that has been said and written on "Paradise Lost," the truth of Dr. Johnson's observation must be to a considerable extent allowed, that it and one of the indices which the reader admires and lays down, and forgets to take up again.

Much of this inattention is no doubt owing to the character of this age. Learnt to write by rote, and therefore not less to speak, either in the way of dispassionate description, like Byron's; imitations of antiquity so disguised that we are not all of us able to trace them, like Walter Scott's; or thoughtful poetry, either couched in sensuous imagery, like that of Shelley, or aspiring to the great romantic fragment, like "Life of England." But for allusions to classical authors, however beautiful, for an exhibition and exposition of the leading doctrines of Christianity, couched in language however sublime, and for a history of events so gigantic, we have no taste when conveyed in the form of a poem. In other words, "Paradise Lost" is not and cannot be extensively popular; and even among its admirers we shall detect many who judge of it not as a poetical but as a theological production. Taken as a whole, a proper estimate cannot be formed of it by any one who has not the advantage of that partial view which facilitates the learning of the author; and the same may be said of the dramatic works of Milton, for the allusions to passages in the Greek tragedies which are contained in the first few pages of 'Samson Agonistes' are almost equal in number to the sum total of those in 'Judas Maccabaeus.'

Milton's poetry cannot be dismissed without a word or two on his versification. His matchless ear led him to choose blank verse — a measure till then almost unknown except in dramatic works as the best medium of poetic beauty being the harmony of his lyrical verses, in which, as in everything else, he seems to have been a century in advance of his own time. If we compare his liquid verses with the liltting jingle which characterizes almost all the songs of the last century that attempted the octave stanza, the difference will be immediately discerned. It was not until Milton began to supersede the French school that English poets produced verses approaching his own in sweetness. Such are some of Coleridge's and Shelley's, not to mention Scott, who borrowed his measures from other sources.

Of all authors ancient and modern, respecting whom conflicting judgments have been pronounced, no one has had more to contend with, both from the unwise conduct of his friends and the malice of his enemies, than Milton. Alling at a time when party spirit ran high, and identifying himself with one of the exiled men, his character has been assailed by many enemies, and of his defenders not a few have made up by violence what they wanted in discretion. It is part of our national habits to regard every man who is not of the opposite party, not according to his eminence in art or science, so much as according to his political position.

This is no theory, but a positive fact, which fact has become more generally true during the last half century from the accident of that literature by which the opinions of a great portion of the reading public is guided — the periodical literature — having assumed a tone distinctly political. Thus Milton is often viewed, not as a poet, not as a writer of all writers most eloquent, but as a partisan. And yet, until we divest ourselves of this deep-engraved prejudice, we shall never understand Milton's prose works as they ought to be read; we shall never see in them the commentaries on his own poetry which they supply; we never trace those models of eloquence which they contain; never reflect that in Milton's polemics we find the perfection of a remonstrator's style, the acuteness of Bentley, and with qualities more adapted to controversy than any which have been exhibited from his time until the beginning of the present century; that in his historical poetry, Milton was written not less poetically than Niebuhr's 'Lays' and 'Legends of Roman History, although Niebuhr was the first who followed, however unconsciously, this great example; and that in his 'Speech for the Liberty of Unlicensed Printing' the sentiments are noble, and are more nobly expressed than in any English composition before the days of Burke. It is as rhetorical models that we must view Milton's prose works: his logic may fail, his facts and arguments may be insufficient, but his eloquence remains unrivalled.

The curious and capricious reaction which has come over Milton's life-time in regard to public taste. The Shaksperian drama, that wonderful combination of active and reflective poetry, gave place to a bad imitation of an unnatural model, the French heroic play. Italian measures, those which Surrey, Shakspeare, and Milton had all most nobly expressed and more nobly expressed than in any English composition before the days of Burke. It is as rhetorical models that we must view Milton's prose works: his logic may fail, his facts and arguments may be insufficient, but his eloquence remains unrivalled.

The editions of Milton's poetical works are very numerous. His prose works have been much neglected, and we are not aware of any which including the tract on Christian Doctrine has yet appeared.

In the year 1823 a Latin manuscript, with the title 'De Doctrina Christiana, libri duo posthumis,' was discovered in the State-Paper Office, and, from internal and other evidence, was attributed to Milton, and to be known to have written on this subject, and which was supposed to be lost. It was edited by the present bishop of Winchester (Summer), and a translation was also published. The subject of the work is the different religious opinions prevailing in the different nations, and the freedom of opinion which pervade all Milton's writings. As a theological work, it is perhaps almost unnecessary to remark that it would be considered of little value by any denomination of Christians.


MILVUS. [FALCONIERE, VOL. VIII, P. 167.]

MIME (from the Greek mimēs, an imitator), a dramatic performance of irregular form among the Greeks, in which occurrences of real life were clothed in a poetical
dress. It usually consisted of a single scene, mostly central, sometimes with such dialogue added as the excitement of the moment prompted. Mimes appear to have been common entertainments at feast... Sometimes they were acted on the stage. Sophron of Syracuse (born about A.D. 420), who wrote in the vulgar dialect of the Doric Greek of Sicily, is considered the inventor of this species of composition. His mimes were in rhythmic prose, and were highly esteemed by Athenian aesthetes as new, and served to adorn the taste for this species of composition. With the exception of a few fragments, and the names of some of the works of Sophron are lost. The fragments of Sophron are collected in the 'Museum Criticum,' No. VII. We have some fragments of the famous satirical work of Theophrastus, Philistion of Nicaea, another writer of mimes, was contemporary with the latter years of Socrates. Suidas (Frabolos) calls his mimes biologik, or 'pictures of life.'

Among the Romans, mimes seem to have been nothing but irregular burlesques, probably the lineal ancestors of our 'Punch.' In the time of Augustus, Bathyllus and Pyldae divided the taste of the Roman capital as actors of mimi. Among the mimographers of Rome we find Mattius, Labe- nius, and Potosarius the Syran, the second of whom died A.D. 49. He composed those pieces of the height of his popularity. Labe- nius acted as well as composed mimes. In the reigns of the earlier emperors we meet with other mimographers of celebrity, but none came up to the reputation of Labeinus and Potosarius. (Macrobius, Sat. ii. 7; Suetonius, Cæs., c. 39; Ziegler, De Mimanis Romanorum, Gottinga, 1789, quoted in 'Conversations Lexikon.')

MIMNERMUS OF COLOPHON, a Greek elegist and poet, flourished c. 5th century B.C., and is one of the chief names in Greek lyric poetry. His works are said to have consisted of 150 pieces, but none of which can be traced in the writings of others. His best work is 'Theatres,' a collection of his works, which is still extant. He was a pupil of Pindar, and is said to have been the first to use the elegiac verse, which was afterwards adopted by the Roman poets.

MIMUSEA are a division of the Leguminous order of plants, whose flowers are regular, the stamens long, usually indefinite in number, and hypogynous, and the flowers valerate in maturation. They are in many cases polymorphic, and their leaves are always more or less compound. The principal genus of the division is the Acacia. [ACACIA.] Mimosa itself consists of a considerable number of species, many of which are remarkable for the irritability of their leaves, which are slender and pointed, which is a common object of interest. [SENSITIVE PLANTS.] The species commonly cultivated for the exhibition of this phenomenon is the Mimosa pudica, a South American annual. Among the most useful is the Mimosa plaenicarpa, and not included in the genus Acacia, and is Inga, a tree from South America, and some others, whose pods contain a sweet nutritious fucula, which renders them fit for food; and several kinds of Prosopis, the stragony of whose pods and bark renders them of considerable value for purposes. In general, in the tropical parts of the world, they are found in all parts of the world, and in the southern hemisphere they extend beyond such limits, as in Van Diemen's Land, where Acacias, called Wattle, are the common tree.

MINANGKABOU. [SUMatra.]

MINAREK (from the Arabic menarah, a lantern), in Turkish and Eastern architecture, a very slender and lofty turret, having one or more projecting balconies around it, that divide it externally into two or three stories. They are used in Mohammedan countries for the purpose of calling the people to prayers, and therefore serve the purpose of belfries. They are however generally more numerous than such purpose actually demands, there being one at each angle of the building, and sometimes a greater number. The material of a minaret is chiefly brick, stone, and iron, and the form is frequently, as well as on account of their frequency, that of a tall, column-like shape, which causes them to contrast so picturesquely with the domes that crown the edifice, and together with which they serve to produce a pleasing and dignified effect. The minaret is one of the most characteristic forms of the Oriental style, and is to be found throughout the Islamic world.

MINAS GERAES. [Brazil.]

MINGCIO. [Po.]

MINDANAO. [Philippines.]

MINDEN, one of the three governments into which the Prussian province of Westphalia is divided, is composed of the ancient principalities of Minden, Paderborn, and Corvey, of the county of Ravensberg, the hill-town of Reckenberg, and the lordships of Rheda and Krettenberg. The county contains 2,000 square miles, and the population 357,976. It is subdivided into 10 districts: there were formerly 13 districts, but some have been incorporated with others. The soil is of unequal quality. There are some barren spots, but the greater part is fertile in corn, beans, and flax. The country is well supplied with water, and the trade on its banks is very considerable. That part of this government which formed the principality was formerly a bishopric, which was secularised at the peace of Westphalia, and assigned to the electorate of Brandenburg.

MINDE. [It.] A town of Saxony, near Zittau, on the River Elbe, and on the trade on its banks is very considerable. That part of this government which formed the principality was formerly a bishopric, which was secularised at the peace of Westphalia, and assigned to the electorate of Brandenburg.

MINDE, in Saxony, is the capital of the district of Minden, a town of Saxony, on the river Elbe, and on the trade on its banks is very considerable. That part of this government which formed the principality was formerly a bishopric, which was secularised at the peace of Westphalia, and assigned to the electorate of Brandenburg.

MINIAC, a bishopric in France. The name is of Latin origin, and is derived from 'miniatus,' meaning 'diminutive,' and is applied to the town because it is a small town.

MINIÇCO. [Po.]

MINODA. [Philippines.]

MINO, a town of Crete, on the east coast, and on the trade on its banks is very considerable. That part of this government which formed the principality was formerly a bishopric, which was secularised at the peace of Westphalia, and assigned to the electorate of Brandenburg.

MINOA, a town of Crete, on the east coast, and on the trade on its banks is very considerable. That part of this government which formed the principality was formerly a bishopric, which was secularised at the peace of Westphalia, and assigned to the electorate of Brandenburg.

MINOVA. [It.]

MINOA. [Philippines.]

MINOCA. [It.]
MINORO [PHILIPPINE ISLANDS].

MINE, a system of subterranean works or excavations formed in or going down upon any mineral or metalliferous deposits, are obtained by digging and extracting such portions of them as may be of sufficient value. These excavations are arranged in such a manner as to facilitate the drainage and ventilation of the works, to render them easily accessible to the miners, and to economise the application of labour in the extraction of the metallic ores or other mineral produce. In addition to the underground works which constitute the mine, properly so called, the term usually comprehends also the ground at the surface, together with the numerous appendages which are necessary to the working of the mine. This machinery for drainage, the extraction of the ores and their mechanical preparation, with various buildings and erections. The various works which constitute a mine, and their construction and arrangement, are fully described in the general treatises on the subject.

Miners are usually worked by companies, who hold grants or leases of the property from the mineral proprietors, for a certain term of years, commonly twenty-one. The risk and responsibility of the expenditure, of the materials in the work, is thrown on the company, by whom the capital is provided and the management conducted, the proprietor of the mineral receiving a stipulated portion of the gross returns of the mine as a consideration for the use and deterioration of his property. This is a system which, though it promises to increase the value of the produce, is not confined to the north of England, where the mines are comparatively shallow and cheaply worked, it is commonly an eighth or a tenth; but in Cornwall, where the mines are deep and expensive, it seldom exceeds a fifteenth, an eighteenth, or a twentieth of the capital and management outlay.

Although this payment, which is denominated 'dues' or 'royalty,' from the circumstance of all miners having originally been the property of the king, is of course a matter of right, and claimed as such whether the mine is worked by the crown or by a mining company, it is, in some degree, as well as liberal policy to greatly reduce or even omit it for a time, during periods of temporary poverty or distress, as a company may thus be encouraged to make further trials, to try and consequently prospect for high mines, to be allotted to both parties. Considered as property, there are exceedingly varied and fluctuating, some making very large profits, others barely paying their expenses, while upon many there is a heavy loss. Of the capital required to open mines in this country, no general average can be given: in some cases not more than 40,000l. or 50,000l. have been expended; in others, the sum has amounted to 150,000l. In the older and best established undertakings, the number of shares is small, as 64, 100, or 128. In some recent companies, however, it has been subdivided into several thousands; but most of these have been unsuccessful. Of the profit of mines no general estimate can be given. In some cases it little more than repays the capital expended; in others it amounts to two or three hundred thousand pounds after paying back this capital. The duration of mines is very uncertain: some are now working which are known to have been opened centuries ago, but these have been abandoned time after time in consequence of poverty or difficulties arising from imperfect machinery, or have been worked, and afterwards abandoned and afforested. Full scope for enterprise. It may probably be stated that mines of the soft metals, as copper, tin, and lead, rarely continue in a uniformly productive state for more than fifteen or twenty years together, although diggings of one or more periods of ore may produce their existence greatly beyond this period. Coal and iron mines, on the contrary, remain permanent in their produce, and may continue to be worked for an indefinite period of years.

Great Britain is the most generally mining country. With the exception of quicksilver and the precious metals, it contains every variety of mineral in great abundance, and has been estimated to produce annually a greater amount of mineral wealth than all the other countries of Europe together. Rich and extensive mines of copper and tin are worked in Cornwall and Devonshire; and in Wales and the north of England there are some very productive lead-mines. There are rich mines of copper in Ireland and lead-mines are worked both in that country and in Scotland. The most productive mines of coal and iron in the world are opened in South Wales, in Staffordshire, and in Scotland, while mines of coal are also found in the counties of Lincoln, Cumberland, Yorkshire, Durham, Northumberland, and many parts of Scotland and Ireland. Beds of rock-salt are extensively worked in Cheshire, and large quantities of porcelain clay are obtained near Littlecote in Wiltshire, and near Tiverton in Devonshire. Beds of coal are worked extensively in the coal-field of Lancashire and Yorkshire, and of large extent in the north of Scotland. Iron-springs are worked in Worcestershire. The depth which mines have attained in the various parts of the country is considerable, amounting in many cases to from 200 to 300 fathoms.

The quantity of water drawn from them is far greater than in any other part of the world, and the machinery employed is of the most powerful and perfect description. The extent and produce of the English mines, the large capital employed in them, and the boldness, the skill, and ability with which their management is conducted, are the admiration of foreign engineers, who make frequent visits to this country from abroad.

Mineral coal, which may be considered as the most valuable of the various classes of coal produce, is found in several parts of England, and in the United States of America. It is used in the manufacture of iron, in the production of charcoal, and in the production of gas, and is an important source of coal-cellar and coal-tar products. There are large and extensive deposits of coal in the United States of America, and it is estimated that the coal-field of the United States contains about 100,000,000 tons of coal. The coal of the United States is of good quality, and is used extensively in the manufacture of iron, in the production of charcoal, and in the production of gas. It is also used extensively in the manufacture of coke, and in the production of coal-tar products. The coal of the United States is of good quality, and is used extensively in the manufacture of iron, in the production of charcoal, and in the production of gas. It is also used extensively in the manufacture of coke, and in the production of coal-tar products.
Mineralogy then must be considered as including the chemical composition of bodies, and an account of their external or physical properties. Both are requisite, for substances, unless they are known in their chemical composition, and exhibit differences in their external characters; while there are other bodies which differ in their chemical constitution, but agree in their external properties.

Various methods of arranging minerals have been adopted by different authors, which we shall not minutely describe or discuss, as the alphabetical arrangement which has been adopted in this work precluding any other here. We may however observe that, according to one method, six divisions are made in the four classes of earthly minerals, saline minerals, inflammables, and metals: Karsten classed them under the heads of earths, salts, combustibles, and metals; Haüy divided minerals into acidulous earthy substances, earthy substances, non-metallic combustible bodies, metallic bodies, substances not sufficiently known to admit of classification, rocks, and volcanic products. In Phillips's "Elements of Mineralogy," the classes are earthly minerals, alkaine-earthly minerals, acids, acidulous earthy minerals, acidulous alkaline minerals, native metals, metaliferous minerals, and combustible minerals. Berzelius has attempted a strictly chemical classification of minerals: he has however candidly admitted that considerable difficulties attend this method, owing, in the first place, to the uncertainty which exists as to the exact nature of the elements, and, secondly, to the want of sufficient evidence as to the presence of a certain element in a mineral. The arrangement of Berzelius has however, with some slight modifications, been adopted by Mr. Brooke in the work to which we have already alluded.

We shall assume that mineralogy includes a knowledge of the chemical composition and of the external and physical properties of minerals, and they are all divisible into two great classes of crystallized and uncryrstallized. With respect to regularly crystallized minerals we refer for an account of them to what is called Minerals and Technology. There are some substances which do not assume regular forms, but have an imperfect crystalline structure; while those bodies which are neither crystallized or crystalline, unless they are pulverulent, are described as amorphous and morpophous, or without any particular form.

The structure of bodies is also an important character in some cases, and it may be compact, granular, fibrous, foliated, earthy, sealy, or laminar, and it is applicable both to crystallized and massive minerals.

Protrusion is a very distinguishing characteristic in many cases, and the commonest is the variety, in which the minerals are uneven, coarse, fine-grained, splintery, hackly, and irregular.

Hardeness.—In this respect minerals differ greatly.

Specific Gravity.—In this respect also minerals are very different, for: for the modes of ascertaining it, see Specific Gravity.

Colour.—Minerals occur not only of every colour, but of every mixture of colours, and also colourless. Colour can scarcely be admitted as a very distinctive character, for there are some minerals which exhibit all colours: of this quartz is an example; for it is met with colourless, black, grey, brown, red, yellow, green, blue, purple, slightly bluish, pale grey, and slightly greyish.

Minerals sometimes resembles that of the mineral itself, but is often extremely different, so that it is impossible to foretell what it is likely to be. Hence the importance of the character. Sometimes the streak is merely shining, and its colour does not differ from that of the mineral.

Transparency, &c.—Minerals exhibit every degree of transparency, from the most perfect to absolute opacity. The different degrees are expressed by transparent, semi-transparent, translucent, transparent on the edges, opaque; it is observed that some transparent bodies are doubly refractive, as calcareous spar, &c.

Lustre.—Minerals are described as having vitreous lustre (that is possessed by the greater number of them), resinous lustre, metallic lustre, adamantine lustre, pearly lustre, and glassy lustre. Under perfect lustre, with a perfectly devoid of lustre, the mineral is described as dull.

Phosphorescence is the property which some minerals possess of becoming luminous when heated; this is particularly the case with apatite and fluor spar.

Electricity.—There are certain minerals which become electric either by friction or by heat: this is the case with the tourmaline, diamond, &c.

Magnetism.—There are certain oxides of iron, some of which are natural magnets or lodestones, and others which may be converted into magnets by their becoming heated to a high degree. These minerals contain the iron oxide, and as they contain this metal or the oxide, possess either the power of attracting as a magnet, or of being attracted by the magnet.

Besides the above more general and distinctive characters, we shall call certain minerals which are marked by peculiar causes of attraction, and by which they are distinguished from other minerals, as the pitchblende, the bitumen, the turpentine, the asphaltum, and the asphaltic earths. These minerals are sometimes described; thus mica is flexible and elastic, while talc is flexible but not elastic. The touch, smell, taste, and adsorption of minerals to the tongue, are in some (but comparatively few) cases mentioned by mineralogists.

Without submitting the mineral, to a regular analysis, advantage is often taken of the effects of heat by means of the blowpipe, with or without the aid of certain fluxes, as soda, phosphoric salt, &c.; and the mineral is stated to be either fusible alone, or with the assistance of the different fluxes, and the nature of the resulting compound is described; sometimes it is a colourless glass, at other times coloured, transparent, or opaque, &c.

MINEVRAYA, or MINEYRVA, an ancient Italian divinity, known also by the name of Minerva. Her attributes corresponded in most respects to those of the Greek goddess. She was the patroness of arts and industry, such as spinning, weaving, &c., and was the goddess of all the mental powers. Her statue was usually placed in the temple in which the pupils of a school, or the pupils were present in a master's with a present called Mineral. (Varro, De Re Rust., iii. 2; compare Tertull., De Idol., c. 10)

Minerva also presided over olive grounds (Varro, De Re Rust., i. 1); and goats were not sacrificed to her, according to Varro, because they are not at all pernicious to the olive. (Ovid, Fast., vi. 621.) There were several temples in Rome sacred to Minerva. Over most of one on the Caelian Hill, in which she was worshipped under the name of Minerva Capta, but the origin of the name is unknown. (Plut., i. 833-839.) It also appears from some of the ancient grammarians that this goddess was thought to preside over the healing art.

The etymology of the name of Minerva is doubtful. The first part probably contains the same root min, men, or men, that we have in the Latin me-mi, men, &c., the Greek nom-emos, &c., and the Hebrew menah, and in the Latin Nat. Deor., iii. 24) gives a very curious etymology, 'Minerva, quia minuit aut qua minuet,' but some of the ancient grammarians appear to have been nearer the truth in considering it a shortened form of Memerina, since her was the goddess of memory, and she connected it with the vermur. Müller (Etr., ii. 48) supposes that the words of Ettrian or Sabine origin.

MINES, MILITARY, are excavations made in the rampart of a fortress, or underground, in order to contain gunpowder, which, being exploded, the breach, or any works of the enemy, above or near the mine, may be destroyed.

The term offensive is applied to the mines which are formed to deliver a charge of gunpowder, while those which are formed by the garrison are called defensive mines, or fortifications. The cavity in which the powder is deposited is called the chamber; and the approach to the latter is called the gallery. (GALLERY.)

The two main roads of mines were annually employed in the attack of fortresses. One of them was merely a subterraneous passage carried under the walls from the exterior ground; or being suddenly opened within the town, the assaulting were enabled to enter the latter by surprise. The other kind was the more useful for the besiegers, who by the breach of the wall caused the destruction of the battlements and towers of the place in ruins; for this purpose, the galler having been driven as far as the walls, was carried on the right and left under the latter, which were supported...
props of timber till the time appointed for the assault was come; then, the props being drawn away or consumed by fire, a portion of the rampart fell into the ditch; and the troops, who were kept in readiness, passed over the ruins into the town. Mines of this kind are described in a relation of the siege of the castle of Boves near Amiens, at which siege Philip Augustus attended in person. At the siege of Meaux, which was carried on by Henry V., king of France, and the Duke of Burgundy, 2420 pounds of gunpowder was delivered by the besiegers having driven their mine almost up to the walls, and the besieged having executed a mine in opposition, a barrier was erected where the two galleries met, and the assault was made and fought with lances against two Dauphinines.

As the parties engaged two abreast, it is evident that the galleries must have been much broader than such are made at present. The old French writers occasionally applied the term mines to what were also then, and are now, called trenches. Thus, at the siege of Harfleur, in 1449, mention is made of broad and deep trenches by which the approach to the wall is said to have been rendered secure; and the same works are immediately afterwards called mines.

Gunpowder was, n 1467, used in military mining by the Genoese at the siege of Serezanella, a town belonging to the Florentines; but on this occasion without success. It is stated however, in the life of Goncalvo de Cordova, that Francis I. charged the charges must be made, for the formation of gunpowder at the siege of Cephalonia, near the end of the fifteenth century, when the Venetians and Spaniards took the island from the Turks. And in 1503 the same engineer, or, according to Vallière, an Italian called Francis Crispium, in digging the mine of the Castle del'Ovo at Naples. This fortress was situated on a rock nearly surrounded by the sea, and had during three years resisted the united arms of the Spaniards and Neapolitans. From that time the practice of forming mines with gunpowder has been almost regularly followed in the attack and defence of fortresses. By means of 1173 mines, great and small, the Venetians defended Candia during more than two years (1666 to 1669) against the whole power of the Turks. The Italians sent into its works and defended during 63 days by the Austrians against the Prussians. In the course of this last siege two of the mines fired by the besiegers had charges of powder amounting to 5000 pounds each; and the depth of the charges below the surface of the ground was from 18 to 20 feet.

In the siege of any place the mining operations of the besiegers are directed to the discovery and destruction of the galleries of countermines; to the blowing up of any advanced works belonging to the garrison; to the demolition of the entrances of the ramparts, in order to get into the ditches may be facilitated; and occasionally, to the formation of breaches in the principal ramparts. On the other hand, the countermines are employed by the defenders to destroy the trenches and breaches of the besiegers beyond the foot of and upon the glacis; and also the lodgments which may be made on the breaches or within the works. It is easy to perceive therefore, that a system of countermines must add greatly to the strength of a place, by obliging the besieger to proceed with circumspection in his approaches aboveground, in order to avoid the risk of being blown up at every step; and, according to Bossard ("Essai général de Fortification"), if the glacis of a fortress be countermined, the duration of the siege, which on an average has been prolonged to one month only, may be prolonged to six weeks.

The chamber in which the powder is placed is a cubical excavation formed on one side of the gallery, very little larger than is necessary to enable it to reach the box wall, and when it is destined, the vertical face of the chamber is covered with boards, which are kept in their places by short timbers fixed in horizontal positions between them and the opposite side of the gallery. The powder which was found to be in excess of the length of the gallery greater than that of what is called the line of least resistance, that is, a line imagined to be drawn from the chamber perpendicular to the surface of the ground above. The mass of earth thus filling the tamping of the mine. A train of powder in a cloth hose, forming a tube about three-quarters of an inch in diameter, and for security contained in a wooden trough called an auger, or a casing-tube, is laid from the box in the chamber through the tamping, to the place where the fire is to be applied; and its extremity is attached a piece of port-fire, as it is called, which, being lighted, the fire communicates by means of the train with the powder in the chamber, and an explosion takes place.

The dimensions of the crater or funnel formed by the explosion depend on the amount of the charge; its form may be considered as an irregular frustum of a cone, or paraboloid, and the mine is denominated one-lined, two-lined, etc., according to the number of the craters at the surface of the ground is equal to one, twice, etc., the length of the line of least resistance. Every explosion of this kind necessarily produces a compression of the earth in all directions about the crater to a certain extent; and the mines formed with high charges have been designated globes of compression from this circumstance. A line drawn from the chamber to the circumference of the crater, on the ground, is considered as the radius of the globe of compression, or the distance from the chamber to which the lateral effect of the mine will extend. The last-mentioned kind of mine is used by the besiegers only, as it consumes more powder than the defenders can generally spare; its object is, by compressing the earth laterally to a considerable extent, to destroy a side wall of an enemy's gallery or blow down the counterscarp of a ditch.

The rules for determining the charges of mines are founded on the results of experiment, and it is evident that such calculations would be impossible without comparison with the proposed figure of the mine, that is, with the ratio between the diameter of the crater and the length of the line of least resistance. When a mine of the kind called two-lined is formed in common earth, the amount of the charge is taken as equal to one-tenth of the cube of the line of least resistance in feet; but for a three-lined and a four-lined mine it is supposed that the cube of this line should be multiplied by 21 and by 45 respectively. In an experiment made at Tours, when a four-lined mine was formed in a sandy soil by the Prussian Major Le Febvre, the cube of the line of least resistance in feet was very nearly equal to the charge in pounds. According to the latest experiments of the French engineers, the necessary charge of gunpowder to remove one cubic yard (English) of material is as follows:

<table>
<thead>
<tr>
<th>Material</th>
<th>Charge (Pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common earth</td>
<td>121</td>
</tr>
<tr>
<td>Strong sand</td>
<td>164</td>
</tr>
<tr>
<td>Potter's clay</td>
<td>175</td>
</tr>
<tr>
<td>Loose sand</td>
<td>225</td>
</tr>
<tr>
<td>Old masonry</td>
<td>294</td>
</tr>
<tr>
<td>Freestone</td>
<td>214</td>
</tr>
</tbody>
</table>

Now the figure of the crater being supposed to be a paraboloid, of which the centre of the chamber is the focus—if a be the length of the line of least resistance in yards, and r a the radius of the crater at the surface of the ground, also if m = 3-1416, we shall have

\[
a = \frac{m r^2}{4 (1 + \sqrt{m^2 + 1})}
\]

for the volume of the crater in cubic yards; therefore, multiplying this volume by the numbers in the above table, we should have the charge in pounds.

In order to determine the proper size of the chamber, or rather of the box, which is to contain the powder, it will be necessary to observe that one pound of gunpowder occupies, in volume, about 30 to 35 cubic inches.

Experience has shown that the greater the charge of powder, the greater is the quantity of earth removed by the explosion. But this fact has its limits; for when the charge is considerable, since the whole of the powder does not take fire instantaneously, it will happen that the earth is partially displaced before the inflammation is completed; so that fissures being formed in the ground, the force of the powder is spent in the air without producing any effect. Hence it may be concluded that there is a certain mass of earth of effect; and a limit is imposed by Belidor that, in earth of mean density, the greatest craters will have their diameters, at the surface of the ground, equal to about six times the length of the line of least resistance.

MINGRELLIA. [Georgia.]

MINHO. River. [Portugal.]

MINIATURE, a species of painting which, owing to its mode of execution being adapted only to a very small subject, and more particularly portraits, has acquired such a distinct

Vol. XV.—2 H
MINING. — A regular or detailed history of mining, however interesting in itself, would far exceed the limits of this article; we shall therefore briefly glance over the main facts of the subject, since they have been led to their present bold and extensive operations for the extraction of metals and other mineral substances. The use of the metals, and consequently some process for their extraction and separation, may be traced to the most remote antiquity and is already lost in the obscurity of the early history of our species. Moses ascribes the first use and manufacture of the metals to Tubal-Cain, the seventh in descent from Adam, who is said to have been the 'inventor of the art of smelting iron, and of brass and iron; and a notice we are not entitled to build much, but it proves nevertheless that the use of the metals is almost coeval with the human race. Procopius likewise states that it was known to the earliest nations of antiquity, as the Greeks and Egyptians. Gold and silver were among the early antinomies; an alloy of copper and tin formed the armour and weapons of the Greeks, although iron was not unknown among them, and of this metal the Roman weapons were formed. These facts do not, however, imply any great knowledge of mining, properly so called, as it is well known that metallic deposits are often found near the surface, frequently in a state of extreme purity, as gold and copper for example; and in early ages, when they had been so much less remanned by the miner, these superficial deposits must have been much more abundant. The Romans, however, probably furnished a large portion of the metallic produce of those times. Most of the mines of antiquity were probably of a similar nature to the stream-works of Cornwall, and it is evident that the use of arras was very ancient. This art is that early time used to trade to Cornwall for tin and lead. In early times the demand for the metals could not have been very great; these were then either as instruments of luxury or war, and thus confined to a limited class, so that the value of the metal and the surface was in all probability fully adequate, leaving but little inducement for deeper and more laborious research.

There is, however, evidence enough to show that operations similar to those of modern mining were carried on by the Greeks, Romans, and other nations of antiquity. Herodotus relates that Porus, king of Bactria, who was the king of the mountain in the island of Thasos, was completely buried by the Phoenicians in their search for the precious metals; and the curious fragment of Agatharchides preserved in Diodorus (b. lib. xii. 19) shows that the art of forming shafts and galleries for exploring mines was well known in Egypt. The silver-mines of Laurium a Attica were worked by the Athenians, to some extent at least, as early as the beginning of the fourth century B.C. Under Philip the Macedonian the quicksilver workings of Almadin in Spain (Marius) were extensively worked.

It is singular to observe that an art for which this country possesses such great natural facilities, and which was certainly cultivated here both before the Roman conquest and during the Middle Ages, and the occupation of which towards have fallen into decay, and indeed for a time have been chiefly practised by foreigners. Prior to the Norman conquest our mines had been much neglected, probably in consequence of incessant civil commotions; and subsequently to this period they were chiefly worked by Jews. In the reign of Elizabeth the art of mining had fallen into such decay that an importation of foreign skill was found necessary to revive them; and the Germans, Hung and justly celebrated as skillful miners, received every encouragement. The discovery of large veins of silver, and apparently similar extensive deposits, has since been made to them. From this measure some success appears to have resulted, and in the following reign we find Sir Hugh Middleton, a citizen of London, deeply concerned in the lead silver mines of Cardiganshire, from which a large revenue, which was some years ago, has been annually derived from the metropolis still benefit the formation of the New River. About this time a new and important sanitary was furnished to the art of mining by the application of the pumping-engine. Before the revolutionised the art of war thus became the means of effecting an equally extensive change in one of the most prominent arts of peace. Of the early use of gunpowder in mining, and more especially in this country, we have probably the most accurate account; the following particulars have been given by Mr. John Taylor in a history of mining in Rees's Cyclopaedia: — The application of gunpowder to...
the purposes of mining first took place in Hungary or Germany, about the year 1620, and it was first introduced into England at the copper-mine at Ecton in Staffordshire, about the year 1626, by some German miners brought over by Prince Rupert. It was in use in Somersetshire about 1645, and it was not till after this period probably that the Cornish miners became acquainted with this powerful assistant to their operations. Its importance may be judged of by the amount of the present consumption in the mines of Cornwall alone, which has been calculated at an annual value of about forty thousand pounds sterling.

In the latter part of the last century another important event took place in the history of English mining. The rich deposits of copper which have long constituted the principal mineral wealth of Cornwall, had up to this time been confined by the fact of being confined with “muscovite” and worthless iron pyrites, common in most mines, and partly from its lying deeper in the veins than the ores of tin, which had always formed the chief object of search. When at length the nature and value of the copper have been fully realized, a powerful stimulus was given to this new branch of mining, which has been carried on to the present time with great and increasing activity, the copper-mines of that county being now the deepest, the most extensive, and most productive in the world. The copper has not only in Cornwall become of more importance, but it has also been found that during the last century exercised such vast influence upon our arts and manufactures, was early rendered applicable to mining in this country, and in a great degree contributed to the present perfect state of the art. Savery, who was the first of the copper-miners in this country, was the first to make the Mussel of Worcester to that honour, was the first person who constructed a practically useful engine worked by steam, sought in the first instance the patronage of persons interested in mines, as we see by his publication entitled "the wise and pastoral," and hence the application to this new power was at once obvious. The introduction of Savery's engine into our mining districts probably led to the great improvements effected by Newcomen, a resident in Devonshire, which vastly increased its efficiency, and indeed completely altered its principle. Their joined patent was taken out in 1705, and from that date the steam (or rather, atmospheric) engine became a most useful auxiliary in the hands of the miner, and was very generally employed for draining purposes, and was known under the name of "Newcomen's engine." The introduction of this engine, therefore, of the coal used in that county being brought from South Wales. It is chiefly to the object of economy that the efforts of late engineers have been directed, and so successfully, that their improvements have fully kept pace with the increased depth of our mines, many of the most productive of which would have long since been abandoned had not this been the case. These great improvements have chiefly originated in Cornwall, where ingenuity has been manifested, which has been in the same degree as the numerous individuals who have contributed to them, the names of Woolf, Trevithick, and Grose may be particularly mentioned.

The improvements in the manufacture of iron which have taken place in this country, whilst they vastly increased the demand for it, and thus gave a great stimulus to the working of this metal, and of coal also for its reduction, contributed much to the perfection of mining generally, by enabling the miner to employ iron pumps instead of wooden siphons, although in some districts, although in some, for example the higher strata of the Wrexham coal, they have not permitted a better construction and arrangement of the pit-work, one of the most important apparatus employed in mining, and hence greater depths have been attainable than might otherwise have been the case. Among many mining experiments which have been tried, one of them may be mentioned the laying down of iron tram-roads underground in mines, as well as their use upon the surface, the carriage of the mineral to different parts of the works has thus been greatly facilitated and economized.

Simultaneously with the improved machinery and apparatus introduced to attend the close of the last century, great improvements also took place in the interior, economy of mines and the arrangements of the underground works. The ancient mode of following down the ore by irregular isolated excavations, and of stopping the bottoms of the mines in the German manner, gave place to the system of laying open the ground for discovery and extraction, by a well-arranged series of shafts, levels, and winzes. By this plan the ore or mineral is divided into more convenient masses for extraction, and can be worked much more economically by the former mode of stopping or cutting away the ground in the bottom of the levels, as still practised on the Continent.

The most recent improvements which have been introduced into mining are those which regard the mechanical treatment of the ores after they have been extracted from the mine, and previous to their being fit for the furnace. The processes used for this purpose are technically termed "washing" and "dressing," by means of which the ore is freed from many of its earthy inclusions, and thus rendered much richer for metal, in an economical point of view. In effecting this object, several kinds of apparatus are employed, chiefly the stamping-mill, the crushing-mill, and the jigging-machine, the use of which has been known from time immemorial; they are perhaps as old as the human race, and it has also become far more general, to the great benefit of all mines, especially those in which a large proportion of the poorer ores are obtained. The competition with foreign mines, in which labour can be obtained more cheaply than in this country, has made it necessary to make more improvements, which, though less striking than some others, have, within the last few years, been productive of extremely beneficial effects, and may still be considered as in progress.

The history of coal-mining is in great measure distinct from that branch of the science which bears the title of engineering, and which chiefly relates to the extraction of the metals. The introduction of gunpowder, the invention of the steam-engine, and the improved manufacture of iron, have formed the principal improvements upon which we have bestowed our patronage. These have greatly contributed to the present extended scale upon which our coal-mines are worked. The great objects which improvement has within the present century been directed are the ventilation of the works and the invention of apparatus for removing the fire-damp, and the adoption of some more or less effective preservative against explosion. Many attempts have been made of late to improve the safety-lamp, but none of the improved lamps have been generally adopted; and it is highly probable that in most cases of explosion, where Mr. Humphry Davy's lamp has been used, the explosion has been the direct result of the carelessness of the men rather than from any defect in the contrivance itself.

One of the most important events in the history of mining in this country is only at the present moment beginning to develop itself, the establishment of suitable means of instruction for the mining engineer. This desideratum was first supplied by the university of Durham, which opened a class for instruction in civil and mining engineering, in January, 1836. In the latter part of the same year a similar department was opened in King's College, London; and a similar institution has just commenced its operations at Truro, in Cornwall, having been organised under the auspices of Sir Charles Leman, who has at length supplied what has been long felt to be a want in that great mining county. The local position of the Durham University and of the Truro Institution is highly favourable to the joint acquisition of theoretical and practical instruction; an advantage in which King's College cannot compete. It is also intended to give a preliminary instruction to the mining engineer. These institutions can hardly fail, in time, to produce an important effect on the mining industry of this country.

Mineral Deposits. In proceeding to treat of the practice of mining, some preliminary details will be useful; for as mining operations are of course in great measure regulated by the nature of the mineral or metalliferous deposits to which they are directed, and by which are determined the form and construction of the mine, and much of the internal...
that the metals are very rarely presented to us in a pure or metallic state, although native masses of copper and iron are occasionally met with; but gold, from its small affinity for oxygen and other mineralizing substances, although frequently alloyed, is never mineralized. The great bulk of the metals to which, with the exception of gold, we are generally confined, are found in the state of ores, that is, chemically combined with certain mineralizing substances, which completely disguise, and, in fact, till separated by metallurgical processes, destroy their usually recognised and useful properties. The most important of these metals are, the copper, lead, and mercury, which are usually combined with sulphur, which forms the following sulphures, iron pyrites, galena, and cinnabar; we observe the latter in all cases where the metals are mineralized by acids, as in copper, iron, or carbonate of iron, in which the iron of the compound, the oxide of iron, is united to another, the carbonic acid. From this naturally compound state, in which the metals almost invariably occur, arises the art of metallurgy, which, although generally considered totally distinct from mining, is nevertheless most intimately connected with it.

**Earthly Impurities.**—Independently however of those chemical combinations from which the metals can only be freed by the smelter when treated in the furnace, there are impurities which in many cases forbid their separation from the metals, and require to be partially separated on the mine, and which therefore fall entirely within the province of the miner. Although large masses of the metallic ores, as before observed, are found on the surface in the form of veins or deposits, confined to particular portions of the vein, there is also a considerable portion of the ore in all mines, which is more or less intermixed with the veinstone, or often indeed finely disseminated through it; and as the expense of fusing this large mass of earthy matter is very extensive, some of the ore is occasionally removed with the iron, and this with great advantage. When this separation has been properly accomplished, the metallic residue, before worthless, can be profitably smelted, to the great benefit of all, more especially the poorer class of miners, while those in which the precious metals are only partially dependent for their existence upon the skill and care with which it is performed. The mechanical impurities here spoken of are often sufficiently obvious even in hand specimens of the metallic ores, which, unless particular care is taken, the richest parts of the vein, will often exhibit thin alternate layers of metal and earthy matter, sometimes irregular masses of ore of different sizes which are completely intermixed with and imbedded in sparry and stony matter, and this must be considered the character of the metal. Although very frequently met with, it is not so rare as is frequently supposed, and in mining operations, it is equally necessary to be considered, as it was the use of the mirror that led to the discovery of copper. A proper perception of this fact, which is scarcely noticed in works on metallurgy, is most essential to a right understanding of the art of mining, and of the various operations necessary in the extraction and separation of the metals. A general principle, that in the construction of a mine, or the arrangement of the underground works, must depend in great measure upon the nature of the mineral deposit to be wrought, if we refer to the great division of mineral deposits into veins and beds, before noticed, and that the mode and extent of the separation is directly connected with the business of the miner. It must be well known.
of the least definite processes adapted to the working of irregular mineral masses and fragmentary deposits. Thus in working a mineral vein, as in a copper or tin mine, the excavations will be formed either vertically or in a highly inclined position, and pursued laterally, or, as the miner terms it, 'upon the course of the vein,' while the advanced points tend progressively downwards, or 'in depth.' In working a mineral bed, on the contrary, taking a coal-mine for example, as previously mentioned, if the mineral is derived from the surface, it is to the former of these arrangements that attention will be first directed. The working of coal and iron is considered hereafter, together with that of those minerals which are found in more irregular deposits. The general view of mining which falls within the limits of this article may conveniently be divided into the following considerations: the discovery of mineral veins or other deposits—the first opening of a mine and subsequent extension of the workings—the machinery and other appendages required by these operations, both underground and at the surface, with a brief notice of the surface works, and of mining economy and statistics.

Works of Discovery.—Mineral veins or beds are seldom visible on the surface of the ground, being generally concealed by the thick covering of diluvial matter which is spread over almost every portion of the globe, and hides from our view the solid rocky strata in which they are enclosed. In some cases, when it is desirable to work a vein, the miners, wanting to see it, may be distinctly traced at the surface, and still more frequently they are rendered visible by the indentation of excavated valleys, and the channels worn by mountain torrents. The same effect is often produced by the ice on the sea-shore, which, when it is broken up (which can always be noticed here) are furnished by geology, which teaches us that certain metals are most abundantly found in certain rocks, and further points out that they do not occupy any position indiscriminately in those rocks, but are almost exclusively found near their junction with other rocks of a different character, more especially near the contact of igneous masses with sedimentary strata, and that they commonly occur where rocks alternate together, and are broken and dislocated. In the case of veins and of discovering veins is called 'killas,' and either near its junction with protruded masses of granite, or where it is intersected by channels of a porphyritic rock termed 'elvan.' In Wales and the north of England, they are often found in a thin limestone or a boniferous limestone and rocks associated with it, especially in places where they are intersected and broken up by enormous faults and dislocations. Similar circumstances to these are very generally observed in all parts of the world, and it is also well ascertained that the local enrichment of veins is greatly influenced by their intersection with one another, and often indeed closely corresponds with the points of junction.

In addition to the general presumptions furnished by general scientific, another and more precise indication of the existence of metalliciferous deposits is afforded by finding pebbles or fragments of ore on or near the surface, generally either in the beds of streams or mixed up with superficial detritus. These scattered fragments, the result of almost action upon the outer of mineral veins or other deposits, may often be traced to particular spots, and thus the position of the deposits from which they originated may be established. In the north of England they are termed 'shoading,' should the exact situation of the vein whose existence has been ascertained in this or any other manner not be observable, it may be ascertained by opening trenches in the alluvial soil deep enough to expose the said rock, then the flat angles to the same. By this analog—you or the position of other veins in the neighbourhood would render it probable that the vein or veins in question might lie. This mode of finding veins is provincially termed in Cornwall 'costeeming.' The object of discovery may be still more effectually attained, but at a greater expense, by excavating a nearly horizontal passage termed 'level,' 'drift,' or 'adit,' from the bottom of the nearest valley, carrying it through the solid rock in the direction before mentioned, so as to intersect or 'cut' any mineral deposit which may exist in the ground through which it passes. This last plan is however seldom adopted, unless it is certain that the deposit will actually exist there, as it is too slow and too expensive to be undertaken upon uncertain grounds. Discoveries are sometimes made also by driving on the course of veins which occur near the surface of the earth, or by building a water-wheel to fall within the compass of working miners or persons of very small capital, and in some instances form the first step in opening mines which ultimately become of great importance.

Although the manner in which mineral deposits may be put sometimes are originally discovered has been thus detailed, it must not be supposed that the process is one of very frequent occurrence. The principal mineral districts in this and most other countries have been known and explored for ages, and by far the greater part of our mineral produce is extracted from deposits which have long been worked, the principal new discoveries being either made upon untried portions of known veins, or simply by excavating passages or 'cross-cuts' from mines now working, in a part of the vein of which they are wrought, so as to prove the adjoining ground.

Financial arrangements, &c.—When however a new vein or mineral deposit has been by any process discovered, if the indications of metallic produce are such as to render it certain that there is a mineral deposit, and that the consent of the proprietor, is the formation of a company for this purpose. For although mines are sometimes worked by individuals, experience has shown that a company is best adapted for carrying on mining operations, the amount of a capital required being less to determine the great, while a long period may elapse before adequate returns are made. Hence, not only in England, but in most other countries, the system of working mines by companies has been found very advantageous. Certain stipulations are then entered into between the company and the proprietor of the land in which the vein or deposit is situated, or, should the mineral right not belong to him, with the person who does possess it. The principal terms of this agreement are the disposition of ground within which operations may be carried on, and to stipulate the proportion of the gross mineral produce or its equivalent in money which the owner is to receive free of all expense in raising and making it marketable. It is the business of the company to bring the mine to the surface, and other considerations of less importance which are determined by the custom of the neighbourhood and other circumstances.

Before commencing operations, it is necessary to ascertain with some thoroughness (if it should not be previously known) the bearing or direction of the vein, and also its dip or 'underlie,' which may be done by sinking a few shallow pits upon it. These circumstances being known, there are two methods by which the vein may be explored, either by sinking upon its course from the surface, or by forming a horizontal passage to intersect it, commenced from some neighbouring valley or the lowest point on the surface which may be conveniently situated for the purpose, or on the crest of a hill if desirable. As however the practicability of forming a level or adit to prove the vein at a sufficient depth and within moderate limits as to time and expense must entirely depend on local circumstances, the former method, being the most expeditious, is regulated in the following manner.

Early Progress of the Works.—A spot determined either by convenience or by some promising indication is selected as the site of a shaft, which is frequently sunk in an inclined direction to the course of the vein, to be perpendicular, it is commenced upon that side towards which the vein inclines or underlies, and at such a distance from its 'back' or outer part, as to come down upon it at a given depth, say 10, 20, or 30 fathoms. This shaft is suited by lowering ladders to precipitate the trial, and the depth at which analogy may lead them to suppose that ore in any quantity may be found, the superficial parts of veins being usually quite unproductive.

On cutting the vein, the shaft is for a time suspended,
and two horizontal passages, often termed 'galleries,' but by the miner 'hovels,' are excavated or 'driven' upon the vein in both directions. These passages are usually about six feet in height and three or four in breadth, and rather smaller above than below. They are the principal means of exploring the contents of veins, and are made larger or smaller according to the richness of the ore and the nature of the enclosing rock. Should the shaft be intended to cut the vein at any considerable depth, it may be desirable to explore it above the point of intersection, and this is done by driving a short transverse level or 'cross-cut' to it, and driving the shaft levels from the place where the 'cross-cut' meets it, as before described. Should the depth of the shaft before reaching the vein be very considerable, two or three of these cross-cuts will be driven first, and levels extended from them. The perpendicular distance of the levels from each other is regulated both by custom and local circumstances, but is usually about ten fathoms, that interval having been found most convenient for the objects of the miner.

After cutting the vein, there are two modes of proceeding—continuing the shaft perpendicularly through the vein, or obliquely upon the vein. Which of these two plans is followed will depend in great measure upon its produce and promise, as already ascertained by the upper levels, and partly also on the means of the miner, the former plan being most expensive and requiring the longest time, although ultimately most advantageous, while the latter, though a cheaper and quicker mode of exploring the vein, since it renders cross-cuts unnecessary, and is itself constantly proving one portion of it, is not well adapted for the application of pumps and machinery, an evil which may not at first be very sensibly felt, but which increases proportionally with the depth of the mine, and the quantity of water and stuff which require to be drawn from it.

Such driving the shaft levels from the place where the work is particularly after cutting the vein, on reaching the depth of ten fathoms or thereabouts below the point of intersection another cross-cut will be driven to it; but as the shaft is now on the opposite side of the vein, this cross-cut will have an opposite direction to the former ones; and as they had successively become shorter as the shaft approached the vein, they will now successively become longer as the shaft proceeding perpendicularly downwards recedes further and further from the vein. In this manner the shaft proceeds indefinitely, cross-cuts being driven at every ten fathoms or whatever distance is most convenient, and levels extended from each upon the course of the vein, the nature and value of which are thus thoroughly explored. The continuance of these and other operations necessarily supposes that ore in some quantity has been found in the upper levels, which will have been all this time in progress, or at any rate that the indications of future produce are sufficiently strong to encourage the miner to proceed with his undertaking, the magnitude and expense of which will now be daily increasing, while various difficulties will be encountered in the progress of his works, more especially the want of ventilation in those parts which are most distant from the shaft, by which alone they can be supplied with air. It is claudly in the ends of the levels that the evil of imperfect ventilation begins to be felt, the air here gradually becoming close and unfit for respiration, as they advance further from the shaft, especially when from the hardness of the ground frequent blasting is necessary. As soon as this is found to be the case, a remedy of a very simple nature is applied, which consists in sinking a small pit, termed a 'winze,' upon the vein of course, from the upper level to the extremity of the one below it. This communication having been effected, the two levels become perfectly ventilated, each having a double communication with the atmosphere by which both an ascending and descending current is produced. By this plan it is evident that the levels may be extended for a considerable distance upon each side of the shaft, winzes being continuously formed between them at convenient intervals. Besides the purpose of ventilation, these winzes serve a mother use, since they make trial of the vein in the intermediate space between two levels, and also divide it into solid rectangular masses, which may be examined all round, and thus the miner has the means of judging with tolerable certainty as to the nature and value of the ores contained in each, and can extract the produce in the most expeditious and economical manner. That such is the case will at once be evident when it is considered that these portions of the vein are perfectly drained and ventilated, that they may be worked from as many points as may be convenient or may contain ore of sufficient value, and from this circumstance no necessity exists for breaking down the unproductive masses which are often found to intervene even where the vein is richest and the ore most continuous. When the vein has been properly laid open, the ore may be worked away round such unproductive pieces of ground, which, being left standing, will answer the purpose of supports to the rock on each side of the vein; and where the excavations are extensive, or at any rate necessary, and often requires the use of strong timbering.

The utility of winzes for working out the ore is indeed so great, that it is only when little or no ore has been found in a level that it will have proceeded far enough for ventilation and the convenience of which the convenience of which the miner has been made. When, on the contrary, the ore is found to be tolerably continuous in driving a level, winzes are generally sunk at intervals of 20 or 30 fathoms, their position being so regulated as to prove the richest parts of the upper levels, and to avoid hard and unproductive portions which do not appear worth working. We will suppose however that a continuous body of ore is met with in one of the upper levels, and that winzes have been regularly carried down to the level below it. Similar operations will then be required here, and winzes will be sunk from it to the next deeper one in the same manner, but they will generally be situated about midway between the former, so that each may explore the ground under the middle of the rectangle formed by the two upper winzes, and the levels between which they are placed, so as efficiently to explore the vein with the smallest number of excavations. The system of works by which a vein is then laid open, although by no means so regular, as not marking the necessary extent of the vein by courses of such horizontal joints of which may be supposed to represent the levels, and the vertical ones the winzes. In cases where the ore extends above the upper level in the mine, the part of the vein may be laid open by perpendicularly excavations similar to winzes, but formed in the reverse manner, or by 'raking' upwards instead of 'sinking' downwards, as in the former cases, the height to which these 'rises' are carried depending on the extent of the ore in that direction.
Should the vein be found to contain ore of good quality and in sufficient quantity, both laterally and in depth, the various operations which have now been described may proceed indefinitely. The shaft will continue to be sunk, cross-cuts driven to the vein at every ten fathoms or thereabouts, levels extended in both directions from them (the upper level being always of course considerably more advanced than the lower in progress), and the ground between them subdivided by winzes as before described. The excavations will now have assumed a regular form, and become what is properly termed a mine, the objects for which they were undertaken having been accomplished, or the contents of the vein thoroughly explored, and its produce, where of sufficient value, rendered capable of being economically and expeditiously extracted. In the accompanying sketch, fig. 1, this state of the works is shown, the shaded portion representing the parts of the mine where the ore has been extracted as described below. Fig. 2 gives a cross section of the mine, and with the former will completely illustrate the foregoing description.

**Raising of Ore.**—The operation last named, or the extraction of the ore, will not however have waited the advanced state of the works which we are now contemplating: a certain quantity will have been produced by driving the upper levels and sinking winzes below them, although not forming the primary object of these works; and wherever ore ground was seen in the ‘back’ or upper part of the level first driven, it will easily have been pursued upwards towards the surface, and will yield the first returns of the mine. When by the further progress of the works the vein has been divided into the solid rectangular masses before described, the mine will be brought into an effective state of working, and parties of men will be set to raise ore from all the most productive points. Where the vein is not very hard, the ore may be broken down with the ‘pick’ only, but it is generally necessary to blast it with powder, by which process large quantities are detached from the vein by every shot. In raising ores the men generally work upwards from the ‘back’ or upper part of one level towards the ‘bottom’ of another, and the excavations are so arranged that the ore may readily fall down to the level beneath the one upon which the miners are working to the shaft, and thence raised to the surface. As in all large and well-regulated mines it is desirable to keep the quantity of ore raised as nearly as possible to a uniform standard, the process of ‘opening ground,’ as above described, will generally be made to exceed the rate of extraction, so that a portion of the ore thus laid open may always be held as a reserve to keep up the returns of the mine during periods of temporary depression, when only pulp and reproductive ground may be presented by the works of discovery. This judicious mode of proceeding is justly regarded as one of the greatest modern improvements in the economy of mining: it provides a compensation for those great irregularities and fluctuations to which all mines are subject; it prevents the returns of the mine during temporary intervals of poverty, and enables those trials to be effected which may again place it in a productive state.

**Extension of the Works.**—As the workings of a mine become more extended, they gradually lose the simplicity which we have before been discussing, and, from the multiplication of shafts and other excavations, become highly complex, a result to which the irregularity of mineral deposits greatly contributes. The nature of those interior operations will now be briefly described, still considering the mine as a mere system of ventilating the main shaft; the subject of drainage, support, &c. When the levels have been extended to a considerable distance from the shaft, the ventilation will again become defective, notwithstanding the system of communication; the farther the greater distance it is carried, becomes more and more feeble; and this evil is still further augmented by the increasing number of men now employed in the works, the number of candles, and the frequent process of blasting. The expense of the transport of ore and masses of rock and rubbish from the shaft also becomes considerable; and if the prospects of the mine continue such as to warrant the expense, a new shaft must now be sunk on one or both sides of the former. Whether one or two shafts will be necessary will again depend on the direction in which the ore is found to extend, and the indications exhibited by the vein; and they will be so placed as to command that portion of it which, for reasons before stated, is without the reach of the former one, which by this time also may have become inadequate for the various purposes of extraction, drainage, &c., to which it is applied.

In order to avoid the expense and delay of unnecessary cross-cuts, the new shaft will be so placed as to intersect the vein much closer than the former; and this it may be so arranged as to correspond either with one of the deepest levels, or some proposed level deeper still. The new shaft may have been commenced in anticipation, while the levels were yet distant from the point where it is sunk; and in this case the communication will have been accelerated by driving levels to meet those which are proceeding from thence towards it. When this communication has been effected, its benefits will be immediately felt, both in the increased ventilation of the mine and the increased facilities afforded for the extraction of ore and stuff.

As the process of sinking a shaft is often extremely slow, from the hardness of the ground (one fathom per week being a very good average, and sometimes half that progress being scarcely attainable), and as the most productive workings of a mine may be greatly impeded for want of another outlet to the surface, expedition is often of the utmost importance to remedy this evil, and it thus becomes highly desirable to accelerate the operation. The perfection of the instrument surveying and marking the points by which the miner can accomplish this object by a very interesting process, whenever the workings of the mine have advanced near the spot where a shaft is required. The site of the shaft having been fixed upon and marked out at the surface, a series of intricate and irregular measurements of the length, windings, and direction of the levels, is enabled to ascertain correctly their relative position with regard to this spot, and consequently at what point each of them approaches nearest to a supposed vertical line penetrating the rock below it. This being ascertained, it is evident that by pursuing the same process still further, he may determine in what direction and to what distance cross-cuts must be driven from each of these points, in order to bring him exactly to this line, or underneath the site of the shaft; and having arrived there, that excavations exactly corresponding with it, both in form and dimensions, may proceed simultaneously both upwards and downwards from each cross-cut, while the shaft itself is being sunk from the surface, the work of ventilating the mine may be kept going at all points at the same time, as shown in fig. 3. It is found in practice that the various separate portions may be made to unite with surprising exactness; so much so, that even in very deep shafts, when complete, daylight may be obtained from the bottom level, and from the great accumulation of time which the process effects, it is now frequently used in mines of great depth, the working of which is much facilitated by it, as the work of many years may thus be brought within the compass of one or two men, the most remarkable instance on record being the shaft being sunk from several points at once occurred at the Consolidated Mines in Cornwall, about nine years ago, where a perpendicular shaft, 204 fathoms in depth, was completed in less than a twelvemonth, being worked from fifteen different points at once.
As the working of a mine proceeds, the increase of shafts and levels tends to obliterata, in a great degree, the uniformity and simplicity of operations which were at first apparent, the position of these works being entirely regulated by the irregular distribution of the productive parts of the vein, as developed in their progress. When the depth becomes considerable, many of the first shafts are rendered in great measure useless, either from being inclined, and thus inconvenient for machinery, or from having passed through the vein at a shallow depth, and thus requiring long cross-cuts previous to commencing the deeper levels. Hence, in very deep mines, a double line of shafts will often be found to range along the course of the principal veins; and sometimes even these shafts will be found opposed each other, and intersecting the same part of the vein successively at greater depths. In this case, while the most recent shafts are used for drainage and extraction, the older and more shallow ones are often fitted up as 'foot-ways,' and serve for the partial ascent and descent of the miners. In some of the large mines of Cornwall it is usual to sink two shafts within a few fathoms of each other, one being of large dimensions, and intended for a drainage or 'engine-shaft,' the other smaller, and adapted to drawing stuff only. This arrangement is found more convenient than having a single large shaft arranged for both purposes, for which however one shaft is often made to answer, being divided down the middle by timbering, and one side appropriated to the pumps and ladders, while the other is occupied by the 'kibbles' or iron buckets used for drawing the ore and in many cases the rubbish, when the latter cannot be conveniently disposed of underground.

Shafts in this country are generally sunk of a rectangular form, except in our coal mines, where a circular form is often preferred. Those employed for the extraction of ores, or 'whim-shafts,' are commonly six feet by four; those employed for drainage, or 'engine-shafts,' as they are generally termed, vary from about six feet by eight to eight by ten, or sometimes are rather larger. In coal-mines the pits are generally about seven or eight feet in diameter, the dimensions varying according to the nature of the ground and the arrangements proposed in them.

As veins are generally found to run nearly parallel, and often at no great distance from each other, and as the neighbourhood of a productive vein is made the subject of frequent investigation, the contents of other veins in its vicinity, transverse levels or 'cross-cuts' are frequently driven from mines at various depths, with a view to discovering side-veins, or making trial of branches which diverge from the main lode. Should a productive vein be found in the neighbourhood of the first, the most usual mode of working it is by extending levels upon it, at the same depth as those in the mine from which the cross-cuts are driven, commencing at the points where these intersect it. In this case the same shafts will probably serve for both the old mine and the new one, the one being, in fact, a mere appendage, as it were, to the other. Should the distance of the newly-discovered vein be considerable, it will prevent the workings from being carried on in this manner, both from the length of the cross-cuts and from the difficulty of ventilation and extraction; and it will therefore be necessary to sink shafts upon it, and lay it open as a separate mine, in a somewhat similar manner to that which has already been described.

Metalliferous veins are often traversed by other veins crossing them nearly at right angles, which seldom contain ore, excepting perhaps near the points of intersection; they are termed 'cross-cut veins' or 'cross-cut courses,' or more usually, 'most mines.' Cross-cuts are sometimes carried upon these veins, partly to explore their contents, and partly because the work will often proceed more rapidly than when in the solid rock; but this is not considered so effectual a mode of exploring the ground and discovering new veins as by driving in the rock itself.

The intersections of veins are very generally accompanied by a shifting and derangement of the metalliferous vein, the two portions of which, on the opposite sides of the cross-cut, are often separated to a very considerable distance. At such intersections occur, the metalliferous mass on which the miner had previously been working is completely lost on coming to a new vein; and it is frequently a work of considerable difficulty to recover it again, as the productive vein may be thrown or 'heaved' completely out of its former course. The first object to be ascertained, in the search for the dislocated vein, is in which direction the shaft is taken place, whether to the right hand or the left; and from analogy the miner is generally, though not always, enabled to form a correct judgment on this head. He then continues the level upon the cross-vein in this direction, till the metalliferous vein is again brought on the other side, and is continued upon it as before. If the search should be continued for a long distance without success, he will drive in the other direction, in expectation of meeting with it there.

An adit to a vein has been worked by driving a level towards it from a valley or other convenient point on the surface, the drainage to the point of intersection, of course, complete; and hence in mountainous countries, where deep ravines occur, levels may be brought in one after another, and so opened as to prevent the minerals to a considerable depth, almost superseding the use of machinery for this purpose. Levels thus opening to the surface, and serving for drainage, are termed 'day-levels' or 'adits,' and few mines are without them. In cases where the hill has been opened by sinking deep from the surface, which is the most common method, an adit is generally commenced from the bottom of some neighbouring valley (see Fig. A), which is driven towards the vein with a slight inclination, so that the water may naturally enter it; and it is generally true that mining districts adits have been formed of enormous length, traversing a considerable number of mines, and carrying off the water to the lowest practicable point of drainage.

The most remarkable work of this kind in England, or perhaps in the whole world, is the 'great adit' of the extensive mining district of Gwennap, in Cornwall: it commences in a valley near the sea, and very little above its level, and has been extended through all the neighbourhood, the total length of which is about twelve miles. The celebrated Nent Force level, in the north of England, forms a similar drain to the numerous mines on Alston Moor, and has been driven in a direct line between three and four miles, independently of its minor ramifications. In driving an adit, if the length be considerable before it reaches the mine which it is intended to drain, the distance is often divided into two or more portions by sinking shafts upon its course, and driving from the bottom of each one. This encourages the transit of the rubbish which is thrown from the mine, and can be done in proportion to the number of points from which operations may be commenced. Adits may often be made valuable as works of discovery, by making them cross the direction of the veins occurring in the district, so as to intersect them when they afford the richest vein, thus improving that vein at a cheap rate, by driving upon them at the points of intersection. In some cases adits may be carried almost entirely upon veins, to which they thus afford an important trial.

It is a fact worth observing, that at the shafts where the shafts are extended in the manner which has now been pointed out, and should the produce of the mine be considerable, the portions of the vein successively laid open continue productive, and other veins be discovered by cross-cutting in the vicinity, the whole may, for many years, be worked with but little diminution. Thus, in the course of time, from a few simple excavations, we obtain that almost infinite complication of
MIN shas, levels, cross-cuts, and other workings, which charac-
terise the workings of an extensive mine, with all its nu-
mberous appendages of pumps, machinery, and buildings.
The operations which have now been described are appli-
cable to all large and regular metallic veins situated in
countries where no distinct stratiﬁcation exists, and where
therefore, from the homogeneous nature of the rock, the me-
talllic produce may extend to very considerable depths with-
inout great fluctuation. The mining districts of Cornwall, and
those of Great Britain, are the best examples of this, tracing that
from the beginning to a mature and systematic development of it,
it must not be supposed that all mines are invariably worked upon
the same plan, or even that the first opening of mines is a
thing of very frequent occurrence. The local circumstances
of mines are so varied, and their course so complicated,
and complexity of mineral deposits so great, that a corre-
sponding diversity must exist in the means adapted for ex-
ploring them, and hence, although the general principles
and features are the same in all, no two mines will be ex-
actly alike, nor would the same unvarying processes be
suitable for them.

MINING TOOLS AND PROCESSES.—The tools and processes
employed by the miner in the extraction of the rock or
vein are simple, and will receive but a brief notice.

As his work is chiefly of two kinds, simply excavating
the ground when soft, and blasting it when hard, his tools
are suited to each process, the ‘pick’ and ‘gad’ being used for
the former; the ‘borer’ or ‘jumper’, and the ‘hammer’
for the latter, with a view to admit of more rapid and
easy f•res for ﬁring the shots, when the hole has been completed
to its proper depth. The pick is a very useful tool and
much employed by the miner both in working in the rock
and in breaking down ore where the ground is not so hard
as to require but a light stroke. The hammer is much used for
breaking the rock by one man with a heavy hammer;
but is smaller and more convenient, the iron head being
sharp and pointed at one end, and very short and hammer-
shaped at the other, a form which peculiarly adapts it to
under-ground use. The ‘gad’ or ‘scaper’ is a tool used in
conjunction with the pick; it is made of wrought iron,
and often with curved sides. The borer or jumper is an
iron rod or circular bar usually about two feet in length,
steeped and formed into a ﬂat sharp edge at the end; it
is driven into the rock by one man with a heavy hammer,
while the other continually turns it round so as to expose
the cutting edge to fresh surfaces of rock. The pulversed
matter is drawn out from time to time by a tool called
a ‘scaper’, and when the hole has proceeded to a sufﬁcient
depth, and been charged and ﬁlled with gunpowder, the pellet,
or, what is still better, a piece of copper wire, with
a loop at the end, is introduced, when the charge hav-
ing been ﬁrmly rammed down with clay or other soft mineral
substance, the whole is now covered with gunpowder
inserted in its place. The train is then ﬁred by a
slow match (often a piece of brown paper smeared with
grease), and the miners retire till the explosion has taken
place. A very ingenious contrivance for ﬁring the charge
was invented some years ago in Cornwall by Messrs. Rich-
ford, called the ‘safety fuse’, which is now getting into very
general use in our mining districts. The safety fuse con-
sicists of a small train of powder inserted in a water-proof
cord, and being cut to the required length, regulates the time
of the explosion by its known and steady rate of ignition.
The use of this contrivance and the substitution of copper
for iron in the ‘needle’, have contributed of late years
to prevent the accidents arising from premature explo-
sion, which were formerly of very common occurrence in
mines.

AUXILIARY OPERATIONS.—Having now considered mining
in the most simple point of view which the subject admits—
as the arrangement of a system of subterranean works
adapted to effect the great object of discovery, excavation,
ventilation, and drainage, it remains to notice the various
auxiliary operations which the progress of these works will
have required, and the complicated machinery which will
thus have been called into action, both on the surface and
under ground. Under the latter works, a number of
people have been directed towards two distinct objects, one portion
of them being subsidiary to the actual working of the mine
itself, and the other directed to the mechanical preparation
of the ore extracted, to render it in such a condition as to be
the best possible for the sake of the metal, which are ﬁnally consigned for reduct-
formed at a distance by a distant agency. We now proceed to consider the former of these two classes.

The underground workings of a mine will not have proceeded far before it becomes necessary to provide for several very important contingencies: water filters rapidly in, and, excepting where mines are worked by day levels or adits (or even then on sinking below them), requires some power to be provided for drawing it out; excavations are formed which require support; ventilation in places requires to be aided by mechanical means; and lastly, the continually increasing extraction of ore and rubbish renders powerful and efficient means indispensable for its discharge.

Drainage: Horse-shafts. - The drainage of a mine is one of the earliest things which it becomes necessary to provide for, as mineral veins are generally more open and porous than the surrounding rock, and thus form natural reservoirs into which the surface water collects. When penetrated by the workings of a mine, this natural drainage is rendered still more complex, and water pours abundantly into the excavations. The most obvious mode of relief, where local circumstances are favourable, is of course the formation of an adit, but excepting in very abrupt and mountainous countries, where this work can be readily executed, mechanical power soon becomes necessary. This may be in the first place afforded merely by a 'horse-whim,' which will serve to raise both the water and the stuff broken in sinking; and in its height and skill which skill and care were applied to the working of the mines, this simple apparatus was the only power used in their drainage and extraction. Its application on a large scale is however so enormously expensive, so complicated, and so inconvenient, that in the mines of Europe it is not in a limited plan, and mechanical power is substituted as soon as possible for animal labour.

The machine alluded to consists of an upright shaft carrying a large cylindrical cage or drum, and turned round by a long lever to which the horses are attached. A rope is coiled round the cage of the whim, with both ends at liberty, so that while one end is winding up, the other is unwinding, and both pass over a pulley placed above the shaft, having large iron buckets or kibbles attached to them, which by this arrangement are kept alternately ascending and descending, one kibble being loaded at the bottom while the other is emptied at the surface. This apparatus is termed a 'whim' in Cornwall, but in the north of England a 'whimmy' or 'ginn.' Where mines are not very deep it is a convenient auxiliary in the extraction, but particularly useful for drainage when the quantity of water is very trying, as in sinking a mere trial shaft. See fig. 5.

Water-wheel. - When the influx of water in a mine becomes at all considerable, recourse must be had to the power either of water or of steam to discharge it to the adit, or the surface, as the case may be. Should local circumstances be favourable to the application of water-power, it will of course be the preference, being recommended both by its economy and steadiness of action. The nearest stream of water available for this purpose will be turned into an artificial watercourse, or 'leat,' and conducted to the mine so as to obtain a sufficient fall to turn an overshot water-wheel, whose diameter and width will be regulated to receive it. Where a constant and abundant supply of water can be obtained, this power becomes extremely valuable, and the miner avails himself of it with great ingenuity, constructing large reservoirs in the valleys through which the stream passes, to render the supply more equal in time of drought, and erecting as many water-wheels on the mains, each receiving its supply from the tail of the race, as the declivity of the ground will admit. The water-wheels used in mines are invariably overshot; they vary from 10 or 11 ft. in diameter to more than 50, and from 2 to 3 or 6 or 7 ft. in breast; some of the largest exceed 100 horse-power. The German miners have long been celebrated for their skilful application of water-power, which, from the mountainous nature of their mining districts, easily presented itself to their notice. In this country, from the general application of the steam-engine to the drainage of mines, it has been less cultivated; but many fine instances of its use may be seen in some of our mines, where circumstances have been favourable to its adoption. Among these may be named the Fowey Consols Mines in Cornwall, the mines of Lead-Friends and Wheel-Betray in Devonshire, and the Grassington in Yorkshire. The application of a water-wheel to the drainage of a mine is shown in fig. 6.

Pumps. - During the erection of the water-wheel pumps are fixed in the shaft, proportioned in size to the quantity of water to be drawn, 10 or 12 inches in diameter being a very common size, where there is only a moderate influx. The pumps used in mines do not act at all by atmospheric pressure, as in the case of the common pumps arranged in 'liffs,' or columns, of considerable height, often indeed from 20 to 30 fathoms, the water being discharged into cisterns placed at the foot of each, and raised entirely by lifting or by pressure. The construction and arrangement of the pump-work forms a very important branch of mining, and one which, from the great depth of our mines, and the vast influx of water so common in them, has been much cultivated in this country, and consequently brought to great perfection. Water-pumps are commonly worked by a single pump-rod, which goes down the middle of it and communicates with each column by a rod attached to its side. In order to give a reciprocating motion to the main pump-rod, a crank on the axle of the water-wheel is attached to one end of a horizontal rod, the other end of which is fastened to an apparatus termed a 'bob,' consisting of an upright post movable at a centre, and firmly braced to a horizontal piece framed into it at the bottom, the further end of which is connected with the pump-rod. In this manner it will be seen that the rotary motion of the water-wheel is converted into a steady reciprocating motion when communicated to the pump-rod, the weight of which is always counterbalanced by a large box filled with stones, old iron, &c., which is attached on the opposite end of the balance beam (see fig. 6).

As the power of the water-wheels used in mines is naturally due to the gravity of the water, or the force it exerts on falling through a given space, minus the effects of friction, the only case where a considerable stream can be obtained that water-wheels of sufficient power can be erected, but in cases where the supply of water is very limited, and it is practicable to obtain a considerable fall, there is another very ingenuous mode of applying it, by which the principle of hydraulic pressure is called into action: the contrivance is termed the 'water-pressure engine,' and is employed in the shaft of the German mines, though only to a limited extent in this country. The principle consists in giving motion to a piston by the alternate pressure of a high column of water, which
having performed its office, the communication is cut off, and the water in the cylinder escapes. The apparatus is not in fact unlike the working portion of a steam-engine, the hydrostatic pressure of a column of water being substituted for the force of elastic vapour, and the reciprocating motion thus produced may be directly applied to set the pumps of a mine in action.

Steam-engine.—From the great abundance of coal which exists in this country, and the cheap rate at which it can be generated, the steam-engine has become the great auxiliary of the English miner, and in its present improved state it has greatly contributed, as before noticed, both to the perfection of our mining system and the enormous extraction of coal and metallic substances by which our mines are distinguished. In our coal-mines, where the fuel is of scarcely more than nominal value, the steam-engine is the only power ever employed for drainage, and in all deep and extensive works for extraction also. In our copper, tin, and lead mines, on those mines, where the carriage of coal renders the use of it more expensive, water-power is always, as far as possible, rendered available. In all the deepest and most extensive mines of this description the steam-engine is however indispensable, and both the drainage and extraction have been in great measure performed by it, since its use has been so greatly econolized by the reduced consumption of coal consequent upon late improvements.

The history and progressive improvements of the steam-engine are so intimately connected with its general application to mining purposes, and consequently with the present perfection which the art of mining has attained, and the vast produce afforded by our mines, that it requires some space to note the various stages which, with reference to the consumption of coal and quantity of water, the steam-engine has passed through from its first use for mining purposes in Cornwall (where, from the great expense of coal, all the late improvements have originated) by the standard termed duty, which accurately and conveniently defines the work performed, with reference to the consumption of both coal and water. Thus, by the duty of an engine is expressed the number of pounds (always millins) of water which have been raised through the height of one foot by the consumption of a bushel of coal. The following table states the quantity of water discharged from the pumps in a given time, and the quantity of coal consumed by the engine in the same period.

This mode of calculating the efficiency of steam-engines was first practised by Watt, who thus estimated the saving of fuel effected by his engine compared with the atmospheric engine perviously in use, one-third of this saving being the remuneration claimed by him for the use of his invention. An admirable system for the registration of the duty and other peculiarities of the engines employed in Cornwall was introduced by the engineer mentioned above, and this system has been ever since continued, the results being monthly ascertained and published in a convenient form. The effect of this system has been to excite an extraordinary degree of competition among the constructors, each striving to improve the duty of his engines in every possible manner. The improvements which have thus resulted have been so unexpected and so extraordinary as to excite suspicion and incredulity among those engineers who resided in other parts of England, who have only been removed by the most rigorous scrutiny and experiments.

The progressive improvement of the duty of steam-engines has been very accurately traced by Mr. John Taylor, in his 'Records of Mining'; and the following is a summary of the results which he obtained:

In 1769 the old atmospheric engine, by consuming a bushel of coal, raised 5,000,000 lbs. 1 ft. high. From 1778 to 1815, improved by Watt, 20,000,000 lbs. 1 ft. high. From 1815 to 1820, improved by the Cornish engineers, 28,000,000 lbs. 1 ft. high. From 1826 to 1827, 32,000,000 lbs. 1 ft. high. From 1827 to 1828, 37,000,000 lbs. 1 ft. high. From 1828 to 1829, 41,000,000 lbs. 1 ft. high. From 1829 to 1830, 43,500,000 lbs. 1 ft. high.

During the present year (1839) the advance has been, up to 54,000,000, at which it was stated in the usual return for the month of April last.

The above statement, it should be observed, refers only to the average duty, many of the best engines having always greatly exceeded this; and at the present time the duty of the best engines in Cornwall varies from about sixty to eighty millions. In the latter case therefore one bushel of coal performs as much work as fifteen bushels effected seventy years ago, or as was accomplished by four till within the last five and twenty years. Whon it is stated that some of the most powerful engines in Cornwall consume from three to four thousand bushels of coal per month, that some mines employ several of such engines, and that the mere expense of drainage is 12,000£ or 13,000£ per annum, the vast importance of the improvements above noticed will at once be appreciated.

Independently of the vast and practically unlimited power which the steam-engine places at our command, it may be considered as universal in its application, and entirely unrestricted by those limitations of local circumstances which circumscribe the utility of all other modes of drainage. The steam-engine may be erected on any spot which convenience requires, and possessing whatever degree of power may be considered requisite; fuel and water alone are needed for its operations; and while successive improvements have reduced the former to a fraction of its earlier consumption, it can always supply itself with the latter from the ground. This independence of local circumstances is of the more importance to the miner, as it is not in his power to make choice of localities: the manufacturer may erect his mill wherever water-power is abundant for driving his machinery, but the miner must carry on his operations on whatever spot nature has deposited her mineral treasures, and make the best of circumstances over which he can have no control. Thus the steam-engine, smokes in the narrow confines of Cornwall, are at the sea-level on the verge of the cliff at Botallack, and on the elevated table-land of Mexico.

The steam-engines employed for drainage are erected close to the shaft in which the pumps are fixed, which is called the 'engine-shaft'; one end of the beam hangs over the centre of it, and is attached to the pump-rod, which is raised at each stroke of the engine, afterwards sinking with its own weight, which is always counterbalanced by a fly-wheel, or balance-wheel, which is coupled to the engine. The power of the engine is exerted in raising the column of water in the pumps. The engine is generally enclosed in a large substantial building, either two or three stories high, which affords convenient access to every part of it. The centre of the beam is supported by the front wall of the house, and a low building attached to it contains the boilers, which in Cornwall, together with the steam-pipe and cylinder, are carefully cased and covered up with some non-conducting substances. The engine is supported in the middle by a 'capital' and 'shears' used in raising and lowering the pit-work, as shown in Fig. 7. The engines employed in draining mines have generally cylinders of not less than 40 inches in diameter, and the cylinders vary from that size to a diameter of 60 or 90 inches, the latter being the largest which has been constructed, and estimated at 300 horse-power. The chief peculiarities of the Cornish engines consist in using high-pressure steam (40 or 50 lbs. to the square inch) expansively, by cutting off the communication with the boiler at one-fourth or one-fifth of the stroke; in allowing a short interval between each stroke for the perfect condensation of the steam, and in carefully preventing the radiation of heat from the boiler, cylinder, &c. The engines employed in our
collieries present no peculiarity worthy of notice, nor has any great attention been paid to their improvement, owing to the cheap rate at which they can be supplied with fuel.

Support.—The support of mines is the next subject which requires our attention, and the extent to which it is necessary will depend very much on the nature of the enclosing rock, which may be either so hard as to stand of itself, or so soft as to crush together unless the excavations be properly secured. The mode of support used in mines is of three kinds—by leaving pillars of the vein, as before noticed, for which purpose the poorer masses are of course selected; by timbering; and by walling either with brick or stone. Timbering is a very common and convenient plan, and is thus practised:—In the case of a shaft, four pieces of timber of the requisite strength are framed into each other and fixed within at intervals of about four feet apart, the intermediate ground being supported by driving thin boards between each set of timbers and the rock. Levels are supported by three pieces of timber placed in the form of a doorway, rather narrower above than below, and framed together at the top (see fig. 8), the ground between each of these doorways being supported in the manner above noticed. Shafts and levels are sometimes also supported by walling, and in coal-mines the pits are generally lined throughout with brick-work. The 'gummi,' or large open excavations from which the ore has been taken, are kept open by strong pieces of timber placed across them, and pressing against the two walls of the vein, which they thus prevent from closing together, as might otherwise be the ease, especially where the vein was much inclined, and the pressure of the unsupported hanging wall is consequently great. These open spaces are very useful for disposing of the dead and rubbish which are continually accumulating underground when the workings are carried on in the rock or in unproductive parts of the vein, and which it would be useless and expensive to raise to the surface. For this purpose a 'stull' is formed by placing strong timbers in the backs of the levels, upon which boards are laid, so as to form a close covering over which the deads and stille (or rubbish) are then thrown, till the space above has been completely filled up. The pressure of this mass gives it sufficient solidity to support the walls of the vein in an effectual manner; but notwithstanding the large quantity of rubbish thus disposed of in mines, a great deal always remains to be taken to the surface as the waste heaps on the surface of every mine will show.

Ventilation.—The ventilation of mines is most generally and most effectually accomplished either by a judicious arrangement of the works and frequent communication with the surface than by mechanical means, although it sometimes becomes necessary to resort to the latter. It will be evident that in mines constructed on the principles which have previously been explained, the disposition of the shafts, levels, and winzes is such that the entire workings will always be traversed by currents of fresh air, and it is only in particular cases where circumstances prevent the sinking of a shaft in places where it may be required, or where great delay is experienced in effecting the usual communications, that any mechanical process of ventilation is rendered necessary. A very efficient machine for this purpose was invented some years ago by Mr. John Taylor. It consists of a cylindrical exhausting apparatus, which may be fixed at the mouth of a shaft or level, and placed in action by any convenient power, when, by means of a series of tubes connected with it, the foul air is extracted from the interior of the works, and of course the pure atmospheric air rushes in to supply the place, and the natural ventilation is then effected. In sinking shafts a very simple contrivance is often found sufficient; small wooden pipes made tolerably airtight are fixed in the pit from near the bottom to six or seven feet above the top, terminating in a funnel-shaped wooden box; and if the racking is done by a windlass, the platform placed a foot or two above the bottom, and in this manner a sufficient current of air is obtained to enable the miners to proceed.

In the north of England a contrivance called the 'water blast' is often used in driving long levels into rising ground; it consists in putting down either a bore-hole or small shaft near the end of the level, and turning a small stream of water into it, which falls into a cistern placed at the bottom, and is found to carry with it a sufficient current of air to ventilate the works. In coal-mines the ventilation is much more difficult, and, from the rapid generation of explosive gases, more important also. It is generally effected by two shafts, one of which is called the 'downcast,' and the other the 'upcast shaft,' thus forming the highest situation with reference to the dip of the coal, and has a large furnace continually burning near the bottom of it. The air being considerably rarified at this point, an ascending current is formed, which passes upwards to the surface of the earth. In another mine the upcast shaft is divided by a cross-vein of coal, which is closed and a platform placed a foot or two above the bottom, and in this manner a sufficient current of air is obtained to enable the miners to proceed.

Extraction.—The extraction of mines will require but little notice here, since it may be stated in general terms merely to require the adoption of an efficient prime mover to any convenient form of winding apparatus, a pumpage for the steam-engine is very usually employed, although where water-power can be obtained it is equally effective. The horse, whim, or gin, as already noticed, is very useful in small mines or isolated workings, and before the introduction of more powerful machinery was very extensively employed for raising ore and stuff from our mines. In shallow preliminary excavations the common windlass is often employed, and in underground work is much used for various purposes, especially in sinking winzes, and raising the stuff from works which have been worked on without any regular opening. The extraction of an extensive mine is enormous; indeed the quantity of ore raised is seldom more than one third or one-fourth, sometimes indeed a fifth, or less, of the mass of coal. In the mining of the solidified Mines in Cornwall the daily extraction is about 200 tons, a large proportion of which is raised from a depth of from 200 to nearly 300 fathoms. In the coal mines in the north of England the extraction is still greater, but here nearly the whole of the mass raised is more or less valuable, coal-mines being much less encumbered with dead or unproductive works than those of the metals. The South Hetton Colliery in Durham sends about 500 tons of coal 'to bank' daily, and is capable of affording a much larger extraction.

Mechanical preparation of Ores, or Dressing.—Having now traced the nature and progress of those subterraneous works by which access is obtained to mineral and metallic deposits, and their substance extracted, we may bring to a close the mechanical processes of separation, commonly termed ' dressing,' which fall within the province of the miner, and to the carrying on of which a large portion of the surface-works of every mine is devoted. The object of the dressing is to separate the ore from the accompanying, and, as before noticed, often mixed up with the ores, from the metallic portion, which is alone valuable; and the great principle upon which all the varied apparatus and processes which are used in different mines, and in different countries, depend, is to effect this separation. The difference in specific gravity between earthy and metallic matter, the one being generally double that of the other.
The dressing-floors of a mine are always arranged as near the mouths of the shafts as possible, so as to enable the ore being conveyed to them by a small railway and there on one or two sides ranges of sluices for the persons engaged to collect and wash the ore. The greatest part used in the operation, which commences by picking the ore, which is brought from the mine in large irregular lumps, as blasted or broken from the vein. These lumps, of which more than half is often merely spar and veinstone, and which are generally handled in a way commonly performed by boys and young women, when a good deal of the sparry matter is picked out by hand and at once rejected: the residue is moderate-sized pieces of ore, more or less broken up, and so the work is altogether done formerly. From rich veins a large proportion of the ore is obtained in a very pure state, and in this case it is only necessary to break down the large irregular masses into small fragments of a pretty equal size, in order to render it marketable and fit for the furnace, there being no earthly or sparry matter to separate from it. This rich ore is immediately therefore arranged in circular heaps upon the dressing floors, containing a certain number of tons each, commonly fifteen or twenty, and in this state it has much the appearance of the flint or coarser class of cinders. After being broken by hammers, and partially separated from the matrix by picking, have still a great variety of manipulations to undergo, which depend on the nature of the metal and the quality of the ore itself. In stamping is much relied on, and care must be taken to notice three, 'crushing,' or 'grinding,' 'jigging,' and 'stamping,' each of which is performed by an appropriate machine. The crushing-mill, or grinder, consists of one or more pairs of iron rollers, placed within a very short distance apart, and so turned that the action of a water-wheel or cog-wheels attached to it. Immediately above the rollers is a hopper, into which the lumps of poorer ore are thrown, when, falling through between the rollers, they are completely crushed and ground to powder. In the case of ores there are two or three pairs of rollers, those below being placed very near together, so as to reduce the stuff falling from above still finer, and by an ingenious application of sieves, kept in motion by the machine, the stuff can be sorted into two or three different sizes. Although by passing through the crushing-mill the ore, with its accompanying veinstone, has been reduced to very small fragments, the two substances are still as completely intermixed as ever; but in the next process, by the jigging-machine, they are to be separated. This machine consists of a wooden frame, open at the top, and provided with a strong screen, or iron grating, at the bottom: it hangs over a cistern of water, being suspended to a long lever, the motion of which is imparted to it by the power of the water. The motion first raises it out, with a peculiar jerk each time. The ores being placed in the sieve, and subjected for a short time to this operation, the heavy metallic pieces settle at the bottom, while the lighter fragments of spar and veinstone are thrown to the top, and every now and then very dexterously skimmed off with a piece of board by a man who stands by. In the operation of jiggling, a very important separation is thus effected, as three products are obtained by it—the small rich particles of ore which pass through the sieve into the cistern below, and are removed occasionally, as may be necessary; the larger rich fragments, which occupy the bottom of the cistern, and the poor earthy matter, which forms a layer at the top. This last product, although poor, still contains much minute particles of metallic fragments of rock or veinstone, many of which have small particles of ore either attached to them or intermixed with them, and, to any eye but that of the miner, would appear quite worthless, and more from the small quantity of the ore than the manifest difficulty of separating it from such a mass of stony matter.

To extract the ore from this refuse matter, several processes are used, which are chiefly grinding between rollers placed very close to each other, stamping to a fine powder,而又 by a process of stamping upon an inclined plane. In the operation the fine metallic mud or 'aline,' being carefully spread over the inclined plane at the upper end, a gentle stream of water is allowed to flow over it, which washes the light earthy particles towards the bottom, leaving a very pure state towards the top. In this process, and indeed all other operations of dressing in which a stream of water is employed, many of the smallest particles of metallic matter are carried away by it, the waste of which, in an extensive mine, would be considerable, it is arranged that such water shall pass into successive reservoirs, termed 'slims-pits,' in which the metallic particles fall to the bottom, and are from time to time concentrated to such an extent that they are collected for the valuable metal with which they were originally intermixed being by these processes almost entirely separated from them. When subsequently placed in the furnace, this residual earthy matter becomes rendered useless by oxidation of the flux, and forms the vitrified matter termed 'slag'; while by continued heat, the sulphur, oxygen, and other mineralizing substances, which are in a state of chemical combination with the metal, are entirely driven off, and the latter obtained in a pure state. These operations constitute the process of metallurgy.

Variations of the Process.—Any further detail on the subject of dressing would here be out of place; yet it is unnecessary to omit a few characteristic differences; and that the general outline indicated above is thus subject to considerable modification. In the case of tin ore, which is very intimately disseminated in the rock or veinstone, a very minute pulverization is required: hence the metal is generally separated by the process of stamping, and as the ores of this metal may be dressed so as to give a produce of 50 or 60 per cent., very great attention is paid to this point, and the various manipulations are carried on with a greater degree of attention than is usual. In the case of copper ores stamping is less used, but jigging forms a very important process, and has consequently undergone great improvements of late years, having given rise to a very ingenious and useful invention, called the 'patent separator,' the use of which has, both in this country and as the water kept in motion. This contrivance was invented by Mr. Thomas Petherick, late manager of the Fowell Consols Mines in Cornwall, where it has for several years been in successful operation. The ores of the precious metals require a peculiar treatment, being generally in a state of minute subdivision, and mixed up with a vast mass of earthly matter. Gold ores are usually stamped, and silver ores ground to an exceedingly fine powder; but from the great value of the metals, the process of washing is carried on differently from that of others, and, in some cases, is dispensed with altogether.

Management and Internal Economy of Mines.—Having now taken a general view of mining operations, and the auxiliary processes required in connection with them, the important branch of the subject which requires some notice, is the management and internal economy of mines. As it is on the due regulation of this point that the success of mines in a very great degree depends, it is important that those in other countries, received great attention, and been reduced to a system as perfect as possible. In England, more especially, all the practical improvements suggested by experience as essential to the profitable and well-regulated existence of large mining establishments have been freely adopted, as we are here unlettered by those formalities and restraints which influence the continental systems, individual interest being allowed a full and unlimited scope. The nature and importance of the subject, however, cannot be better expressed than in the words of a gentleman of the highest eminence as a mining-engineer, Mr. John Taylor, who has thus treated it, in connection with late mechanical improvements in the art of mining:

Important are the improvements which have been tried in the instruments which the progress of physical science has placed in our hands, those which relate to the government of large bodies of workmen, to the inducement to active enterprise on the part of the miners themselves, and to the removal of difficulties in their way, or of placing them in circumstances most favourable to effective exertion, are even more important, and to this may be added the judicious application of those inventions which have been noticed. It must be recollected, however, that after all, the operation of mining is for manual labour, and that we have no means as yet devised for penetrating the rocks which contain metallic treasures but those afforded by the patient and unre-
mitting labour of a great number of men. The regulation therefore of this force, and its due application, is, after all, more important to the success of mines than even the most ingenious mechanical expeditious. At a war which would undoubtedly fail, however well provided with the most perfect artillery and all the best constructed implements of war, unless the men for whom it might be directed, their efforts well combined, and their courage well assured by reasonable prospects of success, so in mining we may collect and apply the most complete mechanical arrangement. In the great majority of cases, manual labour, not directly directed, no beneficial results can be expected."

**System of Tutwork and Tribute.** — Such being the leading features of mining economy, we may proceed briefly to consider the manner in which they are practically carried into effect. In the deep mines of Cornwall, where, both from the amount of capital and the number of men employed, every exertion has been made to perfect the mining system, the results of which have since been extended from thence to other parts of England. All the underground work of mines in Cornwall, and indeed most other districts, is of two distinct kinds: dead work, or that carried on in the rock or metalliciferous deposit, for the purpose of trial and discovery; and productive labour, which is employed in the actual breaking down and extraction of the ore. The immense amount of manual labour requisite in these operations, and in the subsequent process of dressing the ores, the great expenditure of mining consists; and the great merit of the Cornish system has been in providing a solvable by a system of contracts, which effectually unite for a time the interests of the miner and his employer, while, being renewed at moderate intervals, it continually allows of that re-adjustment which the fluctuating circumstances of the mine may require: this work is denominated "tutwork," and the raising of ores "tribute." These two species of employment being, by an excellent division of labour common in all mines, kept entirely separate and performed by different individuals, who thus acquire great skill and judgment in their respective branches. The manner in which the contracts in tutwork and tribute are entirely different: in the former case, where the miner is employed in sinking shafts, driving levels, &c., the object being to extract as much useful labour as possible from him for a given sum, he is paid at so much per fathom, according to the work done; in the latter case, where the quality of the ore raised is a consideration equally important with its quantity, the miner receives a certain percentage on the actual value, being paid at the rate of so many shillings in the pound upon that value. The excellence of the above principle will readily be seen; and its advantages are still further increased by the open and public manner in which the contracts are made between the men and their employers, thus allowing of free competition as between the parties, and providing equally effective check against oppression from the latter.

The usual period for making new arrangements with the men is at the end of every two months, when, all previous bargains having expired, both parties are again perfectly free to regulate their contracts. Previously, then, to this day, every part of the mine is visited and inspected by the underground agents, who afterwards consult together, and determine their plan of operations for the next two months, registering in detail the work to be performed, and what the men are to be paid therefor according to the quality of the work. On the day appointed for the 'setting' or 'survey,' as it is termed, the men who usually work in the mine, together with others who may wish for employment there, assemble round the mine-office, upon a platform in front of which the agents, at the appointed time, make their appearance with a book in which their previous examination has been registered. Every piece of work to be performed in the mine is then called out in succession, and according to the quality of the work, the men are put down a percentage for working it on certain terms. The price thus offered is, in the first place, usually more than would be fair, or than the men themselves expect to get; consequently, the moment a price has been named, another offer will be made somewhat lower, and so on till the fair terms have been proposed, when the competition (except in rare cases) will cease, and the work or 'bargain' is considered as taken by the last and lowest bidder, whose name is immediately registered opposite to its description in the setting-book.

As each piece of work will require the labour not of one individual but of many, the transaction is still further complicated by the bargain being taken, and the contract made with one person only, each gang of men accustomed to work together always selecting one of their number to represent and act for them on these occasions. It is evidently desirable that there should be some plan for binding the men to their engaged men, so that they might not be capriciously given up previous to the expiration of the term; and this is the more necessary, as, owing to the frequent fluctuations of richness or of hardness incident to the working of a mine, the wages of the men employed may be found themselves unable to realise the amount of wages which they had anticipated: sometimes indeed the change may be so great, that it is not worth their while to go on with it at all. To meet these contingencies there is one plan by which the necessary supply of labour is provided: all the miners working there must subscribe; and by which fines are established for the non-payment of contracts, sufficiently heavy to prevent them from being given up while any fair probability exists of their being completed at any reasonable rate of remuneration. In this manner the exertions of the working miner are called into action, and prompted to surmount many of the minor obstacles and fluctuations which often baffle his calculations. Although it is true that in time of war there is generally a fine when a losing piece of work is given up, it must be remembered, on the other hand, the mine will often improve in quality instead of deteriorating; and in that case the miner will be greatly benefited, as his labour will be employed upon rich ores at the same wages. In this manner the system becomes more advantageous to the men as the whole community improve, and from this favourable change he may benefit as much as the exertions of himself and his co-partners will allow, till the fixed time for the renewal of the contracts again comes round. The set of regulations before alluded to are necessary for the proper management and conduct of the men; and by means of this simple code, the results of mutual and acknowledged interests, it is found in practice that the necessary discipline can be kept up over the large bodies of men employed in the mine. The mine naturally divides itself into several departments — the underground operations, the pit-work and machinery, the dressing and surface-work, accounts and financial matters, and so forth. Usually, also, the men who are royal and proper agents or superintendents are appointed, all being subordinate to a general manager, who communicates and advises with the whole body of the shareholders or 'adventurers' at stated periods, or more commonly only with a select committee of proprietors chosen by the miners, but once a year. It may be observed that the agents of a mine are usually chosen from the most intelligent working-miners, who are peculiarly well qualified by their thorough practical knowledge both to form a sound judgment upon the state of the works, and to keep a check upon any frauds which might be attempted by the men, while the selection affords a powerful stimulus to good conduct among them, since it may be attended with such advancement.

The general control of extensive mines is of course confined to the men whom we have named, and to the departments of attention are brought to the aid of the practical knowledge which superintend the inferior departments.

**Education and Qualifications of Miners.** — We may conclude that for the future education and qualifications of miners, and upon those institutions which have lately been established with a view to improvement in this respect. The business of the miner is essentially a practical one, and can only be acquired in the recesses of a mine, and in the mines themselves, and time a pronounced period for working it on certain terms. The price thus offered is, in the first place, usually more than would be fair, or than the men themselves expect to get; consequently, the moment a price has been named, another offer will be made somewhat lower, and so on till the fair terms have been proposed, when the competition (except in rare cases) will cease, and the work or 'bargain' is considered as taken by the last and lowest bidder, whose name is immediately registered opposite to its description in the setting-book.

As each piece of work will require the labour not of one
former science that the whole art of metallurgy is established. Again, we have seen that machinery and mechanical con-
trols are taught at every stage in the miner's profession, a circumstance which renders a knowledge of mechanics indispensable; and in pursuing the complicated operations of underground discovery, loss and error can only be avoided by the aid of geometry and subterranean surveying.

Thus the same manner of thought in the miner, the logical indications of coal and the known extent of its beds over very considerable areas, is justly certain to be found in the trials which are made for it, if carried on with proper judgment. The probable existence of beds of coal in both that having been determined, the whole of Europe by which mining is most successfully cultivated, the value and necessity of scientific knowledge among miners have long been perceived, and ample provisions have been made for its attainment, as may be seen in the mining-schools of France and Germany. Although Great Britain possesses the richest and most productive mines in the world, it is a singular fact that, till within the last two or three years, nothing has been done in this country to provide the means of instruction for those who are designed for the profession of mining. Thus both the working miner and the mine agent have, in this country, no knowledge whatever of the principles on which the success of their operations depends, but proceed entirely upon the practical skill which they have acquired in course of long experience.

It is true that, notwithstanding this disadvantage, the English miner has accomplished the most difficult undertakings, has conducted mines on the most extensive scale, and made the highest possible use of the means at his disposal; but when we consider the increasing depth of our mines, and the competition to which we are now exposed from foreign countries, it will be obvious that this defect should at length be remedied, and that the English miner should add to his acknowledged and innate practical skill all the benefits and resources to be attained from scientific knowledge.

Mining Schools.—When treating of the history of mining at the beginning of this article, the establishment of several institutions for the attainment of those qualifications which are necessary to the operations of civil and mining engineering was noticed as forming the most recent event connected with the subject, and in a few years' time the benefits thus derived will not be likely to be strikingly apparent. The mining-school at Carnarvon has recently placed in operation by Sir Charles Leman, will supply able miners well instructed in all the arts that are related to the working of our coal beds, and lead mines; while the university of Durham will produce mining engineers whose qualifications will have a more immediate influence on the operations of civil and mining engineering. In the present state of the science, and the increasing number of civil and mining engineers, it is evident that we may have a large number of mines which occur in the stratified rocks of the north of England. Thus by introducing a system of sound mining education, and by the continual progress of science, aided by the efforts which are now being made by government to carry the system into effect, we may have long been deprived of the chance of success, which is now presented to us with the mining interest, we may hope to still maintain our mines in a flourishing condition, notwithstanding the depth of their level, the increase of their expenditure, and the increasing competition of other countries.

MINING, COAL. Although it would be impracticable to enter upon the various modifications of mining processes which are required in the working of all the varied natural deposits of mineral wealth, the peculiarities of coal-mining are such as to require a brief notice, important and extensive as are the coal-mines of this country, and the arts and manufactures supported by them.

The nature and distribution of our coal-former deposits have been already fully described in the article Coal. The formation of coal beds is of three kinds—shale or slate, sandstone or rock-salt, and other minerals which are found in beds, the object to be attained is the effectual opening and extraction of a tolerably uniform mass of small thickness, but of great horizontal extension. The position of the different strata of coal beds, the object of research is fluctuating and irregular in its produce, and either vertical or highly inclined in its position. The thickness of beds of coal may be said generally to vary from three to thirty feet, from thirty to one hundred feet, from one hundred feet to one thousand feet, and from one thousand feet to one hundred thousand feet. The result of the art is that several seams come together without any intervening layers of rock, they may expand to twenty or thirty feet, of which we have an example in the 'ten-yard coal' of Staffordshire. In every coal-field there are many seams of coal at greater or lesser intervals, one below another, of which as many as three or four are frequently worked in the same mine; and interstratified with the rock which divides them there are many coal-dumps of extremely productive beds of ironstone, which are wrought at the same time, and in a similar manner with the coal.

The mode of working coal-mines will be most clearly understood by tracing the works from their commencement, in the first place. The railway, the carrier, and the main road are the first things to be considered in the mining of coal. Once these have been laid out, the bed of coal is generally considered as fixed, and the task of working it begins. The shaft is generally circular, and may vary according to circumstances from six to seven or eight or ten feet in diameter; the upper portion, as far down as the solid rock, is either bricked or walled, and where the ground is weak this casing may be continued throughout. On reaching the first workable seam of coal, the sinking of the pit is for a time suspended, and a broad straight passage termed a 'bord' or 'gale' is driven from it upon the seam of coal in opposite directions. The breadth of this passage is usually determined by the quality of the coal, and whether it is thin or thick, but it is formed in such a way as not to injure the seam of coal, so as to expose the stratum above, which is called the 'roof,' and the one below, which is termed the 'thill,' and its direction is always arranged so as to follow the direction of the strata in which the coal is supposed to present a clean uniform surface. When the bord or 'mother-gate' has proceeded some distance on both sides of the pit, narrow passages, termed 'headways,' are driven from it at regular intervals, and exactly at right angles; and when this is done each eight or ten feet of the bord is made to communicate with another bord, which is opened parallel to the first and on each side of it. It will be seen that by continuing this system of excavation the bed of coal will be divided into a number of boxes or bords, and that broad parallel passages or bords about eight yards apart, communicating with each other by narrower passages or 'headways,' which cross them at right angles, and likewise traverse the whole extent of the mines; immense square or rectangular pillars of coal being left standing between the two. A coal-mine in this state is not in fact unlike a regularly-built town; the bords and headways may be compared to the principal streets and the narrower streets which cross them; while the pillars of coal may be said to resemble the houses of the town.

The water encountered in the above operations is drawn to the surface by a powerful steam-engine erected on the shaft, which is so arranged as also to raise the coal and rubbish, for which purpose the steam-engine is commonly employed. Supposing the above operations to have been successful as regards the prospects of the mine, another shaft will now be commenced at some distance from the first, and when the communication between them has been effected, the one being made downcast and the other upcast, the air is conducted from the latter to the former through all the bords and workings, which it must traverse in succession in consequence of 'stoppings' or doors which are fixed in various places to obstruct its progress and give a proper direction to the current passing to the upper shaft. Till such communication can be formed, the first shaft may be divided by a 'brattice' or partition, and be made to answer the purposes of both; some few coal-mines are indeed worked entirely in this manner, but the danger of explosion is considerably diminished when the workings become extensive.

While the workings on the first seam of coal are thus going on, the shaft may be sunk to a second or third seam, where similar operations will be commenced, small under- ground workings may be going on in the same manner as in the former article. From the workings on the upper seam, to those on the seam below, by which ventilation will be promoted. These operations, like those described in the former article, may be carried on indefinitely, and will thus in time subdue the roof and its附近 uniformity of the workings how- ever are greatly modified by the occurrence of faults and other local accidents, and the pillars themselves are finally removed to such an extent as to cause subsidence of the roof and undulations of the floor, which present a most frightful appearance to the stranger.
The mode in which the pitman carries his excavation upon the coal is by cutting a narrow fissure in the seam on each side of the bord, and undermining the coal between, finally detaching the great cubical mass thus circumscribed by putting in two or three shots, which are simultaneously fired at the top of the seam. From 60 to 80 or 100 tons of coal may thus be brought down at once, when it is put into carriages drawn along a tram-road to the shaft, and thence raised by a steam-engine to the surface, where it is often passed over gratings or "screens" in order to separate the small fragments from the larger masses, which in coal countries are alone valuable.

In mines which are not endangered by explosive gases or "fire-damp," the coal-miner or "pitman" is guided in his operations by the light of a safety-lamp, which is smaller, and can be carried in a piece of moist clay; but where the fire-damp is apprehended the safety-lamp is used, which has long superseded the primitive contrivance of the steel-mill, the light of which was produced by the contact of a flint with the edge of a wheel kept in rapid motion. Notwithstanding the use of the Davy lamp, and the improvements which have taken place in ventilation, accidents from explosion are unfortunately still of frequent occurrence, although perhaps in most cases they may be traceable to some neglect on the part of the men themselves.

MINIUM. [LEAD, vol. viii, p. 370.]

MIN, a name for the Visio-vasell, Mustela (Putorius) Visum. [WEASEL.]

MINNISINGERS. [GERMANY—Language and Literature.]

MINNOW. [LEUCICUS.]

MINOR, (Latin) Less, or Lesser, is a term used to distinguish the mode or key that takes a minor 3rd.

MINORCA. [MINORCA.]

MINOS, in history, appears as the lawgiver of Crete. Those critics who consider all the personages of mythological history as little more than names to which is attached the history of social development, would view Minos simply as the concentration of that spirit of law which time began to work in the mind of Crete the forms of a regular polity. But we are not to consider, because there is much undeniably mythological about the history of Minos, that therefore he never existed. The concurrent testimony of Thucydides and Aristotle shows it to have been the general belief in their times, that Minos was the first among the Greeks who possessed any amount of naval power. According to the latter author, he conquered and colonised several islands, and at last perished in an expedition to Phaestus. In the second book of the "Politics," Aristotle draws a parallel between the Cretan and Spartan institutions, and he there ascribes the establishment of the Cretan laws to Minos. This comparison, aided probably by the connection which existed between Crete and Sparta, owing to colonies, as early as the time of Homer, has no doubt suggested the theory invented and supported by Müller, that Minos was a Doric prince; a theory, as Mr. Thrillwall asserts, utterly unknown to the ancients. The subject is ably discussed in the History of Greece, i. 125.

Some post-Homerian authorities make Minos a judge in Hades in company with Aeacus, Rhadamanthus being chief judge. In this character he appears in a short Platonic dialogue called the "Law," which however some critics consider spurious.

Minos is a son of Jupiter; this being the usual method taken by the mythographers to express a person so antient that they could put him on a level with no more mortal; and Plato also, as his father, he learns those laws which he afterwards delivers to men.

Minos is chiefly remarkable as belonging to a period when history and mythology interface, and as uniting in his character the chief characteristics of both. He is a son of Jupiter and yet the first possessor of a navy; a judge in Hades, but not the less for that a king of Crete. It is very curious, that Crete, so famous at this age, both for its naval power and for being the birth-place of the Olympian Jupiter, should afterwards continue so like that celebrity which its position seemed to promise. Its office seems to have been that of leading the way in naval supremacy. Too insulated for power of a durable nature, it was lost in the confederate or opposing glory of Athens and Sparta; but while they were yet in their infancy, its insular form (together perhaps with some Asiatic refinement) gave it that concentrated energy which in an early age is irresistible. Greece descends from Minos:...
MIN

249

MIN

on the frontier of this province. In the fatal retreat of the French army from Russia in 1812, it sustained great loss on the roads and in the fields. There are many other rivers of less note. The province has no great lakes.

The climate is not very different from that of White Russia. The cold in winter is so severe that the rivers are every year frozen over for some time; in spring there are frequently hard frosts; and there is a strong wind that blows in the north than in the south; in autumn the weather is agreeable and not variable, but the night frosts return in September, and winter begins at the end of October. On the whole the climate is healthy, but more so in the north than in the south. The sea-fish, such as smelts and flounder, is more common in Lithuania and White Russia.

Agriculture is the chief occupation of the inhabitants, and might raise them to a considerable degree of prosperity if they applied themselves properly to it; but Minsk is one of the most backward of all the provinces in the empire with respect to its agriculture. The fields are ill cultivated, the agricultural implements wretched, and the cattle miserable. The circles of Pinsk and Mogysy are real deserts. The grain generally cultivated is millet, which is easy of culture, but there are some barley and oats, and the nobles and great landowners grow some wheat. Buckwheat is grown on the heaths. The only other agricultural products are flax and hemp, both of excellent quality, which furnish linseed and tow for exportation. Krafts, hemp, and flax were to all intents and purposes of the greatest advantage to the industry and wealth of the place. Glutons, fish, emus, martens, and wild boars. The horses are of the Polish breed, and are very strong and hardy, but neither handsome nor large. Some of the noble and popular stations, especially in England, and all the neighboring countries, where no high scene of festivity was so complete that was not set off with the exercise of their talents; and where, so long as the spirit of chivalry subsisted, they were protected and caressed, because their services were attributed to the long passion of the times and to encouraging a martial spirit.

The minstrels seem to have been the genuine successors of the ancient bard, who, under different names, were admired and revered, from the earliest ages, among the people of Gaul, Britain, Ireland, and the north, and indeed by almost all the first inhabitants of Europe, whether of Celtic or Gothic race; but by none more than by our own Teutonic ancestors, particularly by the Danish tribes. Among these they were esteemed as 'manna; or mennyman, a word which denotes 'smoothers and polishers of language.' In short, poets and their art were held among them in that rude admiration which is ever shown by an ignorant people to such as excel them in intellectual accomplishment.

As these honours were paid to poetry and song, from the earliest times, in those countries which our Anglo-Saxon ancestors inhabited before their removal into Britain, Bishop Percy reasonably concludes that they would not be desired all their regard for men of this sort immediately on quitting their German forests; at least so long as they retained their ancient manners and opinions they would still hold them in high estimation. But as the Saxons, soon after their establishment in this island, were converted to Christianity, in proportion as literature prevailed among them, this rude admiration would begin to abate, and poetry would be no longer a peculiar profession. Thus the poet and the minstrel early became two persons in this island. Poetry was cultivated by men of letters indiscriminately; and many of the most popular rhymes were composed amidst the leisure and retirement of monasteries. But the minstrels continued a distinct order of men for many ages after the Conquest, and got their livelihood by singing verses to the harp at the houses of the great.
who played and sang, and even the dancers and mimics, were all considered as of one community, and were even all included in the common name of minstrels; hence no one may add their Latin names of Minni, Sourca, Histriones, Joculatoria, &c.

Joculator Regis was holding less than three villas in the return of the Domestacy Survey for Gloucestershire; and in the same survey, in Devon, we have a Joculatoria. Wace, Gaimar, and our own historians William of Malmsbury and Huntingdon, all concur in the statement that a warrior-minstrel of the name of Tailfer rode before the conqueror's army previous to the battle of Hastings, and, according to his own account, singing his awde in praise, and singing the song of Roland.

To trace the existence of the minstrel profession minutely through the reigns immediately subsequent to the Conquest seems unnecessary. Raberus, the founder of St. Bartholomew's Priory in Smithfield, is recorded as the 'simile Regis Henrici I.;' nor can we forget the cruel punishment inflicted on Lucas de Barre by that king, for excommunicating the minstrel to his disadvantage.

If King Henry I. was not an encourager of minstrels, his son Richard was himself of their number. The story of Bloude de Nesse, who went in search of Richard in his captivity, needs hardly to be repeated here. It is not so apocryphal as many have supposed. He came to a castle in which the minstrels who were entertaining the court of his privileged character gave him a near access to the fortress, and he began a song which he and Richard had composed together. When Richard heard the song, he knew it, and praised it; and when Bloude passed under the shadow of the first stanza, the king began the other, and completed the song.

The minstrels, it appears, were no less patronised by Richard than by the favourites and chief officers of his court. Tyrell, in his Passamort, gives us the story of a 'suffocation of Chauier' ('Cont. Tales, 4to. ed., vol. i., p. 39), shown from Hovenden that William bishop of Ely, Richard's chancellor, is expressly mentioned to have invited singers and minstrels from France, whom he loaded with rewards; and, in short, in return made him as the most accomplished person in the world.

Walter de Hemingford relates an anecdote of the fidelity of a minstrel who, in 1272, rushed into the tent of Edward I., at that time only prince, while on his expedition to the Holy Land, to rescue his master from a Saracen assassin.

In Rymer's 'Fcedera' (old ed., tom. iii., p. 978) we find King Edward II., in the sixteenth year of his reign, rewarding Arlette de Neste, who entertained him in certain houses in the villa of Pontefrect, which had lately belonged to John de Boteler, called 'Roi Bruniard' (probably another minstrel), the king's enemy.

The instances of regard shown to minstrels in subsequent reigns are very curious and remarkable. Wace, V., while preparing his great voyage to France in 1415, eighteen minstrels accompanied him, with an allowance of 12d. a day each (Rym., Bed., tom. ix., pp. 255, 260); and in the 34th Henry VI., a.d. 1446, an ordinance occurs for the imprisonment of youths to supply vacancies by death among the king's minstrels, 'ad quodam pueros, decentibus naturibus elegantes, in arte ministralium instructos, ubique inveniendi potest, tam infra libertatem quam extra capienda, et in servito nostro ad vada nostras ponendam.' (Ibid., tom. xi., p. 375.)

Warton, in his 'History of English Poetry,' vol. ii., p. 195, has cited several instances of the high pay to minstrels at this period.—During many of the years of the reign of Henry VI., as we are told in the 1438, at the annual feast of the fraternity of the Holy Cross at Abingdon, a town in Berkshire, twelve priests each received fourpence for singing a dirge; and the same number of minstrels were rewarded each with the same sum. The same document also states that the minstrels came only from Maydenhithorpe or Maidenhead, a town at no great distance, in the same county. In the year 1441 eight priests were hired from Coventry, to assist in celebrating a yearly oblation at the neighbouring priory of Moxstoke; as were six minstrels called maist, belonging to the family of Lord Clinton, who lived in the adjoining castle of Moxstoke, to sing, harp, and play in the hall of the monastery, during the extraordinary refection allowed to the monks on that anniversary. Two shillings were given to the priests, and four to the minstrels; and the latter are said to have supplied in camera picia, or the painted chamber of the convent, with the necessary appurtenances for the chamberlain furnished eight massy tapes of wax.

In the reign of Edward IV., a sergeant of the king's minstrels occurs, and in a manner which shows the confidential character of this officer, and his facility of access to the king at all hours and on all occasions. Hare's has printed the passage relating to him in a fragment concerning the ninth year of Edward IV. At the end of Spry's 'Chronicles':—'And as he (the king) was in the north country, in the middle of September, about six in the evening, he chased a boar, and he met the sergeant of the minstrels, came to him in good measure, and bade him alone, for he had enemies comming.'

From this period however the real character of the original minstrel was becoming rapidly extinguished, and even the name seems to have been gradually appropriated to the musician only. At queen Elizabeth's magnificent entertainment by Leicester, at Kenilworth Castle, in 1573, it is true a personage was introduced to amuse the queen, in the attire of an ancient minstrel, who called himself a 'square minstrel of Middlesex;' but this was, no doubt, a part of the masquerade: it was the representation of a former day, not one of an existing profession. Lansham ('Princely Pleasures of Kenilworth,' Nicholas's Progresses of Queen Elizabeth, vol. i., p. 107) says, 'And in this place he showed his voice with a hymn, and spout out with; wiped his lips with the holo of his hand, for fying his napkin, temper'd a string or too with his went, and, after a little singing of a song, he focused her eyes, and sang a solemn song, warranted for story ball of king Arthur's acts.'

Before Elizabeth closed her reign the degradation of minstrelsy was completed. By a statute in her 39th year and 1st in the 2nd of Edward VI., all common players of instruments, minstrels, minstrelsy, and common players of interludes, tinkers, and pedlars, were at one sweep included among rogues, vagabonds, and sturdy beggars, and adjudged to be punished accordingly. Rixdon quotes some satirical lines in allusion to this statute, written by a Dr. Bull:

When Jesus went to Jerusalem's house,
Whose daughter was about to dye,
He turn'd d the minstrel out of doors,
Among the rascal company:
Some say they are with common rogues,
And rogues by act of parliament.'

This act put an end to the genuine old minstrelsy as a profession; and the modern definition of minstrel is no more than 'a musician, a player upon some instrument.'

The MINT, a piece where money is coined, from the Anglo-Saxon mints, and that in all probability adopted from the Latin moneta.

Of the manner in which the Britons conducted the coinage of their rude substitutes for money no notices can now be gained. In the circumstances which I have been called on to describe, the old practice of providing for the state by the mint, where money was coined, from the Anglo-Saxon mints, and that in all probability adopted from the Latin moneta.

On the early Anglo-Saxon coins are found, in addition to the names of the kings, those of other persons also upon the same piece, who are with great probability conjectured to have been the moneyers, because on later Anglo-Saxon money the names of the moneyers rarely occur, with the addition of their title of office. From the circumstances of their names being inscribed on the coins, it is reasonable to conclude that they were responsible for the integrity of the money; and likewise that they were the principal officers of the mint. It is also certain that the early Domesday Book as to other officers of the mint, whilst they so frequently mention the moneyers, strongly corroborates the opinion that they were the only persons employed in the Anglo-Saxon mints, the Anglo-Norman mints, except perhaps occasional labourers. In the reign of Henry I. the money was so much debased as to call for exemplary punishment on the offenders, which is said to have been inflicted on moneyers only, without the least notice of any other officer.' (See Chron., sub An. 1185.) This was also
the case upon a similar occasion in the reign of Henry II.

(Cron. Joh. abb. S. Petri de Burgo, Sparke, p. 78.)

In the Anglo-Saxon times an officer called the reeve seems also to have had some kind of connection with the mint, or some jurisdiction over it; for in the laws of Canute it is provided, that if any person accused of false coinage should plead that he did it by licence from the reeve, that officer should clear himself, as the falsifier himself, which, in the same chapter of the law, is said to be the loss of that hand by which the crime was committed, without any redemption either by gold or silver. (Laws of Ine, ed. Sweet, p. 32.)

After the Norman conquest the officers of the mint appear to have been, in some degree, under the authority of the court of Exchequer, as they were admitted to their respective offices in that court, and took the usual oath of office before the treasurer and barons.

Ruding observes that if the gera, or reeve, above mentioned was not the presiding officer of the Anglo-Saxon mints, he is unable to ascertain at what period it became necessary to place some permanent superintending authority in the mint to prevent any ill-practices of the moneys; but he thinks it probable that such an officer was appointed between the 26 Henry II., when the moneys alone were punished for the adulteration of the money, and the third year of the reign when Henry III. conferred for the profits of the canumbium of all England, except Winchester. (Madox, Hist. Excheq., vol. ii., p. 132.)

The mint however did not attain its full constitution of superior officers until the 15 Edward II., when a comptroller first appears in the returns of the office of the warden and master, whose accounts also were distinct from each other. Thus they operated as mutual checks, and no fraud could be practised without the concurrence of all those three persons.

On the principal officers, namely, that of coineur, and probably others, descended by inheritance even in the female line, and the inheritor was sometimes allowed to sell it. See Ruding's account of this office in his Annals of the Exchequer, ed. Sweet, p. 116-114, for its descent is traced from the time of Edward I. by a paper to the 4 Richard II.

In the Anglo-Saxon and the early Norman period there were many mints beside the king's, and some were continued to a much later time. Barons and bishops struck money, especially in King Stephen's reign, and in two or three instances the privilege of coining was granted to greater monasteries. Wolsey's exercise of this franchise, both as bishop of Durham and archbishop of York, is well known. Coines also were minted in the counties of Oxford and Lincoln, distinctly marked as such, at intervals from Jaenberht, consecrated in 793, to the close of the reign of Henry VIII. Of the lay barons of Stephen's time, we have but one coin known, no others, except to the period of Pegge's Dissertation on the Coins of the archbishops of Canterbury. Noble's on those of the bishops of Durham, and more particularly Ruding's enumeration of the places where Mints and Exchanges have been fixed in Britain and its dependencies, will supply the reader with the most ample information upon this subject.

From a very early time the moneys seem to have enjoyed exclusive privileges. In the 33 Henry II. the moneys of York were expressly exempted from the payment of all local taxes, (Cl. 18, p. 7.) and action with respect to those privileges appear to have been extended to the whole body of officers belonging to the mint; for at that time the bailiffs, &c. of Canterbury were ordered to appear in the Exchequer for any default in an act which was to be taken from them by any purveyor of the queen, or her heirs, any statute to the contrary notwithstanding. This charter bore date at Westminster on the 20th February, and there were subsequent confirmations of it in the second, third, fourth, and fifth years of her reign, (Cl. 414.)

Ruding has cited various instances in which these privileges were intertrenched upon: they were nevertheless confirmed by King James I. in the second year of his reign; and King Charles II. in 1677, when he indented such which was in force in the year 1744, and which established the officers in their houses, places, &c., in their charters and privileges.

These privileges they continue to enjoy to the present time.

The following is the establishment of which the Mint at present consists:—

(See also the Minter's Book, vol. ii., p. 47.)
MIN 252

MIN

1. Master and Worker, who is one of the queen's ministers. 2. The principal officers, forming a Board, viz.:—
The Deputy Master, Comptroller, King's Assay Master, King's Clerk, and the Superintendent of Machinery and Die.
3. Officers in the service, viz.:—
The Master Assayer, Proctor Assayer, Valuer and Clerk, Surveyor of Moltings, Surveyor of Money-Peases, Chief Engraver, Sealer, Foreman, Medalist, and Clerk Assistant and Deputy Master.

Besides these there are four clerks in the Mint-office, two porters, and two or three other inferior persons.

The Company of Monayers receive a rate on the coinage, conditionally 40l. to each member when the coinage is under 500,000l.

Ruding has given some slight notices as to the wages of the officers of the mint from the records of early times. In the reign of Edward I. it was as follows:—
In the 33rd Edward I. the porter of the mint and exchange received ninepence a-day, and the same in the 9 Edward II. and 23 Edward III. The warden's salary in the 23rd Edward I. was, as before, two shillings a-day, at which time he received the equivalent and the keeper of the dice sixpence a-day. In the 25 and 31 Henry VI. it was two shillings and sixpence.

In Henry VI.'s 32nd year the engraver had twenty pounds per annum. The person who held the office of master of the press, exchanger, and assayer, in the 1 Edward IV., was to take the usual daily wages, amounting to 25l. 13s. 4d. per annum. In the second year of the same king the engraver's wages were, as before, twenty pounds per annum, and in his sixth year the salary of the warden was increased to twelve pounds a-year.

In the 10 Edward III. the workmen of the mint of London petitioned the king for an increase of their allowance for coinage, alleging that they were at that time at greater expense, and bestowed more labour in forming the moneys than had been usual in former times; so that they could not maintain and continue such expense and labour, unless their allowance was increased. The king, being willing to grant their petition, if just, commanded John de Wyndesore, warden of the mint of London, and Roger and others experienced in such matters, to inquire whether the allowance was sufficient, and if not, to determine what addition should be made; and they were ordered to make their report in Chancery, under their seals, without delay. They found that not only were expenses increased, but wages of the masons and workmen increased, and increased in the same manner as the wages of the workmen in London, and Stephen Boke, having been examined upon oath by the warden, the following report was made:—That, having inquired diligently respecting the necessary expenses occasioned by the waste arising from the whitening of the halfpennies and farthings, on account of the increase of the alloy, and from the hardening of the metal of the said coins in working and coining, they were of opinion that the work could not be made on without an increase of threepence for each pound, at least, and with that the workmen ought reasonably to be contented. Then, whereas of old they received for all costs, colour, &c. for a pound of halfpennies sevenpence-halfpenny, and for a pound of farthings ninepence-halfpenny, they would receive for the former tenpence-halfpenny, and for the latter twelvetwentieths-halfpenny; so that the master should have of increase twopence, and the workmen one penny.

Ruding (vol. i., p. 51-58) has given the tables of fees and wages of the officers in the years 1584, 1599, 1649, 1688, 1739, 1743, and 1797.

A comparative statement of the salaries and allowances, contingent expenses, and rates of coinage, between the establishment in 15th and 16th Century, and the present establishment in 1836 will be found, p. 87-89 of the Appendix to the 'Report from the Select Committee of the House of Commons on the Royal Mint,' ordered to be printed 30th June, 1837.

In antient times extraordinary methods were resorted to in order to furnish the mint with workmen. Thus in the 31st Henry III., a writ was issued, authorising Reynier de Beyssel to bring into England, from beyond the sea, persons skilled in the shaping and exchange of silver, to work in the kingdom at the King's charge. (Pat. 31 Hen. III., m. 3.) And in the 23d Edw. III., Henry de Brusell and John de Ceste, masters of the mint, were appointed by letters-patent to choose and take as many goldsmiths, smiths, and other workmen in the city of London and other places, where it might seem expedient to them, as should be necessary for the works of the mint in the Tower of London; and to bring the said workmen to the said Tower, and to place them there to work at the wages allowed by the said masters. Any of them which should be rebellious in that case, to seize and arrest, and to detain in prison within the said Tower, and to keep in safe custody until the king should determine upon their punishment. These letters were sealed to all shire and city officers to demand to assist the said masters in carrying their provisions into execution. (Pat. 25 Edw. III., p. 2, m. 13 dors.)

This power to take workmen, &c. for the service of the mint was not discontinued in the reign of Elizabeth. (Jnst. with Lorisom, 14 Elizabeth, in Harl. MSS., Brit. Mus., 698.)

The custom of placing the moneyer's name upon the coins prevailed, as already observed, at a very early period in this country. In the reign of Edward I. the mint at King's Forres, in Scotland, was, as at the same period in England, under the control of the king of Kent, which is the second in point of antiquity in the Anglo-Saxon series, and must be dated about the middle of the seventh century. It was usually stamped upon the reverse of the coin, but it is not found upon the coinage of Kent, where the name of the monarch is removed to the other side. The names of two moneyers sometimes occur upon the same coin. From the time of Athelstan, with some few exceptions only, the name of the town was seen under the coinage of each moneyer, so that the money should be coined within some town. (Wilkins, Leg. Angl.-Sax., p. 319.) The name of the moneyer is not found lower than the reign of Edward I., but that of the mint was not entirely dispensed in the last year of Queen Elizabeth.

Metal brought to the mint was assayed, reduced to standard, and then formed into money, by the instruments which at different periods have been invented for that purpose.

The mode of coinage in early times, at least in this country, as far as it can now be traced, was rude and inartificial; the sole expedient employed being to fix one die firmly in a wooden block, and to hold the other in the hand of the strike, which, by striking it with a hammer, formed a regular coin. This process, repeatedly, with a hammer, the impression required was at length worked up.

This method appears to have been nearly coeval with the first invention of coined money; and it is a singular fact that no one seems to have reflected upon it, until the power of the screw was applied to coinage in the French mint about the middle of the sixteenth century. (Le Blain, Traité Hist. de Monnayes de France, p. 268.)

The new invention was not however admitted into use until before the year 1561, when it was used together with the old method of coinage by the hammer, until the latter was wholly laid aside in the 14th Charles II., a.d. 1667. From that time to the present, only very trivial improvements have been made, and the machine continues to be worked. It consists of a screw, to which the upper die is connected; this is worked by a fly, and forces that die which is attached to it with considerable force upon the other die, which is firmly fixed below. The advantage of this machine (known by the name of the mill and screw) over the old mode of striking with a hammer consists chiefly in the increase of force, which is so great as to raise the impression at one blow. The edges of the hammered money were left in a rude and unfinished state, which rendered them peculiarly liable to be dimmed by the chipping, and afterwards introduced, the coins began to assume a form nearly circular, which admitted of some addition to the impression, for the purpose of preserving the outward edge. This was first attempted by placing on the reverse face of the screw a false circle on the outside of the legend, quite to the edge of the coin. The earliest specimens of Elizabeth's milled money present instances of this invention. Afterwards, a legend was impressed upon the edge of the larger pieces; but this, it is believed, did not take place until the year 1641.
the coins made by Blondeau and Ramage, for the Commonwealth, of that date. This impression is given to the edge of each coin, as if having passed it between two plates, one of which is fixed, and the other moveable by a pinion which works in teeth on the back edge of it. One half of the legend is engraved on each of these plates, so that when the coin has been passed from one plate to the other, the legend which is fixed, it is then marked upon the whole of the edge. This machine was invented by M. Castaing, in 1665, and was introduced by him into the French mint. (Boizard, *Traité de Monnayage*, tom 1, p. 142.) Before this invention the mintings took place upon blanks in a collar which contained the legend, and was of the same diameter as the piece, but of less thickness. The metal, thus placed, being struck with the die, expanded under it, and received the form of whatever was engraved on the inside of the collar, which opened with four joints in order to permit the coins to be taken out.

As it is scarcely practicable to impress a legend upon the rim of the smaller coins, a graining has been devised for the protection of their outer edge. This, which is generally known by the technical term "milling," was first used in 1663, the strokes at that time going at right angles across the edge. That mode continued until 1669, when diagonal strokes were introduced. But these also being found insufficient, the milled edge was employed to the end of 1739, which added something to the difficulty of counterfeiting the milled; and the edge of the coin was still further protected by placing the top of the letters as close as possible to it. The position of the letters close to the edge of the coin and the name of the guinea of William and Mary, is still continued.

From the money, when completely finished, two pieces are to be taken from every fifteen pounds weight of gold, and two, at least, from every sixty pounds weight of silver; one for the private essay within the mint, and the other for the trial of the Privy.

The following is the process which at present takes place, from the time at which an ingot of gold is imported into the mint, to the period when it becomes a piece of money, as seen in evidence to the committee on the royal mint, April 18, 1837, by J. W. Morrison, Esq., the deputy-master.

The bullion or ingots are brought to the mint, and it being ascertained that such ingot has been melted by approved refiners in the trade, and also an assay upon the purchase by the king's assayer, they are taken into the master's essay-office, where pieces are cut out for him to assay; the ingots are then locked up under the keys of the deputy-master, and the assayer. The ingots are reported by the master assayer, they are weighed by the weigher and teller in the mint-office, in the presence of the importer and the mint officers and the clerks, who calculate the fineness of each ingot, and ascertain the standard of the alloy, they are put into the mould, and a receipt is given to the importer, signed by the deputy-master and witnessed by the comptroller and king's clerk; the mint being bound to return an equal weight of standard coin. The ingots are then made up into pots of a certain weight, and a portion of alloy or fine metal calculated, which is to be added in the melting to produce the standard; they are then cast into bars fit for the moneyer's operation; an assay being made by the king's assayer, with reference to the delivery of the bars, from a sample taken from each pot by the surveyor of melting for that assay, the moneyer rolls the bars to proper thickness, and cuts out the pieces for the stamping of the intended coin; and having made that piece of the right weight, they are coined, and given to those who are entitled to weigh for weight; the ingot of the assay, the comptroller, the king's clerk, weigher and teller, at the process called the pix. The money is then locked up till the assay is reported by the king's assayer, and the weight and value of the ingot of the assay is expressed in the mint bill which had been given, and which bill and receipt are then returned.

The reader who desires more extensive information than is here given upon the subject of the mint must consult the "Notice of the Mint" and the "History of the French mint," already referred to, in the Appendix to which he will also find a large collection of papers relating to the French mint, the mint of the United States, and the Dutch mint. [BULLION; EXCHANGE; MINUCIUS, FELIX, a Latin Christian writer of the third century, was a native of Africa, came to live at Rome, where he exercised the profession of advocate, and was the friend of Varro; Augustine; and Jerome, for his eloquence. We have a work by him, entitled 'Octavius,' which is a dialogue between a Christian called Octavius and a heathen called Caelesius, concerning the merits of the two religions which were then striving for supremacy. In this dialogue, Octavius repels the absurd imputations of the heathens against the early Christians, whom they accused of all sorts of impurities and crimes in their religious meetings. Through fear of persecution these heretics met nightly at night and in concealed places, which circumstances offended the heathen's sense of vulgar ignorance. At the same time Octavius retorts upon his co-disputant by exposing the notoriously licentious practices of the heathens. The style of this work is argumentative and sufficiently pure; the language is animated, and the mode of treating the subject attractive, being mixed up with mythological learning and much information concerning the customs and opinions of that interesting period. As an apology of Christianity, the work of Minucius Felix, or Faustus, is a companion to those of Clemens Alexandre, Athenagoras, Theophilus of Antioch, Justinus, Tertullianus, and other early advocates of the Christian faith in its times of trial and depression, and forms a link between them and those of the second and third centuries. Of the book of Minucius Felix, the 8th edition, 1695, and the fourth edition, 1709, have gone through many editions, among which those by James Gronovius, Leyden, 1709, and Davis, Cambridge, 1712, deserve notice. The latter is accompanied by numerous notes by Dyer, and a dissertation or commentary by Baldwin. The 'Octavius' has been translated into French by the Abbé de Gourcy. Another work, entitled 'De Fato,' against astrologers, is mentioned by Jerome as being ascribed to Minucius, although Jerome expresses doubts concerning its authorship. This work is lost.

The 'Octavius' was at one time attributed to Arnobius, and was inserted as the 8th book of his Disputations. As Arnobius wrote in Latin, and not in the Greek language, which the author of the 'Octavius' used, it is evident that the work was not his. Arnobius, on the other hand, has published a Dissertation on Minucius, Kiel, 1685.

MINUET (menuet, Fr.), a graceful slow dance, which, according to Brossard, had its origin in Poitou, and, we conjecture, first made its appearance either in the middle or towards the end of the seventeenth century, for the term is not found in Mersenne's Lexicon, and is met with in the opera of Lully. Ménage derives the word from menuet, little, the pieces of the minuet being small.

The minuet, as a dance, consists of two strains or parts, of eight bars each, the second of the same strain being repeated; but as it seems to have been introduced first with hoops and hair-powder, so it passed away with them, and, except now and then on the stage, is only seen in the dancing-schools. As an exclusively musical movement, in which the dance is the chief part, it generally comprises sixteen bars, both strains being repeated; and it is followed by a second, called the trio; after which the minuet is played once more, straight through. But composers are not very strict as to its length, or to that of its supplement the trio. For the latter kind of minuet we are indebted to Germany: its time is always quick—allegro; and when repeated after the trio, the movement is rather accelerated.

MINUTE (minuum, portio minuta). [ANGLE; TIME; SEXAGESIMALS.] MINX, a name for the Vison-veasel. MINX-OTTER, Pennant's name for the Vison-veasel. MINZO'NI, OON'FROIO, more distinguished for the quality than the quantity of his poetry, in which last respect he is only one of the minor bards of Italy, was born at Ferrara, in 1734. He was educated by the Jesuits, and applied himself with great industry to the study of mathematics; but his forte lay rather in poetry,—it is as a poet, at least, that his name is handed down to posterity. Imbued with the study of Dante and Ariosto, he had caught much of their vigour of thought and energy of expression; and he sought to renew, in his rhyming fables, the style of the hexameters which, in his time, were too generally accepted as equivalent to genuine poetry. Freshness of thought, distinctness of imagery, and nobleness of language are the characteristics of his poems, which consist chiefly of sonnets. He likewise distinguished himself by his eloquence.
in the pulpit so highly, that the citizens of Ferrara struck a medal in honour of him in 1652. In 1780 he was made cardinal and in 1654, that city, which office he discharged with the most exemplary zeal.

MIOSEN, Luke. [Christiania?]

MIRABAUD, JEAN BAPTISTE DE, born at Paris, in 1758, first entered the ministry, but left it nine years after to devote himself to literature. He made himself known by a French translation of Tasso's 'Jerusalem,' which he published in 1724. He was afterwards made a member of the French Academy, of which he became secretary in 1764. He died at Paris on March 6, 1779. Besides the above-mentioned translation, and a very inferior one of Ariosto's poem, he wrote 1, 'Le Monde, son Origine et son Antiquité,' 2, 'Opinions des Anciens sur les Juifs,' 3, 'Sentiments des Philosophes sur la Nature de l'âme,' and 'De l'Économie du Milieu de la Nature,' which made much noise at the time of its publication, was attributed to Mirabeau, but is known to have been written by the Baron d'Holbach, with the assistance of some of his friends. [Holbach.]

MIRABEAU, HONORÉ GABRIEL DE RIQUETI, COUNT OF, was born at Bignon, near Némours, in 1759, of a family which had emigrated from Florence in the thirteenth century, the name of which, Arrigibetti, had been given to that of Riqueti, from that of the marquis de Riqueti, a man of some literary note, the author of 'L'Ami des Hommes' and other works, and one of the leaders of the school of the 'Economistes.' The marquis, though a great advocate of liberty and philanthropy in his own family, was a very harsh and unscrupulous father, and his harshness probably contributed to sour the temper of his son, and to drive him into the excesses which stained his earlier career. Young Mirabeau had violent passions, an unbounded imagination, and great abilities. He was fond of pleasure, of love intrigues, and of spending money, and his father knew no better means of checking his irregularities than by obtaining 'lettres de cachet' against his son, and confining him in several state prisons in succession. His first imprisonment was in consequence of a duel, which Mirabeau served for some time in the army, on leaving which he married a young lady who had been promised to another. His dissipation however rendered the match an unhappy one; he became embittered with debts, his father obtained an interdict against him, which declared him incapable of administering his property, and moreover a lettre de cachet, by which he was confined in the castle of Joux, in the Jura mountains. He was then twenty-five years of age. His captivating address won over the commander of the fort, who allowed him to walk about the neighbouring town of Pontarier, where he made the acquaintance of a young lady, the wife of an old man who was a magistrate in that province. Mirabeau seduced her, and carried her off to Paris. This is the first of a number of affairs which Mirabeau afterwards addressed several licentious works under the name of Sophie. For this offence the parliament of Dijon condemned him to death par contumace.

In Holland Mirabeau began to work for the booksellers as a means of subsistence. While he was thus employed, he was seized by the agents of the Dutch police, with the consent of the Dutch authorities, and was finally shut up in the dungeon of Vincennes near Paris, where he remained more than two years. During his confinement he went through a course of general reading, made translations from Latin and modern foreign authors, formed a collection of extracts, and wrote several works, most of which were of the amorous kind, and some of them obscene. He carried on an extensive correspondence with his mistress Sophie, which was published after his death.

On his release in 1780 he wrote his work 'On the Lettres de Cachet, and on State Prisons,' which made a deep impression on the public. Repairing to Pontarier, he pleaded in his own defence the cause of his imprisoned brother-in-law, and entered into a compromise by which the prosecution was quashed.

About 1784 he visited London, where he became acquainted with Dr. Johnson, from England, to which he wrote 'Letters to Chauvet,' in which he praised the institutions of the country. 'Mirabeau,' says his friend and biographer Dumont, 'was then engaged in a work on the American order of Cincinnati, and he had in his portfolio plans and sketches of several other works, upon which he took good care to consult every person capable of affording him information. He was then poor, and obliged to live by his pen as the 'Doux Père de la Liberté et de la Justice,' (or Considerations on the Navigation of the Schelde) from a letter by Mr. Chauvet, which gave him the first idea of the work.

'Having become acquainted with a geographer he began to think of writing a historical geography. Had any one shown him the elements of Chinese grammar, he would, I have no doubt, have attempted a treatise on the Chinese language. He studied a subject while he was writing upon it, and he only required an assistant who should furnish him with a collection of notes from twenty different hands; and had he been offered a good price, I am confident that he would have undertaken to write even an Encyclopaedia. His activity was prodigious. If he worked little himself, he worked a great deal. The artist of finding out men of talent, and of successfully flattering those who could be of use to him; he worked upon them by means of insinuations of friendship and of ideas of public benefit. His interesting and animated conversation was like a horn which he knows how to sharpen his tools. Nothing was lost to him; he collected with care anecdotes, conversations, and thoughts; appropriated to his own benefit the fruits of the reading and study of his friends; knew how to use the information thus acquired to advantage. His letters, which were written after he had begun a work in earnest, it was seen to make a rapid and daily progress.' (Dumont's Recollections of Mirabeau.)

The above sketch by a clever and impartial friend of the great statesman gives an insight into the versatile character of this remarkable man, who might be styled the Alcibiades of the French revolution.

In 1786, Mirabeau's abilities having become known, he was appointed to a commission to Berlin, where he spent about eight months, and witnessed the last days of the great Frederick, and the beginning of the reign of his weak successor. On his return to France he wrote his work 'De la Monarchie Prussonaise,' a work which was approved by those of his friends who had obtained a commission to Berlin. He also published an 'Histoire Secrète de la Cour de Berlin,' which contains many scandalous anecdotes, and which the French government caused to be burnt by the hand of the public executioner. He was paid twice for this work; once by the French minister at Moscow, for suppressing it, and a second time by the bookseller for publishing it.

It was about this time, in the latter part of 1786, that Mirabeau wrote his 'Address to the Batavians' on the disturbances then existing in Holland, and a 'Letter to Joseph L.'I., all of which are remarkable for their turbulent tone. He wrote likewise an 'Essai sur la Socét des Illuminés,' and a 'Lettre sur Cagliostro,' in which he exposed that impostor. His reputation as a writer stood very high, although he was indebted to Madame de Genlis for many of his materials.

The convocation of the States-General, in 1789, opened to Mirabeau a new and brilliant career. Two years before he had attended the assembly of the Notables, to which he was elected as secretary. He now presented himself before the States of Provence as a candidate for representing that province in the States-General, but he was rejected by the nobles on the ground of not being possessed of any title. The true reason was that he was disliked, not so much for his reforming conduct as for the bold attacks which he made upon the nobility.

He then offered himself as a candidate to the tiers et tiers, or Commons, and was returned to the States-General for both the towns of Aix and Marseille. He chose to sit for Aix. In the latter body of his constituents, he wrote 'Lettres a Chauvet,' in which he expressed his admiration and gratitude to the citizens who had given him this honour, and was received in triumph. In the midst of his success however he showed himself a friend to social order, and by his personal influence repressed the disorders of the populace, which had broken out in alarming riots both at Marseille and at Aix. It is Mirabeau's peculiar merit, that
throughout his political career; his passions and party feelings never got the better of his judgment; he always remained master of himself; he knew where to stop, and where others ought to have stopped. Whilst Brissot, Bar- nave, Siéyès, Pétion, and others had chiefly in view the temporary triumph of their respective parties or systems, he, on the contrary, labored to bring to light the inevitable consequences of the measures that were agitated, and he looked to the permanent welfare and security of France, and to the establishment of an orderly and rational government.

At the great assembly, among the two privileged orders and the third estate concerning their mode of sitting and of voting, Mirabeau opposed the motion of the Bénon members, that the third estate should assume the title of the National Assembly, regardless of the other two. The Assembly, however, did not invite the clergy to invite them, "in the name of the God of peace," to join the Commons. This step however proved fruitless. Siéyès proposed to send a last message to the privileged orders, to request them to repair to the common-hall of the estate, in order to verify their respective powers, and to judge as an default those who should not appear. That very day Mirabeau, foreseeing the consequences of the motion, requested an interview with Malouet, the personal friend of the clergy deputies. Malouet, a man of great power and influence, was the friend of rational liberty; he saw the storm which was impending, and that the question now was, whether the monarchy and the clergy should outlive its fury. 'There are,' said he, 'among ourselves (in the third estate) as great numbers of obsequious as of the aristocracy, the clerical and the aristocracy; the latter have no common sense, and among the fools I know several who are capable of setting fire to the gunpowder and blowing us all up in the air. You, sir, are the friend of M. Necker and of M. de Montmorin; for you see beyond our capabilities and our interest.' (Leçons de Mirabeau à un de ses amis en Allemagne.)

But the great step once taken by the Commons, Mirabeau was faithful to them, and boldly supported the rights which they had assumed, as the monarchies and estates-General as former ministers have dealt with those assemblies in the old times of the monarchy. That cannot now be. They ought to have a plan of conduct based upon certain principles for the interest of the state. If that plan is reasonable, I shall like me, but that is of no consequence, provided we can understand each other. I should wish to know their intentions, and I request a private conference with them. They would be very guilty or very stupid if they did not recognize the majority of the privileged orders as a nation. Mirabeau asked him, in a distant supercilious manner, what proposals he had to make? Mirabeau offended at the word 'proposals,' answered in a few sharp words and went away to the assembly. In passing by Malouet he whispered to him, 'You have not heard of the king, and by.' To the honour of Mirabeau it must be said this feeling of irritation was transient, and that in the momentous discussions that followed, his pique against the minister did not carry him beyond the bounds which he had previously prescribed to himself. (Droits de l'homme et du citoyen, 1789.)

On the 15th of June, when the Commons were deliberating on the name which they were to assume, Mirabeau, after observing that the majority of the privileged orders was ready to admit that the third estate was evidently in the right, and that for this reason they ought to avoid taking extreme measures, which are the last resource of despair, and whose certainly was not a desperate situation, continued that it was true that all the monarchical enemies of the state were not royalists, because that denomination implies three orders, and the three orders certainly are not here. Will you assume another synonymous denomination, implying that you are the representatives of the whole nation? You will still need, however, a majority, and you cannot do without the king, or you mean to impose liberty to your resolutions. He then proposed to assume the title of 'Representatives of the people.'

But in France the word 'people' had by long abuse become a word of contempt. The title of the Deputies deliberating in the absence of the minority duly invited and not appearing. But this title was too long. The discussion occupied four sittings. Siéyès, Bar- nave, and Camus denied the necessity of the royal sanction. 'As for me,' replied Mirabeau, 'I hold the king's sanction to be so indispensable, that if he had it not, I should prefer living at Constantinople rather than in France. I declare to you that nothing appears to me more fearful than the sovereign aristocracy of six hundred deputies, who to-morrow might take it into their heads to declare themselves permanent, the next day hereditary; and which would end, like all aristocracies in any country, by invading and destroying the independence of the state.' And he continued to support his proposed title of representatives of the people. 'Are you not the elect of the people? Do you blush at the name? Will you tell me to discard the name? You are assuredly confounded upon you, that it is not brilliant enough, not pompous enough for your taste? More clear-sighted than we, the heroes of the Netherlands adopted the name of guzex,' which the insouciance of their tyrants had cast upon their countrymen: the founders of Swiss liberty pronounced themselves in that of "boors," and these names, by rallying to their cause whole multitudes oppressed by aristocracy and despotism, became their strength and the pledge of their success. . . . Mirabeau's opinion however was violently opposed, and the denomination of 'National Assembly,' which had been sometimes used to designate the States-General, was adopted on the 17th of June, on the motion of Siéyès, the minority who voted against it consisting of 400 deputies. The question was thus decided on the question. He wrote to his friend Major Mauvillon of the Prussian service as follows: 'Supposing even that the king should give his sanction to the new title which we have assumed, it is still true that the deputies of the third estate are at a game of chess, in which I was wished to play at a game of chess in which I was the strongest. It is certain that the nation is not ripe. The excessive ignorance, the frightful disorders of the government have forced a hot-house revolution, and we are carried away by our impetuosity and our imprudence.' (Letters of Mirabeau à un de ses amis en Allemagne.)
It was then that Mirabeau, on the 8th of July, in an eloquent speech, denounced the measures of the court as a plot against the independence of the representatives of the nation, and moved a firm though respectful address to the king, whom he excused, as if unconscious of what was being done in his name, requesting him to remove the troops from the neighbourhood of the capital. The address was voted in the midst of acclamations. It has been said that this address, as well as many of Mirabeau’s speeches, was written from notes, but he had proved by his extemporaneous speeches and replies, which, as well as his prepared speeches, have the same form and pressure, the same logic, the same inspiration, and his own personal stamp, that caution and detail, as far as they were made use of notes with which his friends supplied him, but he had the art of making them his own, and stamping them with his original character. This is fully and honourably acknowledged in many places by Dumont himself, who claims (and we see no reason for withholding his statement) the greatest share in having written for Mirabeau.

Louis XVI. made an evasive answer to the address; the people of Paris took the alarm, which was increased by the sudden dismissal of Necker, and an inscription, led by Danton, Camille Desmoulins, Santerre, and others belonging to the club of the Palais Royal, broke out in the capital, which led to the destruction of the Bastille on the 13th of July. The next week saw the formation of the militia of Paris. During this stormy period Mirabeau was not, however, with the Assembly, day and night, at Versailles, supporting the firmness of the members, insisting on the necessity of the king withdrawing the troops from the capital, and sending reinforcements to the palace, but he was absent, having been left at last to consent to remove the troops, and went himself to Paris on the 17th, where he sanctioned the formation of the new municipality, the arming of the militia, and other popular measures. The Revolution was now complete, and the old monarchy was dead. It has been said that Mirabeau had conspired with the Paris insurgents, in order to make the duke of Orleans lieutenant-general of the kingdom; but this accusation, as referring to that epoch, was least premature. Mirabeau may have known or suspected the plot, or any part of the plot of the duchess of Orleans, but he also knew the weakness of the duke’s personal character, his bad reputation, and his want of popularity; whilst Louis was still very popular with the people at large. At a later period, on the 5th and 6th of October, when the populace of Paris went to Versailles, insulted the royal family, and threatened their lives, a plot was attributed to the duke of Orleans, and Mirabeau was implicated in the supposed conspiracy; but the National Assembly declared there was no ground for suspending either. Dumont, who lived at that time in Mirabeau’s intimacy, examines the matter pretty closely, and, in the end, leaves it in doubt. That some communications from the Royalists were made to Mirabeau through Laêches, the unprincipled author of the ‘Lettres Amoureuses,’ and that he was a familiar of the duke, seems certain; but the intentions of the conspirators, and how far Mirabeau participated in them, are still involved in mystery. Dumont seems to think that the object of the movement was to frighten the king away, and then to appoint the duke lieutenant-general of the kingdom, in case Mirabeau might have supported him in the Assembly, and have been appointed in return prime-minister, which post was the object of his ambition.

Mirabeau was one of the committee of five appointed to present the model of a declaration of the rights of man, on the motion of the metaphysician Silesy. Mirabeau was, from the first, opposed to this declaration, which he considered as a puerile fiction. He however sat about the task with his friends Dumont, Claviere, and Durovray; and there were, writing, disputing, adding, striking out, and exhausting both time and patience upon the model, which was published at last. At length of patchwork, our mosaic of pretended natural rights, which never existed. The principles intended to be established by this declaration are dangerous in themselves; for legislation is laid down to general propositions, which they are afterwards diluted and made to suit above all, they must not be cramped by false maxims. Men are born free and equal! That is not true; on the contrary, they are born in a state of weakness and necessary dependence. Equal! how are they so, or how can they be so? If by equality is understood equality of talents, of virtue, of industry, of fortune, then the falsehood is manifest. Mirabeau, on presenting the project to the Assembly, ventured to make the objections set out, and proposed to defer the declaration of rights until the constitution should be completed. ‘I can safely predict,’ said he, ‘that any declaration of rights anterior to the constitution will prove but the almanac of a single year!’ He therefore withdrew his power of weakness and disgust, and the declaration was decreed. (Dumont’s Recollections.)

During this discussion the violent members of the Breston club (afterwards the Jacobin club) charged Mirabeau with using the enemies of the country, advising them to vote in contradictory resolutions; and one of them, stooping to personalities, reproached him with the irregularities of his private life. Mirabeau answered, with dignified calmness, ‘No doubt that in the course of a stormy youth, partly the fault of others, but chiefly by myself, I have made many wrongs, and that there are few men who have afforded more matter for bad report and more pretext for slander; but I dare attest to you all, that as a public man, as a political writer or speaker, no one can boast of greater courage, independence, disinterestedness, or moral and consistent principles. Thirty volumes of writings are there to prove my assertion.’

Then came the famous night sitting of the 4th of August, in which a resolution was adopted to create a body of nobles of the nobility and clergy, abolished feudal rights, general laws, tithes, privileges, and indemnities, pensions not for actual services, the corporations of traders, and all the provincial franchises, states, and assemblies, as well as the charters of towns and cities, and the edicts of the old regime. The motion and opposition were decided in a few hours, but it was passed, and passed by general acclamation. From this sitting Mirabeau, Sisley, and other leading members happened to be absent. The following day the first two strongly reproached this hasty work. Sisley made a speech against the abolition of the tithes, which he ended by the words, ‘They want to be free, and know not how to be just.’ Mirabeau exclaimed to Dumont, ‘This is just the character of our Frenchmen; they are three months disputing about syllables, and in a single night, overturn the whole venerable edifice of the monarchy.’

The next important discussion was that on the king’s veto. Mirabeau had determined to support the absolute veto, which, in the absence of both or of either, he considered of vital importance to the government. His speeches on the occasion excited much surprise and dissatisfaction among the deputies. Sisley opposed the absolute veto, and Barnave and Péron proposed a suspensive or temporary veto, as a compromise. The question, however, was decided on that occasion; and such was the importance which even his antagonists attached to his name, that Camille Desmoulins and other democrats boldly asserted that he had voted in their favour. Mirabeau’s speech on the national bankruptcy was to have a complete triumph. In this speech he supported the minister Necker, to whom he was personally hostile, in his plan of a forced loan to make up the deficit in the revenue. Several members had proposed modifications, which Mirabeau thought would destroy the effect of the measure. He proceeded to remark upon the dangerous state of the public credit, the failure of the revenue, and represented a national bankruptcy, with all its horrors, as the probable consequence of the ruin of the plan. The member so commonplace a subject was miraculous: he elevated it to sublimity. They who heard that speech never forgot it. No attempt was made to reply: the assembly was subjugated by the power of a superior mind, and the project was voted unanimously. As Mirabeau was considered as having no rival in the assembly, there were indeed other orators, but he alone was eloquent; and this impression was stronger, because in his speech he put the question so finally and obliquely. ‘To have depended entirely upon his own resources; for it was an urgent measure, and not therefore have been prepared.’ (Dumont’s Recollections.) Molière, the celebrated actor at the Théâtre Francais, was so struck with the force of Mirabeau’s eloquence and style, that he wrote for him a comedy, called ‘The English with a French Twist,’ written with vivid emotion, ‘Ah! monsieur je crois, said he, in a pathetic tone of voice, ‘what a speech! and with what an accent did you deliver it? You have surely mused your
vacation.' Mirabeau was by no means disapproved at this singular compliment.

After the removal of the assembly to Paris, some negotiations were entered into for bringing Mirabeau into office. Necker had nearly agreed to it, and the king was about to consent; but the opposition obtained, the same objections that held him member of the assembly, without which he felt that his taking office would be of no use. Suspicion of the scheme having been bruited about, some of his antagonists, of Lameth's party, moved that no minister should be a member of the assembly: and the motion was carried, which was carried by a feeble majority. He appealed to the usage of the English parliament, but this appeal told against himself; for the least idea of imitation offended the pride of the innovators, who pretended to establish a monarchical government, renouncing the single element of monarchy. 'We are not English, and we want nothing English,' was the reply on such occasions.

Mirabeau was one of the first to propose a martial law to put down the insurrections which had then become extremely frequent all over France. The law was passed on the 19th of October, notwithstanding violent opposition; and, strange to say, Mirabeau's popularity was not affected by it.

About November of the same year Mirabeau unexpectedly communicated to Dumont a plan to draw the king away from Paris. After placing him in Metz or some other strong fortress, amidst faithful troops, he was to appeal to the people by proclamation, to dissolve the assembly, and order Mirabeau to be put to death. It was the practice of Mirabeau to remain at Paris, and watch the motions of the assembly; and, as soon as the royal proclamation should appear, he expected to induce all the moderate members to separate from the rest and follow the king. Mirabeau represented this plan to Dumont in his letter, and he was, we are informed, quite ready to follow his advice from complete disorganisation. Dumont strongly remonstrated against the plan, and Mirabeau acknowledged to him that it had originated with the court party, and that he had intended to co-operate in the movement, in order to direct it. The king, 'if he were to act,' he added, 'would only lead to new errors and the total ruin of the country. If the plan does not succeed, the monarchy is lost.' Mirabeau represented to him that he would most probably be made use of in favour of the cause, considered as a victim. A few days afterwards Mirabeau told him that the plan was given up, and the affair remained a secret.

During the year 1790, Mirabeau continued to hold the first rank as a leader of the National Assembly. He supported the economic measures which aimed at paying off the national debt, but with some restrictions in favour of the actual possessors, which restrictions were however disregarded. He also supported the issue of so-called bonds, to secure the safety of the property in order to pay off the national debt. At the same time, according to Dumont's suggestion, a plan of gradual elections, by which a citizen should have to exercise certain civil functions for a stated period in order to qualify him to become a deputy to the legislature. This motion was at first received with favour by most members both of the right and left sections of the assembly, but Lameth, Barnave, and some others looked upon it as an aristocratic snare; they moved and carried an adjournment, and the motion was ultimately lost.

In the important discussion on the right of peace and war, he declared, to the great dismay of the democrats, that the king ought to be invested with this prerogative, and supported his opinion by a logical and brilliant speech. Barnave opposed him, attacked Mirabeau violently, accused him of being in favour of the right of war as the left side, and by the people in the galleries, and received with acclamations by the people out of doors, whilst cries of 'à la lanterne' resounded against Mirabeau. The debate was adjourned. The next day a libel was hawked about the town that the day previous the deputy 'de treason of the Count de Mirabeau,' in which he was accused of bribery. The paper was shown to him as he entered the assembly; he glanced at it, and said, 'I know it as, I shall leave the house either triumphant or in pills.' He ascended the tribune amidst the most profound silence: 'For several days past,' said he, 'the section of this assembly which wishes for the king's assent in questions of peace and war is represented as hostile to public liberty; rumours of treason and corruption are artfully spread abroad; popular vengeance is invoked to support the tyranny of party opinions. I also, within a few days ago, was ordered to carry in triumph, I heard myself now proclaimed in the streets as a great conspirator. I did not require this lesson to remind me that there are only a few steps between the capitol and the Tarpeian rock; but a man who wishes to be useful to his country, who cares little for the vain celebrity of a day, is not easily overcome by a conjuration given him by the ruffians who multiply and from time, the incorruptible judges of us all. I shall therefore resume the question in debate, and explain the true point of contention with all the clearness I am capable of.' He then reported a address of Barnave, which Mantoux set a question to, and said that M. Barnave has not at all touched the question at issue. It would now be for me a task too easy and irrelevant to follow my opponent throughout his accessory details, in which, if he has shown a certain talent, he has not exhibited the least knowledge of state or worldly affairs. He has declared at length about the mischief which absolute kings can do and have done, but he has not observed that in our constitution the monarch is no longer absolute, and cannot act arbitrarily, and he has, above all, completely abstained from remarking the evil of all the measures against emigration, saying that it was tyrannical to interfere with the locomotive faculties of individuals—that such restrictions could not be carried into effect—that he, for one, would not obey them—and as the extreme left became louder and loftier in their manifestations of their protest, he fixed his eyes upon them imperiously, and cried out with a voice of thunder, 'Silence aux trente voix!' (silence, you thirty votes); and the extreme left quelled before him, and was silent according to his order.

On the question of the regency he told the assembly to judge for themselves, and not to heed the shouts out of doors; he told them that the very people who were applauding them to-day would shout still louder were they to see them some other day on their way to the scaffold; and at that moment a loud cheer from the galleries seemed to confirm Mirabeau's prediction.

Thus did this extraordinary man, while crushing the old aristocracy with one hand, repress the fury of the democrats with the other. His pious zeal was not only disingenuous in his conceptions of the intellect, but he seemed to attempt for the intellectual capacity of most of his colleagues, he still kept them all in awe; and while openly asserting his independence of clubs, and factions, and mobs, he retained his popularity to the last even with the lowest popular faction.

'Our little mother Mirabeau!' was the endearing nickname which the fishwives of Paris, who sometimes graced the galleries of the legislature with their presence, applied to him.

Mirabeau, assisted by Dumont and others, edited a journal entitled at first, 'Journal des Etats-Généraux,' and afterwards 'Courrier de Provence,' which gave a clever and tolerably impartial report of the proceedings of the National Assembly, until about the middle of 1786, when it was forsaken by its original founders, and retained nothing of its former character except the name.

In January, 1791, Mirabeau was named president of the National Assembly. Never had this office been so well filled. In his sway, it was in truth a National Assembly. He introduced a degree of order and clearness in the proceedings, of the possibility of which no member had previously the least conception. He simplified forms; he could render the question clear by a single word, and were to order by a single word the tribune to be closed. He always paid to the Assembly, the precision of his observations, and his answers to the several deputations at the bar, answers which, whether prepared or extemporized, were always remarkable for their elegance, and capable of while conveying a refusal; in short, his activity, his impartiality, and his presence of mind increased his reputation and added splendour to his talents, in an office which had proved a quicksand to several of his predecessors. He had the art of fixing the general attention even when, being no longer able to speak from the tribune, he seemed to have
foregone his most valuable prerogative. His enemies, who were jealous of his eloquence, and had voted him president in the National Assembly, were bitterly disappointed when they saw him add another wreath to the chaplet of his glory.

"He was far from enjoying good health at this time. "If I breathe in slow motion," he said to me, "I should think myself poisoned; for I feel that I am dying by inches—that I am being consumed in a slow fire." I observed to him, that his mode of life would long ago have destroyed any man less robust than himself. Not a moment of rest, from seven in the morning till ten or eleven at night; continual conversations and altercations; agitation of mind and excitement of every kind; too high living, at least as regards food—for he was very moderate in drink. "You must," I said, "be a salamander, to live in the fire which is consumed."

"I am surrounded by the çalıştı and apprehension and moments of ennui and fatigue," he exclaimed at times, "of retiring from public life. The irritation of his system at this time produced violent attacks of ophthalmitis; and I have watched him, whilst he was president of the National Assembly, sometimes apply leeches for his eyes in the interval of the adjournment of the sitting from the morning to the evening, and attend the Assembly with his neck covered with linen to staunch the blood.

When the last session (which was going to Geneva for six months), he embraced me with an emotion which I had never before seen him evince. "I shall die at the stake, my dear friend," said he, "and we shall never perhaps meet again. When I am gone, my value will be the expression of my country's misfortunes."

"I have a fire for the present were overwhelming France in every direction; but that base faction, which I now overawe (the Jacobins), will again be let loose upon the country. I have no friend; if I had another, I should make a stop for the present were overwhelming France in every direction; but that base faction, which I now overawe (the Jacobins), will again be let loose upon the country. I have none, my dear friend."

"You are right," he replied, "but then, the Commons, from being declared a National Assembly. That was the origin of the evil. Since they have carried that point, they have not ceased to show that they are unworthy of the trust reposed in them, and that they are being governed by him; but soon neither they nor he will govern; a vile faction will rule the country, and debase it by the most atrocious crimes." Three months after this conversation Mirabeau was no more." (Dumont's Recollections of Mirabeau.)

Mirabeau died on the 2nd April, 1791, of a short but violent disease, the result of his mode of living and of continual excitement. During his illness he suffered much, but endured his pain with sufficient calmness and resignation. He repeated to Talleyrand, who attended him, the same gloomy prognostications on the result of the actual struggle in France which he had before expressed to Dumont, and his determination, had life been spared to him, of supporting the constitution, as an instrument of safety against the dangers of the anarchists. "I carry with me to the grave," said he once, "the last shreds of the monarchy."

He had been for some months in correspondence with the court, and had proposed a plan for dissolving the Assembly by the force and will of the nation itself, by getting up addresses from the departments, without having recourse to foreign armies or destroying the people's hope of freedom; for a new assembly was to be convoked forthwith, which would have revised the constitution. Mirabeau never intended to restore absolute power: he wanted so well that he would have destroyed himself by such a measure; but all his ambition during the latter period of his life was centred in the idea of becoming prime minister of the constitutional monarchy of France, and he thought, that once in that office, he should eclipse every minister who had preceded him, and that he would attract within the sphere of his patronage all men of distinguished abilities, and thus form a halo of talents whose brightness should dazzle Europe. (Dumont, Bouillé's Memoirs.)

Cabanis, a young physician, published an account of Mirabeau's illness and a copy of his will. He died unembowered with debts. "Much has been said of the venality of Mirabeau," says Dumont, "as if he, Bouillé, were the author of this last book: but this is an exaggeration. It may be admitted that he was not over-scrupulous in money matters, but he was too proud to be dishonest; and he would have thrown through the door every one who dared to make him a humiliating proposal. At this time he corresponded with Monsieur (afterwards Louis XVIII.), and subsequently, during the last six months of his life, one from the king: he considered himself as an agent entrusted with their affairs, and he behaved as such; and he was rewarded by, but to govern and direct those who granted them."

Mirabeau was a brilliant orator, and a fluent though not original writer. The great characteristic of his genius consisted in his political sagacity, his anticipation of events, and his knowledge of mankind. No man at the time, at least in France, saw so far as he did into futurity, and his forebodings of impending calamities were attributed to disappointed ambition. But while he predicted the downfall of monarchism, and his home was actually detected by his instinctive penetration the feelings of the principal members of the National Assembly, and often embarrased his opponents by revealing their secret motives, and laying open that they were most anxious to conceal. The character of his judgments has been justified by succeeding events; and there has not been a man of any consequence in that assembly the sum of whose conduct has not corresponded with the opinion which Mirabeau had formed of him. His death gave to all the political party a rallying ground for the suspicion of poison: his funeral was conducted with great pomp; all the theatres were closed, the deputies, the ministers, all the public authorities, and a great number of other persons, forming a procession of more than two miles in length, followed his remains to the Panthéon, where they were deposited among the illustrious dead.

Little more than two years after, in November, 1793, the body of Mirabeau was disinterred by a decree of the Convention, and deposed. The fœtus, and the inanimate remains of Mirabeau succeeded to his honors. So short is the period of popularity in revolutions.

Mirabeau left a natural son, whom he adopted before his death, and who has published memoirs of his father, in 4 vols. 8vo, London, 1833. Besides the numerous works and pamphlets of Mirabeau which were printed in his lifetime, several collections have been published since his death:—Collection complète des Travaux de Mirabeau à l'Assemblée Nationale, Paris, 1791;Oubres Oraintes et Choisses de Mirabeau, 6 vo 8vo, Paris, 1821.

Mirabeau was tall, thick-set, and naturally robust, but very plain in his features; and yet, when he chose, his manner was extremely fascinating. His large head was bounded by his hair, which was thick and black, and grew pains to cultivate; and he used to say, when his antagonists were troublesome, that he would shake his locks at them, at the same time assuming a threatening look, which, added to his deep powerful voice, had the effect of completely silencing them.

As the history of Mirabeau's political life is closely connected with that of the States-General, and of the National Assembly, which grew out of them, and which affected the French revolution, it may be proper here to give an account of the formation of the States-General.

The States-General were an old institution of the French monarchy. They were at first composed of the deputies of the two orders of the nobility and clergy, and were convened by the king, in a public assembly, to hear the public cases and also to furnish the monarch with money by the so-called free gifts. It was a feudal institution, like the early Spanish Cortes and English parliaments. Afterwards the deputies of the chartered towns were admitted into the assembly, and the term of the sessions was called the National Estate. It would appear that the third estate, or commons, were first introduced into the states-general under Philip le Bel in 1303, on the occasion of the quarrel between that monarch and the archbishop of Reims. It was about a century later than the introduction of the rights of the shire into the parliament of England.

There were in France provincial states also, consisting of the three orders, in Provence, Brittany, Burgundy, and the other great duchies of the crown; the provinces were accordingly distinguished, by the appellation of Tages d'État,
from the other provinces directly subject to the crown, which were called "Pays d'Election." In the Pays d'États, the states of each province were asked by the king for a certain subsidy, for which they voted the supply, and regulated the assessment of it, the nobility and clergy paying according to the value of the lands which they owned, and this was called the real taille; the merchants, artificers, and tradespeople were assessed according to their wealth and station, which was called the personal taille; but day-labourers and the monarchy were included in the personal taille. The Pays d'Élection were taxed at will by the king; and the tax called personal taille was assessed upon all the inhabitants by the "États," or notables, of the respective communes. In this as well as in other respects the countries without parlement of the province of the Pays d'États contained also a principle or tradition of the monarchy at large that no permanent tax could be levied or maintained throughout the kingdom without the consent of the states-general of all France. There seems to have been no fixed period for the convocation of the states-general: it depended on the humour and necessities of the reigning king. But when they met, they were considered as representing the nation, and as being above all courts of justice and other authorities, and equal to the king himself. On the king's letter or call letters giving the weights of the vote for each order were elected by the bailiffage, or districts, from each of the three orders. When assembled, each order had its separate chamber or hall for deliberating, and the majorities which dissolved itself in the 30th of May. The whole assembly therefore may be considered as having three votes, and it may be easily inferred that in questions on which both the nobility and clergy had the same interest, the vote of the third estate was of no avail. But there were other cases, and amongst the financial questions, the vote of the third estate would prove decisive. When the king came to communicate anything to the states, the three orders assembled in one common hall. This was called a royal sitting, and after the king's departure each order retired to its proper chamber. It was resolved on several occasions, and particularly at Orleans, in 1659, that the agreement to deliberate together as one assembly, and choose one president for the whole. The last states-general assembled in France previous to 1789 were convoked under Louis XIII, then just of age, in 1614. They asked for the abolition of certain taxes and duties, which the minister promised, but did not keep his word. The following ministers, Richelieu and Mazarin, at Louis XIV's command, disposed of the powers of national representation of any sort, and the states-general became almost forgotten. The disorder of the finances and the refusal of the privileged orders to come to the assistance of the exchequer, added to the remonstrances of the common people, forced, or that for which it is impossible to say, but Necker, decided Louis XVI, to assemble once more the states-general: but the difficulty was to determine the mode of election, about which there was nothing certain or unified opinion by others, or mistake or misapprehension on his own part. When a man derives his knowledge of an event from the information of others, there is, in addition to the causes of error which may exist where he is an eye-witness, the further cause of error which may arise from the witness whose evidence he is receiving interested in deceiving him, or being, from whatever cause, disposed to deceive him. There is no supposable event which may not be the subject of evidence; and when all reason for supposing deception, mistake, or intention on the part of the witness is excluded, there is no reason to suppose otherwise than that, when witnessed, does not thereby acquire some degree of probability. It must be admitted that the ascertaining that there is neither deception, mistake, nor intention to deceive, is generally the main matter in the estimation of the evidence; the estimating the value of the evidence in any given case is a different thing from determining what may be the subject of evidence, which is the matter that we are here considering. A man is so constituted, that any event alleged to have taken place is at once placed by the mind either among events which are common or among events which are uncommon. In the former case, before any evidence is furnished us to the fact, the presumption of its occurrence is even the soundest judge of human events, though he will believe no alleged event without sufficient evidence, readily acquiesces in the probability of an alleged

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event of a common kind being a true event. In the case of an uncommon event, the matter is different; most persons, on considering it, will admit that the uncommon event has actually taken place, and many persons at once assume its impossibility, or at least assume that it has not taken place. But there is no rational ground either for admitting the truth of an uncommon event or for refusing assent to an uncommon event supported by sufficient evidence. An event the most common in the course of human life, an event the probability and possibility of which no man will deny, requires as much evidence in its support as any event the most uncommon, any kind of thing or event that has never been heard of before. In both cases, the testimony of one eye-witness at least is required; and supposing the absence of mendacity in the witness and of all reason for supposing him to be dishonest, the uncommon event is proved as much as the common event. How much and what will be necessary in either case to show the absence of mendacity or of deception, is a question that concerns the estimation of the value of the evidence in any given case, and cannot be determined generally.

Thus it appears that an event alleged to have taken place may either be one of a kind that is consistent with a person's experience, or it may be inconsistent with it. But the testimony of an eye-witness of which the only evidence lessens the probability of the event to be believed, may be precisely the same in degree and kind: it may be the evidence of persons of integrity unimpeached, of judgment approved, and of observation and acuteness unquestioned.

In either of the two cases supposed, the evidence is precisely the same: the only difference is in the mental state of the person to whom it is addressed. All intention or disposition to deceive, on the part of the witnesses, is by the supposition out of the way, and therefore the effect of the testimony is reduced to that of the reception of the evidence being an eye-witness, and if he believes the witnesses to have as much penetration and judgment as himself, their evidence is as good to him as his own experience would have been; and if he thinks the witnesses have more penetration and judgment than himself, it is better. There is then no reason why a man should not, under the circumstances supposed, believe an event which is inconsistent with his own experience, as well as one that is consistent with it.

The true cause of all the dispute about the reality of events called miraculous is this: the estimation of the evidence in the particular instance, or instances, has been confounded with the question of evidence generally. As a matter of evidence, any fact may be alleged as the fact to have happened, which is to be supported by the fact of the proof derivable from a man's own observation cannot be denied. But whether any alleged fact has been proved or not, is quite a different question. It is not here said that any supposed fact or event is proved beyond all doubt; but it is said that the fact or event was possible, by possibility, being supported by evidence as strong as that arising from a man being an eye-witness.

The assertion that any alleged event is inconsistent with experience, may mean either the experience of the objector, or the evidence (that is, the experience) of others; or it may mean both. Taken in its widest acception, the assertion cannot be properly made of any fact or event alleged to have taken place; for by the supposition, the event is consistent with the experience of the person who bears evidence to it. If a fact or an event should be told to a person, of which there was no similar event on record, it might be said that experience did not show any similar event; but though this shows that there has been no similar event on record, it does not authorize the assertion that there was not a reason at all against evidence in support of it which is free from all the objections above enumerated.

But it may be said, what does this lead to? It leads to the consequence that any alleged fact or event is possible; and it leads to the proper examination of the evidence by which it is supported. Suppose the event to be a shower of stones recorded in Livy. The investigation is relieved of one difficulty by the fact of showers of stones being not testified by evidence in modern times much more satisfactory than that of Livy. A man may therefore commence such inquiry by admitting that the particular circumstance recorded by Livy may have taken place; though, *no* had made satisfactory evidence of such a kind of events taken place before, he could not commence his inquiry by making such admission; for the admission that such an event might have taken place when the witnesses have not proved to have taken place, and would then be useless. Further; prior to receiving any evidence, we cannot say that the event is one that could not have taken place. Whether a shower of stones, as recorded by Livy, did fall or not, depends of exactly on the same principles as other events recorded by him.

Now many of the facts or events which are called miracles are of the kind which may be considered as unlike any other events on record; the fact, for example, of Jesus raising Lazarus from the dead, is different in its present purpose, to be the first event of the kind on record. With reference to an event of this kind, Hume remarks, 'In order to increase the probability against the testimony of witnesses, let us suppose that the fact which they affirm, instead of depending on God and upon the testimony of his agent, suppose also that the testimony, considered apart, and in itself, amounts to an entire proof; in that case, there is proof against proof, of which the strongest must prevail, but the diminution of its force in proportion to its antagonist.' The opposing proof here referred to is that which Hume calls experience, a word which he has used in his Essay in a very loose sense. From what has been said in this article, it will be perceived that the view which he advocates restricts the word 'experience' to the evidence derived from that of Hume. If the 'testimony, considered apart and in itself, amounts to an entire proof,' the thing or event is proved, whether it be one kind of thing or another; and this conclusion is logically contained in Hume's words. It is not a matter of degree or degree in which we are more or less secure; it is a matter to which it is to be applied. (Starkie, *On Evidence*, i., p. 473, note.) * This is the case in the first part of Hume's 'Essay on Miracles,' the second part merely professes to show that no miraculous event has ever been established on so full evidence as may amount to entire proof.

Every person understands what is meant by the laws of nature. The material world and the world of thought are subjected to certain general laws, or, to speak more accurately, the phenomena succeed one another in a certain order, which, as far as evidence extends backward, has been generally unaltered. We say, generally, for deviations from this order are alleged to have occurred at various times and in various places. Now deviations from those laws are supposed to depend upon the violence of some particular event, and that the belief of many persons, and which are regarded by others as totally untrue. Some have gone so far as to say that such events are impossible; thereby destroying the very ground of all evidence, for we can never determine before-hand whether an event has been proved or not, unless the thing asserted and proposed to be proved should be a general proposition, and a man should be able by his own experience to contradict it in one or more particular instances: in such case, a man might before-hand deny the thing proposed to be proved. This is in fact Tillotson's argument against the real presence, which Hume 'flattered himself' was of 'a like nature' with the argument that he 'had discovered.'

Hume's definition of a miracle, at least the first part of it, appears unobjectionable: it is defined by him to be 'a transgression of a law by a natural volition of the Deity, or by the interposition of some invisible agent.' The true notion of a miraculous event then is an event that was not consistent with the manner in which it was known at the time when the event is alleged to have taken place, and would be inconsistent with it if it were to take place now; and further, it must be such an event as by the supposition of its occurrence cannot take place by virtue of the laws of nature as established. For if an event happens by virtue of what is called a law of nature, known or unknown, it is not a miracle as the term is properly understood.

If the raising of Lazarus from the dead was an event which took place by virtue of a pre-established law or course of events, in which this one event, to us an apparent exception, was in fact a necessary consequence of this pre-e
published law or course of events, such event is not a miracle, nor such an event as is generally understood by the word miraculous. Those then who would bristle miracles within what are called the laws of nature, mistake the question. If the event of the raising of Lazarus from the dead, and all the attendant circumstances, took place in the course of things, agreeably to a general law unknown to us, such an event is as much an event consistent with what are called the laws of nature, as the event of any man's death; but in that case, it is not the kind of event which the 'New Testament' presents to us. Whether however it is the one kind of event or the other, matters not as to the evidence of. nature. One is also so concerned about the kind or quality of the event.

To take then the case of a man being raised from the dead; can the evidence of such a fact amount to proof? It can amount to proof as strong as that which a man would bear from being an eye-witness of such an event, and having every opportunity of examining it. Whether, in a given instance, the proof is so strong as this, must be ascertained by weighing the evidence, which is quite a different matter. A man must always decide for himself whether he will trust his own senses, so he must also decide whether he can believe that which a credible witness says that he has seen.

There is still another view of the kind of events called miracles which is not easy to get the better of Hume's sceptical argument, if we admit his definition of a miracle. Brown affirms that a miracle is not a violation of a law of nature, but a new consequence from a new antecedent, the new antecedent being the event which is called a miracle, and a man must always decide for himself whether he will trust his own senses, so he must also decide whether he can believe that which a credible witness says that he has seen.

In a miracle it is the divine will that, preceding it immediately, is the cause of the extraordinary effect which we term miraculous, and whatever may be the reason for the event, it is the will of nature. The course of nature is as little violated by it as it was violated by the electrician who for the first time drew lightning from the clouds. It is sufficient to observe, that as Hume's definition of a miracle admits the existence of the deity, that which he calls a transgression of a law of nature by a particular volition of the deity can be nothing more than a variation by the will of the deity in the phenomena of nature as known to man by his own experience and the evidence of others. Hume's definition then of a miracle does not include those bounds to the will of nature which Brown, while he calls the thing a miracle, denies that it is a violation of the law of nature; and also includes among miracles those events which, whether called miracles or not, are not the same kind of events which Hume and theologians generally mean by miracles. The effects of nature cannot, consistently with Hume's definition, be anything except a certain order in the phenomena which the deity has permitted and permits to take place, and which by the terms of the definition he can vary as and when he pleases, in this sense; and with reference to the deity, no event can be said to be a violation or transgression of a law of nature, such terms being totally inapplicable to the will of the deity. But inasmuch as the sequence of the events on the coast of the desert is regular and regular, any interruption or transgression of such sequence may, with reference to man, be called a violation or transgression of a law of nature, with perfect consistency of language; and by such violation or transgression, which may be further broken and consistent with precision, than something which is contradictory to the course of nature as known to man, and not something, as electricity for instance, of which man, up to the time of the proper experiments being instituted, merely had no knowledge. Whether such an event may not, according to the amount of 'the extraordinary effect which we call miraculous,' can vary the event itself, which, by whatever name it is called, remains the same event, simply considered as an event, and is to be proved by precisely the same evidence.

Much has been written on the subject of miracles, both in connection with the general principles of evidence, and by some who deny the Hume's theory. Though a great deal of it is of little value, it is generally worth referring to by those who are desirous of forming clear notions on the subject of evidence.

(Rutherford, Discourse on Miracles, 8vo, 1751; Credibility of Miracles defended, 8vo, 1751; Adams, An Enquiry to Hume on Miracles, 8vo, 1754; Campbell, Dissertation on Miracles, in Anseuir to Hume, 8vo, 1762; Bishop Douglas, Criticism, &c., 8vo, 4th ed., 1832; Locke's Posthumous Works, 'Discourse of Miracles'; Bishop Conybeare, On the Nature of Miracles, Possibility of Miracles, 2 vols. 8vo, 1834; Chubb, 'Discourse on Miracles,' in his Miscellaneous Works; Lardner's Credibility; Middleton, Free Enquiry; Paley's Evidence of Christianity; Price, On the Nature of Miracles; Woolston, Six Discourses on the Miracles of Our Saviour, &c., 8vo, 1730; Ray, Christ's Miracles vindicated, 8vo, 1751; Bentham, Rationale of Judicial Evidence; Brown's Inquiry into the Relation of Cause and Effect.)

The above-mentioned works will furnish references to other works of which mention has been made.

MIRAGE. This word, which is French, has been received into our language. It is the name given to a phenomenon of unusual refraction, for which we have no specific appellation unless it be the sea term 'lomning.' As a general definition we may say that it is the illusion occasioned by the refraction of light through contiguous masses of air of different density, such refraction not unfrequently producing the same sensible effect as direct reflection.

The illusion of the mirage differs according to circumstances, but they may all be arranged under one or other of the three following classes—vertical reflection, horizontal or lateral reflection, and suspension.

In the vertical reflection the mirage presents the appearance of a sheet of water on which objects are reflected, and of course reversed as they would be in a lake. It is this kind which is observed in Egypt, and which so cruelly tantalised the parched throats of the French soldiers during the campaign of 1799. It was even in that country, and in that particular kind of mirage, that the term has been derived from the Arabic word analogous to that which has given it to our language. The effect of this kind of mirage is thus described by Monge, one of the savans who accompanied the army. The soil of lower Egypt is a vast plain perfectly horizontal; its uniformity is interrupted only by a few eminences on which, in order to secure them from the inundations of the Nile, the villages are built. In the morning and evening the aspect of the country presents nothing remarkable, all objects appearing in their natural positions and at their proper distances; but after the soil has become heated by the presence of the sun, the prospect of the Zenana in the distance often seems to take on the appearance of an island. Beyond appear as islands in the midst of a great lake. Under each village its inverted image is seen as it would be if reflected from the surface of a sheet of water. On approaching however, these deceptive images and the reflected image vanishes, to be succeeded by another as some more distant object comes in sight.

This kind of mirage is not peculiar to Egypt; it is known in Persia also, where it is called Sarad or Sir-ab (miraculous water); and it is seen by those who cross the western deserts of India, where it is known by the name of Tschittaram (picture). Neither is it exclusively confined to inland countries nor low lands. Biot has observed it over the sandy beach of Dunkirk, and it is not unfrequently along the sandy coast of the Sea of England. The writer of this article has seen it at the Cape of Good Hope. Captain Mundy states, that he observed an effect of the mirage at the Shalbott Pass in India. A deep precipitous valley below us, says he, at the bottom of which I had seen one or two miserable villages in the morning, bore in the evening a complete resemblance to a beautiful lake. The vapour, which played at the water's edge, ascending nearly half-way up the sides of the vale, and on its bright surface trees and rocks distinctly reflected.

In the horizontal or lateral reflections the mirage presents the reflected image sideways. Thus, on the 17th of September, 1818, Messrs. Jurine and Sorel observed a lateral mirage on the lake of Geneva. A bank of snow, some distance distant, was seen approached by Geneva by the left bank of the lake, and at the same moment there was seen above the water an image of the sails, which, in place of following the direction of the bank, receded from it, and seemed to approach Geneva by the right bank of the lake, the image
sailing from east to west, while the bark was sailing from north to south. This lateral mirage is known to the inhabitants of Mogro, who call it Schäld (castle of the cold season); and by such as live in the plains watered by the Chumbul and the Jumna, where it is termed Dissauer (prognostic).

Colonel Todd mentions having witnessed this kind of mirage at Jaypore, Ratiball, and Hassar. He describes it as a high dark wall bounding the plain, which, as soon as the sun’s rays break in upon it, presents various fantastic forms of ruins, such as we may imagine from his description, may be easily explained by the natural designs in what is called Filontore marble. Its appearance is so wonderful as to cause the Colonel to present it to my view the fort and bastions of Agra, distant thirteen miles. The natives of Hassar call it Hertchendroja ka pouri (the city of the royal Hallendhu), a celebrated prince of the brazen age of Hindustan.

In like manner Dr. Vince, on the 6th August, 1866, at 7 p.m., saw the whole of Dover Castle brought over and placed as if on a stage side of a hill situated between the two places and he adds, the image was so strong, that the hill itself could not be seen through it. The French coast is sometimes brought almost in contact with our own by the illusion of the lateral mirage. Thus, on the 26th July, 1863, at 6 p.m., Mr. Latham saw the French coast, which is about 40-50 miles as the crow flies, as distinctly as through the best glasses. The sailors and fishermen could not at first be persuaded of the reality of the appearance; but as the cliffs gradually appeared more elevated, the illusion was confirmed, and on landing at the appointed place they had been accustomed to visit, such as the bay, the windmill at Boulogne, St. Valery and other places on the coast of Picardy. All these places appeared to them as though they were all smaller, and the harbours from the eastern cliffs Mr. Latham saw at once Dungeness, Dover Cliffs, and the French coast all the way from Calais, Boulogne, on to St. Valery, and, as some of the fishermen affirmed, as far as Dieppe. The day was extremely clear, with a thick sheet of clouds, and objects at some distance appeared greatly magnified.

In particular situations both the vertical and lateral mirage may be observed together. Thus the late Mr. Black-ad has described some phenomena of both vertical and lateral mirage, as seen at King George’s Battery, Leith, which are very instructive. The extensive bulwark, of which this bastion forms the central part, is formed of huge blocks of hewn sandstone, and from this to the eastern end there is a perpendicular descent. To the south the bulwark is extended in a straight line to the distance of 500 feet. It is eight feet high towards the land, with a footway about two feet broad and three feet from the ground. The parapet is three feet wide at top, and is slightly inclined towards the sea.

When the weather is favourable, the top of the parapet resembles a mirror, or rather a sheet of ice; and if in this state another person stands on it also, but at some distance, with his face turned towards the sea, his image will appear opposite to him, giving the appearance of two persons talking to or saluting each other. If again, when standing on the footway and looking in a direction from the tower, another person crosses from the eastern extremity of the bulwark, passing through the foot-way either to or from the sea, there will be the appearance of two persons moving in opposite directions, constituting what has been termed a lateral mirage: first, one is seen moving past, and then the other in an opposite direction, with some interval between them. In less creditable parapets, objects are also seen variously modified, the mountains in Fife being converted into immense bridges; and on going to the eastward extremity of the bulwark and directing the eye towards the tower, the latter appears curiously modified, part of it being, as it were, cut out, and another portion and its inverted image at some distance towards the sea. At other times it bears an exact resemblance to an antient altar, the fire of which seems to burn with great intensity.

The phenomenon called suspension, which is the third kind of mirage, and is that to which the term looming is most strictly applied, is the picturing of an object immediately over it in the air, freely without reversal of the image. Sometimes the objects are merely raised above the height at which, under ordinary circumstances, they would appear. Thus Sir R. K. Porter mentions a phenomenon of suspension or looming in the plains near Bagdah. A little before morning," he says, "I observed an elevated stream of water, which, from its situation, must be the Tigris. Its surface was brilliantly illuminated by the moon, but the longer I kept my eye fixed on this noble river of many islands, the more my surprise became excited at the extraordinary manner in which these water streams, all of 10 feet or more in depth, till at length I began to suspect that some optical illusion from refraction was assisting the apparent elevation of the stream; but I had not conceived the extent of the deception, for, after I had advanced the phantom river totally sunk from my sight."

The phenomenon of suspension is most generally observed at sea or near the shore. At Reggio the celebrated Fata Morgana is visible, which for many centuries astonished the vulgar and perplexed philosophers. A spectator on an eminence in the city, with his back to the sun and his face to the sea, and when the sun shines from that point whoso its incident rays form an angle of about 45° on the sea, sees upon the water nonsensical figures of palisades, arches, castles well defined, regular columns, lofty towers, superb palaces with balconies and windows, villages and trees, plains with herds and flocks, armies of men on foot and on horseback, all passing rapidly in succession on the surface of the sea. These same objects may be seen at a distance of 50 miles, but at a lower point in particular states of the atmosphere, seen in the air, though less lively than on the sea, and whereas on the sea they are seen vividly coloured or fringed with all the prismatic tints. The image raised by suspension is sometimes reversed: the most remarkable instance of this is perhaps that mentioned by Captain Scoresby, who, in 1822, recognised his sight at a distance of 70 miles and the Fata Morgana of the air, although the ship itself was below the horizon, and thirty miles off.

It frequently happens that the phenomenon of the vertical mirage is combined with that of suspension, so as to show in the air both direct and an inverted image of the object, the latter being underneath.

Now all these phenomena and their various modifications depend on the different density of the lower strata of the air, and as this difference is occasioned by the heat both by heat and moisture, and as heat may be rendered from the mountain’s side as well as from the horizontal surface of the plains, from the sea as from the land; and further, as contiguous columns of air, as well as horizontal columns, may be of different density, it is easy to conceive why the mirage may be seen in very different situations, as also why it presents such varied appearances. It will also be evident that any cause which re-establishes the equilibrium of density in the different portions of the air must cause the phenomena of the mirage to vanish.

Supposing the nature of refraction to be understood, the explanation of the way in which difference of density in different strata of the air occasions the mirage becomes very simple.
at E by means of rays S E, P E, passing in straight lines through a trace of an uniform density lying between the ship and the eye. If the air is more rare at E than at a, which it may be from the coldness of the sea below a, its refractive power will be less at E than at a. In this case, rays S D, P r, which, under ordinary circumstances, could never reach the eye at E, will be bent into curves P C, S D; and if the variation of density is such that the uppermost of these rays S D crosses the other at any point z, then S D will be underbent, and will enter the eye E as if it came from the lower end of the object. If E S, E z, are tangents to these curves or rays, at the point where they enter the eye, the part S of the ship will be seen in the direction E z, and the part P in the direction E P; that is, the image S P will be inverted. In like manner other rays S n, P m, may be bent into curves S n E z E m, which do not cross one another, so that the tangent E s to the curve or ray S n will still be underbent, and the tangent E p underbent. Hence the observer at E will see an erect image of the ship at s p above the inverted image s p. It is quite clear that the state of the air may be such as to exhibit only one of these images, and thus these appearances may be all seen when the real ship is beneath the horizon. It is also evident, that if these different densities affect vertical columns of air instead of horizontal strata, the same phenomena may be produced laterally.

All the phenomena known by the names of the enchanted island, Cape Fly away, the flying Dutchman, &c., are effects and modifications of the mirage.

These unusual refractions have been known to the ancients, and are well described by them, though they seem not to have understood the rationale of the phenomena. Quintinius Curtius (vii. 5), speaking of the desert of Sogdiana, says, 'for the space of 400 stades there is not a drop of water; the violence of the sun's rays in summer kindles such an intense heat in the sand, that everything is burnt up; there also arises such a quantity of exhalations from the overheated earth, that day-light disappears and the plains offer the appearance of a deep and extensive sea.'

The following are worth notice:—

In Portugal—Miranda do Corvo, 43 leagues south-east from Coimbra, is situated on the Douro, over which there are two bridges. It contains 3841 inhabitants, or 6298, if we include two parishes that are without the boundaries of the town.

Miranda do Douro (perhaps the Roman Contia or Seopontia Parimaca) is the capital of a district of the same name in the north-east part of Tras-os-Montes, a province composed of three other similar divisions, the communes of Braganza, Torre de Moncorvo, and Villa Real. It is divided from the Spanish provinces of Zamora and Salamanca by the Douro, on the right bank of which river this city stands. It was destroyed by the barbarians and rebuilt by Alfonso I. in 1136. The population of the city is 7000, and of the comarca 31,700. It is in 41° 22' N. lat. and 6° 10' W. long.

In Spain—Miranda de Arga, situated on the left bank of the river Arga, 54 leagues south of Pamplona, and 25 west of Olite and of Tudela. The population is 10,452. At this place (not at Miranda de Ebro) was born Sancho Carranza, the master of Gines de Sepulveda, and the author of a well known Latin discourse delivered before Leo X., printed at Alcalá, in 1422. He is also the author of a part of the Carmina Buthonis, and a Latin romancero, La Moren Carranza (a nephew, not a brother, of the former), one of the luminaries of the council of Trent.

The second dignity in the Roman Catholic church, the Spanish primacy, together with high honours and virtues, which were duly esteemed by Charles V. and the pope, could not save this ornament of the church from the Inquisition, which, after keeping him prisoner in Spain and at Rome, wrung an abjuration from this old man in his seventy-second year, and confined him to the Dominican convent of his order, La Minerva, where he soon died.

Miranda de Ebro (Miraecca, Miranda Iberica, Deobriga) is intersected by the Ebro, the two principal parishes being on the right and a third on the left bank. It is 14 leagues south of Hilo, and 60 miles north of Madrid. His town is handsomely and conveniently situated on the chief north road of Spain, and within the frontier of Old Castile. Travellers who come from the free Basco Provinces are examined here, and their goods are subject to the payment of duties. Here also begins the fine road which extends to Guipuzcoa, the expense of which was defrayed by the province of Alava. This town has a strong bridge of six arches over the river, and a fine square, with fountains. The surrounding country is a picturesque plain about 2 miles square. There is no stone. The population is 2390. It is not this, but another Miranda de Duero (Duero, in Portuguese), 3 leagues from Soria, which gave birth to the cardinal Igino Lopez de Mendoza y Zúñiga, archbishop of Burgos, ambassador to England and Spain, and the last of the famous family of the mentioned Sancho Carranza. There is also a Miranda in the kingdom of Naples, in the province of Sannio, one league and a half north-east of Iserna.

Miranda, Sa DB, one of the earliest poets of Portugal, and one of the chief founders of Portuguese literature, was born at Coimbra about the year 1492. He was of a noble family, and being intended by his father for the legal profession, was educated accordingly, and became professor of law. From the dignity of his profession he nevertheless no inclination for such studies, upon the death of his father he resigned his appointment, and visited Spain and Italy, chiefly for the purpose of studying the languages and literature of those countries. On his return to Lisbon he obtained an appointment at court, where he was regarded with much esteem, but was afterwards obliged to retire to his country seat of Tapada, near Ponte de Lima, in the province of Entre Douro y Minho, in consequence of some unpleasant affair in which he involved himself. In his seclusion, and devoted to his studies, he did not lose his mind, he devoted the remainder of his days to rural enjoyment, to his literary studies and occupations, and to music, of which he is said to have been passionately fond. It was also his good fortune to have for the last years of his life a servant a wife, whom he was tenderly attached, although she was neither very young nor very beautiful when he married her. In 1553 he had the misfortune to lose his son, who was killed in Africa, and whose death he has bewailed in an elegiac composition of a strong devotional cast. His own death happened in 1558, and was an event that excited general regret. Sa de Miranda has been styled the poet of reason and virtue; and it has been said of him that he was a philosopher in poetry and a poet in philosophy. Yet greatly as the literature of his country is indebted to him (and he was the first to adopt the metres of Dante and Petrarch), few of his productions are of a class to interest the modern reader. Except as specimens of language and invention, frigid eclogues and detached thoughts in the form of sonnets, some of which are occasionally possessed scanty attraction at present, for they have not even historic value as portraying the manners and sentiments of their own age. A considerable number of his compositions, great among these are his best, are also still in fashion in which he had afterwards many imitators, greatly to the prejudice of the native literature. As a dramatist, again, he not only imitated those of Italy, Macchiavelli and Ariosto, but laid his scenes in that country, and described Italian manners. They are without consequence, as neither of his two pieces, 'Os Estrangeiros,' and 'Os Vilhalpanhos,' (and he produced no others,) shows much dramatic skill in contrivance, or comic power in execution. What is chiefly remarkable in them is the freedom with which the absolute morals of the Italian
clergy are delineated by one who was himself a rigorous Catholic. His Cartas, or poetic epistles, are of far greater intrinsic value than any of his other productions, and are acknowledged as the standard of the spirit and temper of the people in Portugal in the first half of the fifteenth century. They also throw some light on the poet’s personal character, and show him to have been of a good disposition and a sincere well-wisher to his countrymen.

SAN FRANCISCO, the birthplace of the independence of Spanish America, was born about the middle of the last century, at the city of Caracas, of which province his grandfather had been governor. He travelled on foot at the age of twenty-four through various parts of Spain, and in 1730 became a soldier in the Spanish army, and was entrusted occasionally with important matters by the governor of Guatemala. In 1733 he visited the United States, and afterwards travelled on foot through England, France, Italy, and Spain, a country which he detested. Even at that time he ventured to speak of the emancipation of his own country to Pitt and to Catherine II., who treated him with great regard, especially the empress, who entreated him to enter into her service; but the high expectations of the English public, being far more congenial to his own, drew Miranda from Petersburg to Paris in 1790. He was warmly welcomed there by Pétion, to whom he was recommended by the leaders of the opposition in the English parliament, and in consideration of this recommendation of his military services, he was appointed major-general to Dumouriez, who was sent against the Prussians, and in fact put down the French cause lest it should become a European question. But unfortunately, he was appointed to an army which did not exist, and was in&amp;#39;an, therefore, either in raising the siege of Maasstricht, on account of General Valance not coming to his assistance, nor at the battle of Neerwinden, where the left wing of the army was defeated, a reverse which Dumouriez imputed to the general himself. This charge he ever afterwards triumphantly refuted, with the assistance of Trapon Ducoudrai, before the revolutionary tribunal, which sat eleven days on this case, and, greatly to their credit, acquitted an innocent foreigner whose life was desired. The general died of a wound, which was not permitted to be seen by all the soldiers, and, as if they were not to be believed, the army of their country. Being again seized and condemned by the Directory on the 18th Fructidor, Miranda escaped, and came as a refugee to England. He returned to Paris in 1803, whence he was banished, a second time, on false accusations. He devoted himself exclusively to his country’s independence. He sailed from New York, in 1806, with a ship and some volunteers, and touched at St. Domingo, where he chartered two schooners, which were captured by Spanish cruisers (governed by Cornejo) on his return voyage, and was landed at Venezuela in the month of August. He sustained however a complete defeat, which prostrated the American cause till 1810. The supreme junta of Caracas for a moment roused the people of Caracas, but again in February 1810, when he was then the captive of Napoleon, and subsequently against Napoleon’s sway, April 9, 1811. But the cause of independence went on prosperously till the same day of the following year (1812), when a tremendous earthquake destroyed 20,000 persons in Caracas, La Guaira, and Merida. The clergy took advantage of the calamity, and stirred up the patriots to arms against the tyranny of God, whose anger they provoked by their rebellion. This fanatical outcry worked on the mind of the people, which was already great, and gave the Spanish armament an impulse. General Moreto surrendered, but he surrendered last of all, and not without honour. But a hard fate still awaited him; for, when he was about to leave the country, he was arrested by some of the officers of the independent party, and accused by Bolivar of being a traitor, and a secret ally of the British cabinet. Such a charge was strange indeed (if it does not provoke a heavier censure) at a time when both British interests and sympathies so effectually coalesced, in spite of diplomatic pretences, but more especially at the time of the Spanish colonies. The assistance and the money which it was alleged that Miranda had derived from English officers and friends, ought to have endeared him to all his countrymen whom envy had not debased. Nor should it be forgotten that Bolivar of the Spanish general Montevid, to whom he delivered his prisoner Miranda, Montevede, instead of protecting a man who was the victim of jealousy and envy, violated his agreement with Miranda, and sent him in chains to Spain. He was lodged in the prison of the restored Inquisition at Cadiz, till 1816, when death released him from his suffering his most unfortunate veteran and martyr of American independence.

MIRANDA. [See.]

MIRANDOLA. [Modern; Pica della Mirandola.]

MIRELLO. [See.]

MIREJÉS. [See.]

MIRELPOIX. [Arbois.]

MIREKELT, MICHAEL JANSSEN, born at Delft in Holland, 1662, and one of the most successful painters of the Dutch school. He was a disciple of Abraham Bloklandt, and at the beginning of his professional career painted historical subjects. Finding however a great demand for portraits, he was induced, as many other artists have been, to abandon the higher but less advantageous department of the art for the more lucrative branch of portrait-painting, in which he acquired such extensive reputation, that he was invited by King Charles I. to visit his court; but as the plague was raging at that time in London, he was deterred from accepting so advantageous an offer. His portraits were esteemed for the extraordinary accuracy of the likeness, for good taste, high finish, and great freedom of pencil. The esteem in which he was held and the extent of his practice are proved by the number of portraits which he received from Governor Lord Clarendon, from several states to have been in the thousand; Sandrait, and after him Descamps, and the "Abrégé de la Vie des Peintres," say ten thousand, which is quite incredible, though Sandrait indeed makes him to have lived an age at least as long as he painted. He died at the age of seventy-three, in 1641, in the town of Delft, which he had never quitted, except occasionally to visit the Hague, to paint the portraits of some of the princes of the house of Nassau, by whom he was highly esteemed. He must have been more admired for his small pictures than 150 florins (154.), and more in proportion for those of a larger size.

MIRÓNGA, Mr. Gray’s name for a genus of Sequoia.

MIRROR (from the French miroir), any polished surface which reflects light so as to form an image. The mathematical theory will be found under Speculum.

MISCHNA. [MISHNA.]

MISDEMÉNEUR is a term applied in the law of England to crimes and offences, whether of commissio or omission, less than felony. [Felony.]

At common law, persons convicted upon an indictment (indictment) for a misdemeanor are punishable by such fine, or by such term of imprisonment short of imprisonment for a term exceeding a year, as the court shall order, as in the case of a capital crime, as the court before which the offenders are convicted, in its discretion awards. By several statutes special modes of punishment are provided for some particular misdemeanors. The act of 14 and 15 Wm. and Mary, c. 5, provides in the case of the new misdemeanors, the legislature affixes no particular punishment. In such cases, the newly constituted offense is punishable as a misdemeanor at common law. Generally, wherever a statute prohibits an act, or a matter of public convenience, or commands an act, as a matter of public convenience, all things done or omitted contrary to the prohibition or command are punishable as misdemeanors at common law; it being a common-law offense to disobey a statute, even though the act or omission be not attributable to the defendant. A statute may also provide a prescribed mode of proceeding different from that of the ordinary course by indictment, either the extraordinary or the ordinary mode may be adopted. The statute give authority to the court of quarter-quarter sessions to make an act, or a particular matter, and prescribes a particular remedy in case of disobedience; a party disobeying an order made in pursuance of the statute may be proceeded against either in the crime of contempt or in the more usual mode of proceeding, according to the statute. He would be guilty of a misdemeanor at common law, both as having disobeyed a public statute, and as having disobeyed an order made by a court having authority to make such order. Where however a statute has made a matter a felony which before was a misdemeanor only, the offender cannot be indicted for the misdemeanor, as the minor or lower offense is said to be merged, that is, drowned or absorbed, in the higher. [Misprision.] Where a statute creates a new offense, by making unlawful
that which was lawful before, and appoints a summary mode of proceeding, the judge must be present, and an indictment will not lie. An act done in contravention of a statute which extends only to private persons, or relates to disputes of a private nature, cannot be made the subject of an indictment; for no injuries of a more private nature not in any degree concerning the king, and not accompanied by a breach of the peace, can be made the subject of a criminal prosecution. Nor will an indictment lie for an infraction of the byes-law of a corporation. But under some circumstances an indictment will lie for a breach of the byes, where the act or omission amounts to a violation of duties incumbent on the party as a member of civil society, as in the case of a parent wilfully omitting to supply proper food to an infant unable to provide for itself. To prevent the continuance of an order of magistrates, the master, if he refuse to provide for the child, may be indicted for disobedience of such order. Any act of willful negligence, whereby human life is endangered, is a misdemeanor; as to put on board a ship a package containing gunpowder, oil of vitriol (sulphuric acid), or other dangerous articles without giving notice of the contents of the package, so as to enable the master of the vessel to use proper precautions in stowing it. Every act done for the purpose of committing either a felony or a misdemeanor is a misdeemeanor.

As to the course of proceeding upon indictments for misdemeanors, see TRAVERS.

Where a peer or a commoner is impeached by the House of Commons for contempt of the House, as for-spreading scandalous reports as to the kings or the lords temporal are judges. The judgment is pronounced by the lord chancellor, and it is binding though the king dissent from such judgment; whereas in capital cases the royal assent is necessary, and the judgment is pronounced by the lord high steward. [STEWART.] MISEN'NUM. [NAPLES.]

MISHNA. [HEBREW LANGUAGE.]

MISULIS, a genus of Foraminifera. MIESITRA, or MISTRA. [LACONICA, SPARTA.]

MISSAL, the book, or ritual containing the several masses to be used on particular days or feasts.

The Roman missal was originally compiled by Pope Gelasius, and afterwards reduced into better order by Gregory the Great, who called it the Book of Sacraments. The 'Missale Romanum, ex decreto Concilii Tridentini restitutum,' is that at present in use. We have an edition before us, printed at Rome, in folio, 1826.

Antiently, each diocese, or each order of Religious, where they chose to make their particular Missal, accommodated to the festivals of the province or order. Such were the 'Directoriurn Missae Ecclesiae Moguntinensis;' the 'Missale Ecclesiae Herbipolensis,' fol., Herbip., 1484; the 'Missale secundum rubricum Archipriscopatus Ecclesiae Pragensis, fol. Norimb., 1568; and such in England were the Missals of the churches of Hereford, York, and Sarum, the last of which continued to be printed as late as 1857. Among the Missals prepared for the orders of the Religious may be named, the 'Missale secundum ritum et ordines sacri Ordinis Premonstratensis, autoritate Joan de Prueta, Abbatis Premonstratensis, auctum et editum,' fol., Par., 1578; and the 'Missale proprium Sanctorurn trium Ordinum Fratrum Minorum ad formam habitum Romanam restitutum, sub patrono sublimi; additis Missæ sacer Ritualum Congregationis noviter concessis et approbatis,' fol., Ven., 1700.

We have also the 'Missale Illiricum,' 4to., Ven., 1526; the 'Missale Chaldaicum, juxta ritum Ecclesiae Moguntinensis,' fol., Rom., 1546; and the 'Codex Mystici Misericordiae, Armesnorum, seu Liturgia Armenia,' Lat. et Armen., fol., Rom., 1677.

The Missals of the thirteenth, fourteenth, and fifteenth centuries, written purposely to the desiring of the art of printing, present in many instances, the finest specimens of illumination now preserved in our libraries.

MISSEL-THRUSH. [TRUSH; MERULIDE.] MISSELTOE, a parasitical plant found in this country, the flowers and fruit of which are in many respects a production of great interest to the physiologist. Instead of describing so very common a plant as this, is.
we shall advert to some of the more striking facts connected with it. The seeds in germination seem to offer an effect by which they are propelled; for, after they shoot downwards, and the plumula upwards; for it is found that the radicle of the seedcocoons itself downwards on the body to which it is attached, whatever may be the position of the surface of that body with respect to the earth. For this purpose, we see that they are glued on all sides, be suspended by a cord some distance from the earth, both the upper and under seeds, as well as those at the sides, all direct their radicle to the surface of the ball. This property enables their growing upon the branches of trees, to whatever side they may happen to stick. According to Dutrochet, he owes this property to a tendency on the part of the radicle of the seedcocoons to avoid light; he attached seeds to the inside of a square of glass, and the radicle was directed to the interior of the apartment; he then glued others upon the outside of the squares, and they turned their radicles down upon the glass, thus directing themselves towards the dark interior; and other experiments were tried with the same result.

In fixing itself upon a branch, the embryo of the seedcocoons curves its radicle down upon the bark, and then adheres firmly to it, and it is a twelvemonth before the plumula begins to develop. It may be that the radicle time after time pierces the bark and introduces itself below the fibres, where it expands and acts the part of a root by attracting the fluids which are necessary for the support of the parasite.

It is not a little remarkable that in the structure of its ovule the seeds of other genera of the same family would offer a singular fact of the ovule not existing at the time of impregnation, nor appearing till from six weeks to two months later; at present no explanation has been offered of this very unintelligible circumstance.

The fruit, which is covered with a viscid pulp, is made by the Italians, and even in Herefordshire, into a kind of birdlime; and as it is a favourite food of the large or small thrush, it is thought to have given rise to the proverb 'the cock a day keeps the thrush.'

The plant is not of any known use to man, and is of popular interest chiefly as having been connected with Druidical superstitions. The seedcocoons of the Druids was exclusively that found upon the oak, and was possibly so much valued because of its rarity; for its appearance on that tree is so rare, that many persons have believed the Druids' seedcocoons to have been some other plant or to have had no real existence. But it has lately been found on more than one oak-tree in Herefordshire, and it is probable that it was plentiful in the oak woods of Snowdon before the damp western parts of Britain were disforested. A good account of the seedcocoons will be found in Loudon's 'Encyclopaedia,' vol. ii. p. 435.

MISSIONS. The 15th verse of the 16th chapter of Mark is the great scriptural authority for missions. In the sixth century (590-604) Pope Gregory the Great sent missionaries to Britain, to convert the people to the Christian faith. Similar means were adopted in other countries, until, about the close of the tenth century, when the Christian religion had become the prevailing faith throughout Europe. Other fields for missionary exertion were then sought. Attempts were made to proselytize Christianity in Tartary and China; and the Portuguese, who visited Abyssinia about 1450, endeavoured to bring over the Christians of that country to the Catholic faith. The history of this mission may be seen in Mosheim's 'Ecclesiastical History.' (Amplyford, Pps.; Lomn.)

With the earliest maritime discoveries of the Portuguese the desire for the conversion of heathen people was excited with renewed zeal, and may even be said to have been instrumental in stimulating the passion for maritime expeditions. About 1430 Pope Martin V granted plenary indulgence to the Portuguese who conquered pagan and infidel countries. Columbus himself was strongly urged to discovery by the desire of propagating the Roman Catholic religion.

Modern missions may be said to have commenced at the same period with these discoveries, in which the popes took great interest. On the return of Columbus to Spain from his first voyage, the results were formally announced to Pope Alexander VI.

The work of converting heathen people was at first undertaken in a barbarous spirit. The commanders of the expeditions which Don Henry of Portugal sent out in the fifteenth century had 'orders to convert the natives of the coasts of Africa and the islands and coastal nations and nominal conversions were often effected by the sword.'

In 1494 Diego Cam brought four natives of Africa to the court of Portugal; they were sent back with presents and a message to their sovereign, desiring him to embrace Christianity. The natives were baptised, the king and the prince his son acting as sponsors. In his second voyage to the new world, Columbus was accompanied by priests with church vessels and offerings, and they received the natives within the pale of the church by 'fair means.'

The conduct of Cortes in Mexico is an example of the spirit in which conversion was attempted in the New World. Having cast down and destroyed the altars in the temple of the Indian temple, which was hung with rich mantles and adorned with flowers. Cortes then ordered four of the native priests to cut off their hair and to put on white robes, and placing the cross upon the altar, he committed it to their charge. They were taught to make wax-candies, and Cortes enjoined them to keep some of the candles always burning on the altar. A lame old soldier was left by Cortes to reside in the temple, to keep the native priests to their new duties. The church of the Indian temple was consecrated by the bishop of Panama, and the priests attended Mass in the New Spain. Father Almeda, who accompanied Cortes in his expedition, explained to the Mexicans the 'mystery of the cross.' He then showed them an image of the Virgin, and told them to adore it, and to put up crosses in their houses. One time the Indians invited the Spaniards to a feast. The Spaniards began to feel the power of Cortes, some of the church conciliated his favour by presents. Twenty native women were presented to him, who were baptised by one of the ecclesiastics, and Cortes gave one to each of his captains. 'These were the first Christian women in New Spain.'

The natives both of India and the New World room perceived that one of the means of consolidating their conquerors was to make a profession of Christianity. In Hispaniola, many natives were thus in ordinances of baptism. In 1538, Andra Galvan, governor of the Molucca islands, sent a ship commanded by Frances de Castro towards the north, 'with orders to convert as many as he could to the Christian faith.' Castro himself baptised many of the principal chiefs of Ambon. Many similar facts might be adduced to show that at this period true religion made little or no progress in newly discovered countries; and yet during the sixteenth century not a fleet sailed for India or Africa without a bishop, priests, and ecclesiastics.

The stream of missionary enterprise was at length directed and regulated by different religious orders and distinct institutions. One of the objects of the Society of Jesus, established in 1540, was the extension of the Roman Catholic Church in the most active and energetic missionaries to heathen countries. Their activity roused the zeal of the Franciscans, Dominicans, and other orders, and early in the seventeenth century institutions were founded with a view of rendering the labours of missionaries more effective by a preparatory course of training. In 1622, Pope Gregory XV. founded at Rome the 'College de Propaganda Fide,' which was soon richly endowed. Pope Urban VIII. was one of its principal benefactors. This college consisted of 13 cardinals, 2 priests, 1 monk, and a secretary. It sent out large numbers of missionaries to aid the propagation of the Catholic faith in all parts of the world; published books to facilitate the study of the languages; distributed books among various nations in their own language; and maintained in various institutions young men intended for foreign missions. To the above institution was added the 'College of Propagation for the Propagation of the Faith,' founded by Pope Urban VIII. in 1627, which became the central institution in which missionaries were prepared. This establishment was endowed by a Spanish nobleman, who presented his palace and all his possessions to the pope for the one purpose of supporting the liberal institutions. Numerous institutions of a similar character were afterward founded in France. The 'Congregation of Priests of the Foreign Missions' was instituted by royal authority, and about the same time the 'Parishian Seminary for Foreign Missions' was founded. Bishop oils for the education of foreign missionaries.'
also a French establishment, was another of these institutions. These establishments were under the authority of the 'De Propaganda' of Rome. Henry III. of France took considerable interest in them, and Henry XIV. and Louis XIII. assigned funds for their support. Private associations were also formed in France, in the time of Richelieu, for sending missionaries to Canada, which were joined by many persons of rank and distinction. The Jesuits were among them. The mission of Louis XIV., they endeavoured to propagate Christianity among the natives on the banks of the Mississippi. Towards the close of the seventeenth century there were not fewer than eighty seminaries in different parts of Europe which were dependent on them. The Jesuits, Dominicans, Franciscans, and Capuchins were the most active in these undertakings, which were conducted on a large scale and with a regularity and combination of means altogether superior to the efforts made, immediately after the discovery of America and of the path to India round the Cape of Good Hope.

India, Japan, and China were the principal fields of exertion. Xavier, who was canonized by Urban VIII. under the title of the 'Apostle of the Indies,' proceeded to India at the request of John III., king of Portugal, for the purpose of extending the Christian religion in that quarter, the king being disappointed with the little progress which it had made. Xavier was a man of superior genius and laboured zeal, and achieved the propagation of the faith with considerable success at Goa, on the coast of Comoros, in Malacca, in the Moluccas, and in Japan, where he died in 1552, on the frontiers of China. In Japan, where Xavier was the only missionary, the people were described as professing a sort of Christianity; in 1596 the converts were estimated at 400,000. The exercise of practical charity, which was inculcated by the Christians, is said to have been the main cause of this success; the native priests let the sick and needy die of neglect and starvation. After an existence of nearly a century, the protection which the Christian religion had received from the rulers of Japan was withdrawn, and a cruel and bloody persecution commenced. The Jesuits were driven out of Japan with a spirit worthy of the early martyrs. This disastrous termination of the mission has been attributed to the intrigues of the Dutch, who wished to possess themselves of the commercial privileges enjoyed in Japan by the Portuguese. Pussen-dorf, in his History of Europe, says that a letter or pretended letter of the Jesuits was shown to the emperor of Japan, in which they had promised the pope to bring Japan under his authority. Since this period no successful missionary operations have been carried on in Japan. (Charlevaux, L'Histoire du Christianisme dans l'Empire du Japon, Rouen, 1715.)

China was, for a long time, a scene of successful missionary exertion under the direction of the Jesuits. Father Ricci, an Italian, went to China in 1581. Matthew Ricci, an Italian Jesuit, was the first missionary who obtained an introduction to the court, and is justly regarded as the founder of the Chinese mission. Ricci proceeded to China in 1585, but he was not introduced to the emperor until 1601, when he presented him to a picture of Christ and another of the Virgin, and obtained permission to preach. Individuals were chosen for this mission on account of their scientific acquirements, and it was Ricci's mathematical attainments which rendered him acceptable to the emperor. In 1605 the whole of the Jesuits in China were received at the emperor's court, and several ladies of the court should receive instruction in the Christian religion, and some of them were afterwards baptised. Adam Schaal, another of the missionaries, was employed to reform the Chinese calendar and their system of astronomy. Shortly afterwards two handsome customs were erected at Pekin with the permission and under the protection of the emperor. Under these favourable circumstances Christianity made considerable progress. In 1664 the mission was established at Pekin. The empress dowager, however, and the people were forbidden to disturb the Christian converts or to profane their churches; but in the succeeding year their fears were confirmed, and 3 Dominicans, 1 Franciscan, and 21 Jesuits were banished to Canton, only four being allowed to remain. A few years afterwards the missionaries regained the favour of the emperor, and Father Verbiest was appointed president of the Tribunal of Mathematics, and for five months gave lessons to the emperor in the mathematical sciences. An assembly of mandarins decided that the Christian religion taught nothing that was evil or that tended to sedition; but the erection of new churches was forbidden, and the Chinese were warned not to desert their antient faith. Notwithstanding this, it is stated that in the years 1702-1704, 5 French missionaries arrived at Pekin, with the title of 'mathematicians of Louis XIV.' One of them attended the emperor when he travelled, and the other explained to him lessons in the sciences twice a-day. In 1697 a Jesuit was dismissed from the emperor a more favourable edict for their religion. He also granted them a site for the erection of a house and church within the walls of the palace, giving them building materials, and the church was commenced the next day. The work. The church was consecrated and opened in 1702. In 1710, a cardinal legate was sent by the pope to settle differences which had arisen amongst the members of the mission, but he died at Macao, and his successor did not reach China until 1719, when he was honourably received by the emperor, with whom he had several interviews. In 1717 however the missionaries had been again accused of seditive designs, and the emperor confirmed a decree prohibiting the building of churches and Europeans were in future only allowed to remain in China on condition of their promising never to return to Europe. In 1723 the throne was filled by an emperor who at first was rather favourably disposed towards the missionaries, but he afterwards issued an edict in which they were driven out of the empire, and only tolerated at Pekin and Canton. Duhalde, on whose authority the above statements are given, says that above 300 churches and more than 300,000 Christian converts were destroyed by this act. Several families of rank were degraded or exiled from the emperor on account of professing Christianity. In 1732 the missionaries, thirty in number, were banished to Macao, having from motives of conscience disobeyed the edict which the propagation of the Christian religion was at this period kept together by native catechists, and a few of the missionaries remained in China in concealment, or re-entered the country by stealth. The mission is still carried on, in one or two decades under the permission of the government to put it down. The years 1805, 1811, and 1813 were years in which the Christians were actively persecuted. In 1810, 23 missionaries and 80 native agents were engaged in China, and the number of native Christians was 215,000. In 1820 a European missionary was stationed in the provinces by order of the government. At present there are Catholic communities in all the provinces, where service is performed by native priests. The Catholic community of Pekin amounts to 26,000 members. In the province of Shantung, China, it is believed that the cross is planted at the head of the dead. If a native clergy can be formed, greater toleration may be expected, as Christianity is chiefly objectionable as an instrument of government, and the local authoritie disdaining or tolerating a community, are interested in preventing the circumstance being known in higher quarters. (Medhurst's China, 1836.)

In November, 1836, a violent decree was issued against the missionaries and Christians of the Fo-Kien mission; the churches were closed, and safety was sought in flight; but the decree was not a general edict, and was issued only by the provincial governor. In August, 1837, several Catholic churches were destroyed in Cochinchina, and some of the Christians were executed. In 1838 the empress dowager, who was a French missionary. The college of St. Joseph at Macao is for the education of Chinese students. The number of missionaries who proceed to the interior from Macao is considerable in every year. Notice is given to their adherents on the route, and at length they arrive by stealth at their destination, where they often live in great seclusion, the converts coming to them secretly for instruction. In some parts the worship is conducted openly. In 1836 a new church was opened at Pekin. Mr. Delarue states that the Chinese are formed into a gentleman that the different superiors of the missions in Macao negotiate bills in Europe to the amount of 40,000l. annually. Dr. Milne, the confidant of Mr. Morrison in China, speaking of the missionaries, says that the "learned, personal virtues, and ardent zeal of many of them." They translated the greater part of the New Testament into Chinese, and promoted a knowledge of science and the arts. The Catholic missionaries in China at the present day are far inferior to their predecessors.
In the seventeenth century the Jesuits sent many missionaries to the East Indies, to Tonquin, Bengal, Madura, the coast of Coromandel, and to Surat. In the course of fifteen or sixteen years above eighty missionaries were sent to the countries of whom some were shipwrecked and others died on the voyage, and from the effects of hardships and difference of climate. The East India mission had many attractions for the ardent missionary, and it was represented that one individual might calculate upon converting a hundred souls.

In the Madura mission it was stated that each missionary baptised every year at least a thousand converts. The manner in which the missionaries of this period endeavoured to add to the number of converts has been often condoned. They believe that the process of conversion was a slow and arduous process; and the fact that the early Spanish and Portuguese commanders was said to be in some instances exchanged for more subtle though still uncirupulous and unjustifiable means. The missionaries were accused of corruptions, for the purport of the Christian doctrine; and the moral system which they substituted for that of the natives did as little violence as possible to rooted prejudices. In India it was alleged that converts to Christianity were permitted to exercise the least objectionable rites of their former faith; but this licence was not sanctioned by the church. Respect was so far paid to the prejudices of the Hindus as to appoint separate missionaries to exercise their calling among the Pariahs. One of the Jesuits, in order to promote the success of his mission, was heard to say that the character of a Brahmin, and produced a piece of parchment containing formulae professing to prove that the Brahmins of Europe were more antient than those of India, and that the Jesuits of Rome were lineally descended from the Wise Men. Similar statements of this kind have been current among the Pariahs, which are doubtless somewhat exaggerated. (Juvencu, Histoire des Jesuites; and Vorbert, Mém. Hist. sur les Missions des Malab. Also The Missionaires' Arts discovered, London, 1857; and on the other side, Défense des Missionnaires de Chine,éc. Paris, 1845.)

It is somewhat difficult to form a just estimate of the labours of the Jesuits in America. Some writers are favourable and others unfavourable to them. It may perhaps be said that the Jesuits did not fail in their efforts to develop the energy and good qualities of the natives, although in Paraguay, and in Upper and Lower California, the missionaries were in possession of all the resources of the country, and enjoyed the extraordinary power which these circumstances conferred. In California the country was left almost entirely in their hands, and they soon acquired a dominion as complete as in Paraguay; but, whether from ignorance of human nature or the unfitness of ecclesiastics to superintend the whole social economy of a people, the energy of the Jesuits in Paraguay and in America dwindled under their care into the most helpless and ignorant of beings. The object of the experiment was to bring a wild race to domesticated habits, and the Indians were taught the arts and sciences and were worked for a common stock; but their independent character was destroyed, and nothing better arose in its place. Of the one hundred thousand inhabitants living in thirty towns under the control of the Jesuits when that order was expelled from South America in 1677, there were not a thousand remaining in those east of the Parana in 1825. The towns beyond the Parana were fared little better under Dr. Francis. (Sir Woodbine Pariah's Buenos Ayres and Provinces of La Plata.) The experience of the Jesuits and of self-conversion upwards of a million of the natives of both America. In Dr. Forbes's 'California,' compiled from original sources, the process of conversion is described as consisting of the offer of a mess of potage and holy water; the acceptance of the latter being the condition of the former grant, and its reception a proof of faith. Attendance to prayers and meals were the exterior evidence of conversion. Sir Woodbine Pariah states that the mariu of their civil governors, and that the protection inspired by the friars who were sent in place of the Jesuits, were not so happy as the Jesuits. In the suit communities in little more than a quarter of a century. When they were displaced, and the people of the mission of St. Louis sent a memorial praying that the faith and structure of the Jesuits be restored. The governor, interpreted as the prelude of an insurrection, the simple people were found not in arms but in tears.

In 1700 the three orders of Capuchins, Jesuits, and Carmelites were the most active missionaries. The Capuchins had twenty-five missions in Turkey, and missionary stations were established in Persia, Georgia, and Africa. The Jesuits had ten missions in Turkey, and the Carmelites three. Many of these missionaries had acquired a knowledge of medicine, and obtained access to families as physicians. In 1717 the Jesuits supported missions in the islands and continent of America, in Grecia, Asia Minor, and the Archipelago, and in Egypt, Syria, and Persia, besides those in India. Louis XIV. made grants of land to the missionaries in Canada, and established for some of the earliest descriptions of North America.

In 1822 the cause of missions was revived in France by the 'Institution for the Propagation of the Faith,' which was conferred a charter. Several popes have granted to its members certain indulgences. In 1837, as a mark of gratitude and approbation, the pope presented the institution with the body of St. Exupéry, which has been recently discovered in the catacombs at Rome. The remains, richly ornamented at the expense of his fellow-countrymen, are enshrined in one of the churches of Lyon. Seventy-six Roman Catholic bishops in various countries have publicly expressed their approbation of the institution. Its income in 1836 amounted to $5,860, of which 41,678 was collected in France, 28,964 in Belgium, 2,771 in the Sarthian departments, 109,816 in the United Kingdom (7681 from England), 9,241 from the States of the Church, 5,001 from Prussia, and from other countries smaller sums were received. The receipts for the year 1838 in France amounted to 41,678. The 'Materials for the Propagation of the Faith' are published by the society every two months; 48,000 copies are printed in French, 9500 in Italian, 6000 in German, 2000 in English, and 1000 in Flemish. The funds are placed at the disposal of the missionaries and the Lazarite missions and the Jesuit missions. There is no part of the world in which Catholic missionaries are not supported. (Geography of Missions.)

The first Protestant mission of which we have any account was founded in Geneva, which sent missionaries to America in 1556; but it is believed to have existed only a short time. Early in the seventeenth century the Dutch, who had taken Ceylon from the Portu-
gueses, adopted the same policy. The English government only on condition of subscribing to the Helvetic Confession, and becoming members of the Reformed church. The higher rank of natives possessed to abandon their former religion, and those whom the Portuguese had converted deserted. Their conversion was begun after learning the Lord's Prayer, the Commandments, and grace before and after meals. In 1665 the number of converts in one district was 62,000; and in 1668, in a district containing 278,000 inhabitants, 160,000 had made a profession of the Christian faith; and the Dutch made attempts to gain converts. A church at Java was opened in 1621, and a century afterwards there were 100,000 Christians in the island. Translations from the Bible and other religious works had been made in their language.

It was some time after the English had begun to form settlements in North America before attention was directed to the religious condition of the natives. In 1644 a petition was presented to parliament from a minister of the Church of England, supported by many English and Scotch divines, which urged the duty of attempting to convert the natives of America to Christianity. Soon afterwards an ordinance of the Lords and Commons appointed the Earl of Warwick governor of the islands and plantations of North America; and a committee appointed, to consider matters, 'but chiefly for the advancement of the true Protestant religion, and for the spreading of the gospel of Christ among those that yet remain there in great and miserable blindness and ignorance.'

In 1646 the General Court of Massachusetts passed the first act 'for encouraging the propagation of the gospel amongst the Indians.' In 1649 an incorporated body was established with the authority of parliament, under the title of the 'Propaganda for the Gospel in New England.' In 1661 Charles II. renewed the Society's charter, on the ground that it was now fit to lay a foundation for educating, clothing, civilising, and converting the Indians. The design of the Society was to support and maintain missionaries to instruct the natives in the English language, and to teach them useful trades. Eliot, called the 'apostle of the Indians,' and Mayhew, had already laboured for several years.
in the conversion of the native tribes of New England. In a narrative of their exertions, published in 1653, and dedicated to Cromwell, an account is given of the conversion of several chiefs. In "A Letter to a Friend," published in 1655, Eliot states that a great desire for baptism had arisen amongst the Indians; but never was there a missionary so conscientiously scrupulous as to trust to professions of this kind. He told the Indians "how necessary it was for them to learn languages before they left their scattered and wild course of life;" and he began the formation of a village, in which they might learn the advantages of living in a community. The Indians were taught various useful arts, and after several years were admitted as Christian Indians, and taught them how to give an account of their conversion and faith at a public examination.

In "A Further Account," published in 1659, there are accounts of the progress of the missions among five converted Indians. Five Indian youths were receiving an education at the Cambridge grammar-school in Massachusetts, two of whom had been examined in Latin before the magistrates and elders of the place. In 1679 several "praying towns," as the villages of the converted Indians were called, had been erected under Eliot's auspices. In 1674 there were four "praying-town" in Massachusetts. Eliot died in 1690, at the age of eighty-six. Mather, Bourne, Sergeant, and Bramer succeeded him as the work progressed. I have learned to know of Christianity, but none of them laboured so successfully as Eliot. Bramer was an ardent and enthusiastic labourer, and exhausted himself by extraordinary exertions. He was sent to America in 1742, by the Missionary Society for Provisions for the Propagation of the Gospel and the Negroes and Indians in the city then being 1500. In 1773, Gibson, bishop of London, addressed the missionaries in the English plantations, exhorting them to assist in instructing the negroes. In a sermon preached by Beilby, bishop of Chester, in 1783, the above Society, the civilisation and conversion of the negroes were announced as one of the great objects of the Society.

The Danish and Moravian missions were the first two in which the chief object was the conversion of the heathen; but the exertions of the Missionary Society for the Propagation of the Gospel were for some time limited in its operations, and may be regarded in the early part of its existence rather as a "Pastoral Aid" Society. The Danish missions owed their existence to Frederick IV., who, about 1705, became anxious to extend the gospel to the heathen among the inhabitants of the East Indies. Siegenbach and Plutusch, who had been educated at Berlin, were the first missionaries sent out; they proceeded to Tranquebar, on the Coromandel coast, where the Danish missions and the state of the heathen was commencing with persons in Denmark, Norway, Germany, and England, who took an interest in the subject. The reports of the two missionaries, which appeared annually, under the title of "A Brief Account of the Measures taken in Denmark for the Conversion of the Heathen," and which was translated into English, excited considerable attention. The Danish missions immediately established schools, and prepared catechisms in their own language and giving a ready and unhesitating support to the spread of the gospel, the progress of the work was very rapid. The society flourished, and the reports of the society, together with the reports of the mission, were eagerly read. In the year of the Testament was begun, and completed in 1711: but they had no press, and were obliged to employ transcribers. The "Society for the Propagation of the Gospel" opportunity was taken of some three hundred and fifty persons to publish a catechism, and engaged a printer for the mission. In 1714 the missionaries had published thirty-four different works in the Malabari language, and fourteen others, written by Catholic missionaries, were used by their scholars and converts. They maintained and clothed fifty-six children in the schools, to defray the charge of which they had "no certain fund that will supply the expense for one day." In 1714 Frederick IV. established a college, or society, for the support of the missionaries, and required them to make an annual report of their proceedings. The instructions to the Society indicate both good sense and earnestness. The Society was directed to take into consideration the prospects and condition of converts:—"How they and their children (besides the knowledge of the principles of Christianity) may be instructed in useful arts, and how also they may be employed, according to their respective conditions and capacities." Siegenbach came to England in 1719, and after a short time, he was introduced to several members of the royal family. The archbishop of Canterbury and the bishop of London promised to assist the mission. About 1727 the Danish missionaries were desirous of extending their labours beyond the district of Tranquebar; and a missionary, designated as a "German" Missionary, was sent by the English Society for the Propagation of the Gospel. In 1721 Egede, a Danish missionary, proceeded to Greenland. The Moravian missions commenced in 1731, and were supported with singular activity and perseverance. Count Zinzendorf, the founder of the Moravians, or United Brethren, would be to appoint two Protestant ministers, with a competent allowance, to dwell amongst them, in order to instruct them in the true religion and confirm them in their duty to the majesty. Ordered that the matter be referred to the archbishop of Canterbury, the bishop of London, and one of the bishops of the provinces, for the consideration of the whole body of the clergy, as to the most effective means of promoting the conversion of the heathen. This was the object of the Missionary Society for the Propagation of the Gospel. In 1704 Col. Duddingston, of Newfoundland, wrote to the lords of the Board of Trade and Plantations, that he was not sent amongst the Indians, "to defeat the French missionaries, to whom they are infinitely bigoted," we should lose their allegiance. About the year 1680 the condition of the negro slaves in our settlements began to excite attention. In 1689 Morgan Godwyn, "some time student of Christ Church, Oxon," wrote a "Persuasive to the Instructing and Baptising of the Negroes and Indians of our Plantations. Towards the close of his life, Eliot had begun to instruct the negroes in New York; and in 1704 the Society for the Propagation of the Gospel established catechising schools in New York for the negroes, the number of negroes and Indians in the city then being 1500. In 1727, Gibson, bishop of London, addressed the missionaries in the English plantations, exhorting them to assist in instructing the negroes. In a sermon preached by Beilby, bishop of Chester, in 1783, the above Society, the civilisation and conversion of the negroes were announced as one of the great objects of the Society.
there, while attending the coronation of Christian VI. at Copenhagen, saw two natives of Greenland who had been baptised by Egede, and he heard with regret that the government was on the point of abandoning the mission in that country. About the same time he learned from a negro, who had become acquainted with his servants, and had a sister in one of the Danish West Indian islands, that the latter was earnestly desirous of receiving religious instruction. The congregation of the United Brethren at Hernhut sent a missionary to the island, who, after a time, returned with a large number of converts. In eight or nine years after they had begun to send out missionaries, Greenland, the islands of St. Thomas and St. Croix, Surinam, Berbice, Laíapul, Tantary, Algiers, Guinea, the Cape of Good Hope, and Ceylon, had become the scene of their labours. The Greenland mission commenced in 1733, and was supported in spite of extraordinary hardships and difficulties. The missionaries were often compelled to put to sea in Swan boats to obtain a supply of fish, and shell-fish and sea-vegetables were not unfrequently their only food. For five years they persevered in bearing up against these hardships, though as yet the mission had not been productive of the slightest advantage to the natives. Their endeavours were however at length successful, and a community was established at Nanguvit. In twenty-five years about 700 Greenlanders had been baptised; and in 1767 the settlement contained 300 individuals, and had become a pleasant village in the midst of a desolate region. Sheep, goats, and vegetables had been introduced. Sowdigers had learned to read and write, and were taught church music. In 1758 a second settlement was formed, called Lichtenfeld; and in 1774 a third, called Lichtenau. The mission in the island of St. Thomas was commenced in 1752; and in 1778 about 200 negroes were under religious instruction, and some time afterwards the number of baptisms averaged 100 a year. From 1732 to 1762 sixty-six brethren and sisters who had gone out as missionaries died in the three Danish West Indian islands. In 1737 Mr. Morgan and his wife in Jamaica, at the request of several gentlemen of the island, owners of estates, who built a house for their residence, and encouraged them in instructing their negroes. Scarcely any opposition was made to the missionaries, but after a time the work languished. In 1734 a party of the brethren settled in Georgia, in North America, with the intention of introducing Christianity amongst the neighbouring tribes of Indians; but the European settlers in the colony, by their perseverance, at length, succeeded in establishing Christianity amongst the settlers in Delaware, and went to America, and the other came home for his health. In 1796 a third missionary was sent to India. The following form of agreement was entered into by the Baptist missionaries in Bengal, in 1805:—'It is necessary, in order to effect the object, that the missionaries shall be able, from those things which would increase their prejudices against the Gospel. Nor is it advisable at once to attack their prejudices by exhibiting with scrupulosity the sins of their gods; neither should we, upon any account, do violence to their images, or interrupt their worship, the real conquests of the Gospel are those of love.' In the spirit the Baptist missions have affected considerable good in India, by the establishment of native schools, and translations of the Scriptures, as well as by preaching. In an early period of the mission, a printing-office was established at Serampore, and in 1806 proposals were made for the translation of the Scriptures into fifteen Eastern languages. A total expenditure of 13,000l. was incurred in the Serampore mission in the course of five years, of which 5,500l. was received from England, the remainder being made up by the labours of the missionaries, and the emoluments arising from the professorship which Dr. Carey held in the college of Fort William. In 1807 the tracts issued by the mission were estimated to have been sold to the amount of 22,736l., and this sum was to be submitted to the bishopric of the mission before publication, in consequence of some incompatible expressions used in a tract which had been issued without revision; in which, amongst other things, Mohammed was called a fool. The whole of the printing-office was burnt down, and foists of type in sixteen languages were destroyed, and sheets of translated works in progress. On the disaster being known in England, the sum of 14,011l. was raised in less than two months to replace the loss.
sides a considerable sum in Bengal, and 1800. in the United States. In 1827 the missionary efforts of the Baptists were divided by a separation of the Samoan mission from the general missions of the Society, but the differences were terminated in 1838, and the two Societies are now united. Foreign missions have also been established by the Free- will Baptists and by the American Baptists.

The 'London Missionary Society' was formed in Septem- ber, 1795, by the 'Church Missionary Society' of various denominations, but it is now supported by the Independents. In consequence chiefly of a memoir read before the Society by the Rev. Dr. Hawkes, rector of Aldwinkle, Northam- ptonshire, and 1807 it sent its first missionaries to the Sea Islands, where no missionaries had before laboured. In August, 1879, twenty-nine missionaries, several of whom had wives and families, embarked on board the ship 'Duff,' which the Society had purchased. The 'Duff' reached Otaheite in March, 1879, and the missionaries were received by the natives in the most friendly manner, and a district being ceded to them in due form, twenty-five persons, including seven women and children, took up their abode in the island. The commencement of this mission was a pe- riod of great excitement to the friends of the cause in En- gland; and on the return of the 'Duff,' a day of thanksgiving was appointed in the Independent churches. In December, 1879, the 'Duff' sailed on her second voyage to the South Seas, carrying forty-six missionaries and two London merchant shipmasters, one was captured by a French privateer on the 19th of Fe- bruary, and taken to Rio, and on re-embarking at that place, they were again captured, and ultimately returned to En- gland after an absence of ten months. In the meantime the native population on Otaheite had been greatly increased, and the natives having become unfriendly to it. Eleven of the missionaries, with eight women and children, left the island for Port Jackson, seven of the missionaries determined upon remaining, and several proceeded to Tongoataboo. To prevent an attack of the missionaries who had remained at Otaheite offered to give up their personal property and stores and tools to Pomare, the king, but he declined taking charge of them, and they were daily in fear of death. The expenses of this mission, which consists of seven married native female, and another made a declaration of inofful opinions. In May, 1850, before these events had become known in England, eleven other missionaries had sailed for Otaheite in a convict ship, in which a malignant fever broke out. Of this number one died at Port Jackson, one aban- doned the mission at that place, and one was taken home, at the request of his brethren, for insubordinate conduct. The missionaries who had been left on the island made no pro- gress in their work, and in the course of five years had scattered. The Society is now composed of twenty-eight missionaries, and in 1880, on a war breaking out at Otaheite, the married mis- sionaries sailed for Huahine; when their houses were burnt and their gardens laid waste. In February, 1851, the 'Clare,' a vessel of 1136 tons, was wrecked on the coast of Russia, and 1850, the settlement of the missionaries consisted of thirty-nine persons. A printing-press was set up, tracts were distrib- uted, and slaves ransomed with a view of being instructed in the faith and converted to Christianity. In addition to the above societies, there has been lately formed in England the 'Colonial Missionary Society.' The 'Society for propagating Christianity amongst the Jews,' which was formed in 1701, has a year's income of about £2000, and is conducted under the immediate direction of the Board of the Established Church, and was instituted in 1886. It grants about 18,000£ a year to 175 clergy and lay assistants, who are sent to populous districts which are not sufficiently pro- moted with regard to missions. In the last four years, 'City Missions' have been formed in London and several of the large towns. Agents are appointed who visit the poor and exhort and read to them the Scriptures. The 'London City Mission' has an income of upwards of 400£, and employs 49 agents, who last year made 186,315 visits, and distributed 233,036 tracts. The 'Society for the Promotion of Christian Knowledge,' the 'Bible Society,' and the 'Tract Society,' though not missionary societies, are auxiliaries of foreign missions, whose objects they promote by grants of books, &c.

There are many missionary institutions in Europe and the United States. The 'American Board of Commis- sioners for Foreign Missions' is the principal institution of the kind in the United States; and each of the principal institutions in that country, as in the case of the American Baptist, has its own institutions for sending out missionaries, each of which has numerous auxiliary societies in union and cooperation. The principal missionary societies are—the Berlin Society, German So- ciety, Netherlands Society, Paris Society, Rheims Society, and the Society of the Moravian Brethren.

Present State of Societies.—The expenditure of fire of the several societies in 1891 amounted to above 350,000£, according to their last annual Reports; and the material support which is afforded them by other reli- gious institutions would considerably swell this amount. There are also several institutions whose operations are on a much smaller scale.
1. Incorporated Society for the Propagation of the Gospel in Foreign Parts. Receipts for 1837, 43,365£; expenditure, 43,949£; number of subscribers about 12,000; the number of legacies of above 1,000£ received from 1702 to 1837, 571, of which 50 amounted to sums above 10,000£, including two of 45,000£, and 30,000£. The number of subscriptions, donations, and legacies, to the amount of 16,082£; legacies, 475£; dividends and rents, 5,747£; special fund raised for the education and religious instruction of the negroes in the British West Indies, 603£; payments for the erection of free schools, grant for erection of school-houses in the West Indies, 13,000£. The chief expenses were under the following heads:—North America (dioceses of Quebec and Nova Scotia), 12,254£; India, missionaries and teachers, 693£; expenses of Bishop’s College, 16£; contributions for the general expenses of missions and schools, 1821£; Cape of Good Hope, 2 missionaries and outfit, 339£; West Indies, payments for the erection and enlargement of churches, chapels, and school-houses, 13,890£; towards the support of clergymen and unordained teachers engaged in the religious instruction of the negroes, 7,169£. Urged by the recent social changes in the West Indies and the spiritual destitution of the penal settlements in Australia, the Society has recently made advances of £5,000. In the two quarters preceding, the Society had the management of a grant annually voted by parliament for the support of clergymen in the North American Colonies. Notice was given in 1832 that this grant would be discontinued in future; but on the remonstrations of the Society, that the Missionary work in the Indian missions would be unprovided for, the government agreed to continue the allowance for three years longer on a reduced scale. In 1832 the sum of 12,000£ was voted; 8,000£ in 1833; 4,000£ in 1834. The Society has been compelled to reduce the salaries of its missionaries in that quarter, and in 1837 was compelled to sell 10,000£ of its funded property to meet deficiencies. Previous to 1823, the ‘Society for promoting Christian Knowledge’ expended a portion of its income in missions in South Africa, but in that year this department was placed under the Baptist Society. The number of missionaries now employed is 231, of whom 160 are employed in British North America.

2. Baptist Missionary Society. 1837-8. Receipts, 22,416£; expenditure, 20,622£. The cost of maintaining missionary stations in the following countries, in 1837, was—Continental India, 4,237£; Ceylon, 3,901£; Java, 3,484£; Sumatra, 101£; Jamaica, 742£, and 250£ for chapels in the same island; Bahamas, 1,249£; Honduras, 380£; South Africa, 271£. At these and the various sub-stations in connection with them, 59 missionaries, 44 native preachers, and 59 schoolmasters were maintained. In 1835 the Society received a legacy of 5,741£.

3. London Missionary Society. 1838. Receipts, 70,255£; expenditure, 76,818£. Disbursements in 1837-8 on account of the following missions:—South Sea, 10,337£; Malacca, 198£; Singapore, 206£; Penang, 972£; Java, 4,637£; Northern India, 699£; Southern India, 16,104£; Russian Empire, 5,521£; Corfu, 1,071£; South Africa, 881£; Mauritius, 426£; Demerara, 384£; Berbice, 534£; Jamaica, 749£. Of the amount raised by the yearly contributions, 13,771£ were specially subscribed for seventeen different objects, of which 4,001£ was for a South-Sea mission-ship; 800£ for exploratory voyages; 1,451£ for female education. The sum of 4500£ was received from government in aid of school-houses in the West Indies. The Society, at 455 stations and mission-houses, maintained 11 European missionaries and assistants, of whom 135 are missionaries, and 32 European and 473 native assistants. The number of churches under their care is 93, with 7,347 communicants, and 598 schools contain 36,374 scholars. The Society possesses 17 printing establishments.

4. Church Missionary Society. 1837. Receipts, 72,301£; expenditure, 91,433£. The West African mission was maintained, at a cost of 4014£; South Africa, 1705£; the Mediterranean missions (including Malta, Cypros, Atho, Minor, Egypt, and Abyssinia), 6,558£; North India, 11,528£; South India, 8,472£; Western India, 2927£; Ceylon, 3987£; China, 491£; New Zealand, 12,754£, including the purchase of the New Holland Island, 272£; Jamaica, 921£; Guiana, 143£; Trinidad, 359£; North-west America, 1945£. At 92 principal stations, 68 English and 16 Lutheran clergy are maintained, and 81 laymen and 3 female Europeans, besides 5 native clergymen and 325 laymen, and 18 female teachers, making 541 individuals. Number of schools 441, attended by 21,591 scholars.

5. Wesleyan Methodist Missionary Society, 1837. Receipts, 84,584£; expenditure, 71,274£. The number of missionaries employed was 214; catechists and readers, 3176£; salaried teachers, 295£; gratuitous teachers, 3336£; making the total number of agents 7121. The number of members in society was 66,629, and 45,338 children and adults attended schools; the number of schools granted, for erection or maintenance, was 156; under the care of the Society in foreign parts being 116,167, as far as could be ascertained. In 1837 twenty donations were received of 500£; fourteen of 1000£; six averaging above 360£ each, and one anonymous gift of 2000£. The sum of 3646£ was received to defray the collection of a fund of 2000£ from the town of Leeds. In 1818 a legacy of 9996£ was received. Expenses of stations:—Ireland, 3535£; France, 2165£; Spain, 944£; Ceylon, 6412£; Continental India, 5451£; New South Wales, 1869£; Van Diemen’s Land, 2292£; New Zealand, 2323£; Friendly Islands, 331£; South Africa, 856£; Western Africa, 3959£; West Indies, 22,000£; British America, 9000£. During the year the Society sent out 45 missionaries, 17 of whom went to Australia in 1837.

6. Missions of the Church of Scotland, 1837. The mission under the direction of a committee of the General Assembly is at present confined to the department of general, scientific, and religious instruction, and has seminaries at Calcutta and Lahore, and a college at Truro. Its object is to teach at Calcutta upwards of 700 boys and young men, of all classes and castes, are taught the common branches of education, algebra, mathematics, and other sciences. At Bombay a 'society' has been formed for the education of Hindu boys, and there is also a school at Poona, in the same presidency; and in 1837 a school was established at Madras. The funds received in aid of the Assembly’s missions average about 4000£ a year.

A society recently been established at Graham which has sent missionaries to Caffraria. The ‘London Corresponding Committee’ is an auxiliary of the General Assembly, and about 500£ a year are raised in it for foreign missions. Missionary operations have commenced at the Cape of Good Hope, in connection with the Church of Scotland.

7. Missions of the United Brethren, 1837. These missions have long been held in high estimation in England, and about 4500£ are annually contributed here for their support, under the direction of the ‘London Association.’ The number of missionaries employed by the Moravian Brethren has been increased from 155, in 1817, to 237, in 1838. A sum amounting, on an average, to 12,000£ a year is raised for their support, of which 590£ is received from persons of other denominations. About 50,600 souls are under the care of the Brethren, namely, 44,000 negroes in the West Indies, 3600 Hottentots and Caffres, and 3000 natives of Labrador, Greenland, and North America. Most of the societies publish periodical accounts of the state of their respective missions. The last Annual Report of the Church Missionary Society shows that about 2500£ had been expended in preparing and publishing these works, viz., for 12,280 copies of Annual Report, 20,000 abstracts of do., 145,500 of ‘Missionary Record, 691,375 of ‘Quarterly Paper,’ and 3650 copies of the ‘Missionary Register.’ The London Society’s expenditure under the same head was 1734£, and others in proportion; but it is by this extensive dissemination of missionary intelligence that the public have been brought to entertain so strong an interest in missions. The exertions of other missionary societies are noticed in the following section.

Geography of Missions.—In the Thirty-eighth Report of the Church Missionary Society it is observed that each mission is marked by various degrees of ignorance and knowledge. There is a kind of graduated scale, measuring the condition of the nations with which the missions are connected, and even the sovereign is only learning to spell; advancing further, to the New Zealanders, who are just beginning to catch the most elementary ideas of the Scriptures; thence to the Polynesians, who can explain but useful studies of the negro on either side of the Atlantic; then the semi-civilised tribes of South America, and, yet imperfect modern literature of the eastern regions of the Mediterranean; thence, rising higher still, to the varied
requirements of India; and, highest of all, to the establishment and improvement of native schools of Calcutta and other parts of Bengal. Under fourteen heads we give a view of the missions of all the principal societies.

1. Western Africa. Stations at Sierra Leone, Bathurst, Cape Coast, Cape Palmas, Freetown, Kissin, &c. Stations of the General Missionary Society, 52; 7 European clergymen and laymen employed, and 19 native teachers; communicants, 90; schools, 24; scholars, 3663; baptisms, 91; candidates, 657; average attendance on public worship, Sunday morning, 3859—afternoon, 1880—week-day evening, 1886. Wesleyan Missions, 45; 54 European clergymen and laymen employed, and 15 native clergymen, communicants, 1923; readers, 247; scholars, 2924 members in society, and 1495 children and adults in the schools. At Macarthy Island, 300 miles up the Gambia, 500 individuals have been baptised. A grammar in the Mandingo language has been printed, and also the Gospel of St. Matthew in the same language. The 'Foulah Mission Institution' is intended to promote the temporal as well as the spiritual welfare of that people. The 'German Missionary Society' has established a mission in the Asante country, and the 'American Episcopal Missions' one at Cape Palmas, to which three missionaries have been appointed, who are intending to establish a superior school. The 'American Board of Missions' has a station in the same quarter, where a printing press is at work to supply the wants of the settlers, and where children are docile, and learn to read with tolerable ease in three months. The 'American Baptists' have also missionaries employed in this part of Africa, which is also the scene of the labors of the American Colonization Society.

2. South Africa. The United Brethren employ 45 missionaries amongst the Hottentots, Cafrres, and Tombokikes. At the settlement of Genadendal the natives are employed as smiths, waggon-makers, carpenters, tailors, and makers. In the Transvaal, the inspector-general of schools is teaching reading and writing to 500 children. A school for girls is being taught in the female schools. Infant schools have been established. Amongst the Tombokikes many of the women have begun to wear gowns; some of the men have planted wheat, and manured their land. The London Missionary Society has 18 European missionaries, 18 native assistants; 18 churches, 1368 communicants, and 4721 scholars. This statement includes the stations amongst the Cafrres, Griquas, and Namaquas, and others beyond the color line. The schools amongst the Hottentots are encouraging; the work is rapidly improving in a knowledge of agriculture, and many of them lead a moral life. The Bechuanas are said to be most anxious in their desire after knowledge. Wesleyan missions: 21 missionaries, and 24 schools attended by 435 children. There is a press at Capetown, and amongst the Cafrres and Bechuanas; the number of members in society is 1281, and 1589 children attend the schools. The missionaries use the Sichuana language, and several elementary books have been printed at Capetown. The London Missionary Society has four principal stations in South Africa, north of the Orange river. The French missions state that amongst the Bechuanas the progress of conversation has been very slow, and that the chiefs impede this work as much as possible: but their hopes are in the rising generation. Amongst the Basuto-Bechuanas many adults have learned to read, and both men and women have clothed themselves in the European manner. The Rhemaans and the Vaal are chiefly interested in the colonists of the Cape of Good Hope, as well as in organising schools. The American Board has four stations in the neighbourhood of Port Natal, and the missionaries have set up a press for printing tracts and books, which will be supplied to the various stations. The Baptist Society has only lately commenced missions in South Africa.

3. African Islands. Madagascar. In 1835 the work of missions was making considerable progress, when an edict was issued by the king commanding all the territory to be brought under the rule of the church. A few converts afterwards met in secrecy on a mountain, for the purpose of reading the Scriptures and other religious exercises; but the practice becoming known to the authorities, sixteen were apprehended, one of whom was a superior mind named Razafarava, who was put to death, after having been flogged with great severity, in the hope that she would make a confession of the names of her companions. She met her death with firmness and composure. There have been other martyrs, and no instance of apostasy has yet been recorded of the Christian converts. A large number of Chinese are still in bondage, and the queen proposed to put them all to death, but was dissuaded by her officers. No change in this state of things is expected at present.

4. Inland Seas. The Red, Mediterranean, Black, and Caspian seas. In the Caspian sea, 11,850 square miles, the Baptist Missionary Society has a press, at which, in 1837, 25,338 copies of tracts and other works were printed in the Greek, Arabic, and Turkish languages. The Wesleyan Charity Society has also a station at Malta. In the kingdom of Greece above 1100 people, comprising persons of all ages, from 12 to 80, are engaged in the work of the church through the instrumentality of missions. The Missionary Board has stations at Athens, Argos, and Atriopolis in Laonisia, and the missionaries are employed in preaching, and in the publication and distribution of tracts, and in establishing schools. In 1837 above 17,000 copies of books, containing 161,427 pages, were printed at Athens at the expense of the mission. American Episcopalian Missions. —Schools have been established at Athens, which are attended by above 600 scholars. The mission family comprises 40 souls. So successfully has the work of education been conducted in the mission seminary, that applications have been received by the hands of the mission from Constantinople, Asia Minor, Moldavia, &c., to take under their care the youth of these cities. Five male and eight female Greek teachers are employed. In the island of Syra the Episcopalian (American) Missions have a printing establishment, which, in 1837, issued 29,000 copies of thirteen publications, varying in size from 6 to 438 pages each. This station is also a station of the same society. The state of education in this island is deplorable, and scarcely a copy of the Scriptures is to be found. Corfu is a station of the London Missionary Society, and their missionaries perform the duties of imprints in the Ionian Islands. The British government has recently ordered books to be printed for a regular course of instruction in the Latinian schools of the Ionian Islands. The American Board has established schools at Constantzopel, attracting the Greeks and Armenians of that capital, and endeavoured to excite among them a religious spirit; but these efforts have met with great opposition.

Asia Minor. —The exertions of the Church Missionary Society to establish Greek and Armenian schools at Smyrna have been unsuccessful, the Armenians declining their services, and the Greek hierarchy warmly opposing them. In the meantime the missionaries are preparing useful and scriptural books in the Turkish language. The American Board at Smyrna, at which 12 missionaries are at work, has printed 25,618 copies of thirty-eight different works in modern Greek, besides copies of works in Armenian, including a new version of the Armenian Testament. Two magazines, in Greek and Armenian, are published, of which the last was published; but an interest has been excited on the subject of education, and the missionaries at present chiefly direct their attention to the distribution of books in Asia Minor.

Egypt. —The Church Missionary Society has established schools at Cairo, which are mostly attended by Copts. There are 114 scholars in the female school, in which needlework is taught, and reading and writing.

Albysinia. — In consequence of the opposition excited against the servants of the Church Missionary Society, they have been obliged to return to Cairo. The mission was encountering considerable difficulties, when the arrival of an Indian priest and a Frenchman, for the purpose, it is understood, of reviving the Roman Catholic mission in Abyssinia, considerably increased the clamours against them. The Italian priest afterwards penetrated to Gondar, and opened a communication with the king of Shoan. The ejected missionaries had procured a firman to the king of Shoan, and at the latest account are still in Persia. —The American Board sent a mission to the Nestorians in 1835, with instructions to form a station on the western side of the Kurish Mountains. One of the objects of the mission is to improve education. There are 38 stations, of which 26 are at villages which are taken from different Nestorian villages; a Sunday school has been established; and a fount of Syro-Chaldaic type has been received; but the Board has not been able to find a printer to undertake this department of the mission. A physician is attached to the station, who is besides

Vol. XV.—2 N
to the people from all quarters. The American Episcopal Missionary Society is on the point of sending a missionary to Northern Persia, Syria, and Palestine: the American Board has stations at Beirut and Jerusalem, and service is performed in the Arabic language. Twelve pupils belonging to the Maronite, Greek, Greek-Catholic, and Armenian churches, with two Protestants and a youth of Jewish descent, are receiving education in the Missionary School, and are associated with a view to future usefulness in the missionary cause. The female school is attended by 25 pupils. The missionaries state that a female boarding-school might be advantageously opened at Beirut. At the press 16,200 copies of seven different works were printed in 1837 for distribution. At Jerusalem a small native congregation has been formed. Male and female schools have been opened. The demand for books is said to be increasing in Syria and Palestine.

Asiatic Russia.—The stations of the German Missionary Society were abolished by an ukase of the emperor in 1837. Siberia—conversions have been rare in this quarter. The London Missionary Society has a station 160 miles south-east of Irkutsk, and another at Khoton, where a press has been established. The Bible is now printing; and there is a third station at Oma.

Mohammedan Missions. A visit to Persia has induced Mr. Merrick, of the American Board, to form an opinion that missions to Mohammedan countries are at present premature, and it is recommended that the work should be confined to the character of the Oriental churches, whose condition degrades Christianity in the eyes of the followers of Mohammed.

China and India beyond the Ganges.—In China the difficulties in the way of missionaries obtaining access to the country have been latterly rather increasing than diminishing: the frontier stations are therefore regarded with great interest by the friends of missions. Most of the principal missionary societies throughout the world have stations in India beyond the Ganges. The Catholics are the only European missionaries who preach Christianity in the interior parts of the Chinese empire. The London Missionary Society has not yet been able to fill the vacant station at Canton. The Baptist Missionary Society has a station at Malacca; and at the latter place service is performed every Sunday to a crowded congregation of Chinese. In 1837 the number of Chinese baptized was 29; and there were 295 boys and 115 girls in the Chinese, and 70 boys and 20 girls in the Malay schools. The Chinese girls' schools are entirely supported by the sale of useful and fancy articles sent from England. The number of students in the Anglo-Chinese college is six, besides Chinese youths. Above 30,000 copies of the Scriptures, or portions thereof, and religious tracts and pamphlets, have been sent annually to two missionaries but no native communicants. Five Malay schools contain 111 scholars, and 11 Chinese children are under instruction. The issues from the press at Penang, in 1837, were 12,500 publications in Malay; and the circulation of the press at Singapore is by no means small. The British and Foreign Bible Society has, in cooperation with the London Missionary Society, established a station at Penang. Both the British and Foreign Bible Society and the Baptist Missionary Society, which at present send missionaries beyond the Ganges. The former Society has stations at Akyab, an island 450 miles south-east of Serampore, and at Chittagong; and the latter has one missionary at Singapore, who is studying the Chinese and Malay languages.

6. India within the Ganges.—This quarter is by far the most important field of missionary exertion, and the moral obligation to convey religious instruction to nearly 130,000,000 of people under our dominion has been deeply felt in Great Britain for many years. Since 1813, 1,100 of the missionaries have been sent out for the American and many of the European societies. It is difficult to separate the exertions of such institutions as the Bible Society from those societies whose exclusive object is the conversion of the heathen. The British and Foreign Bible Society has sent out missionaries to 11 parts of India, either in grants of books or paper, or for the purposes of translation; and the Scriptures have been printed in all the principal languages and dialects of India. The 'Christian Knowledge Society' has sent funds for the erection of churches and mission-houses, and presented deposits of books and lending-libraries, and has supplied the materials for furnishing schools and printing-offices. The Prayer Book and Homily Society has sent out its translated works. The Religious Education Society distributes annually an immense number of its publications in the two principal languages; and there are also several important local institutions which are engaged in promoting education, and are conducted more or less in a spirit of missionary cooperation. The American Baptist Missionary Society has established a mission college at Calcutta in 1829; and it has established missions in connection with the college in the neighbourhood of Calcutta and Cawnpore. The Society has a mission at Veperry and a grammar-school. A number of native teachers are instructed to be an example in a mission school. The College at Calcutta and Madras 22 missionaries and 11 catechists are employed. In the last report of the Church Missionary Society it is stated that as regards the extension of Christianity in India the great object is the difficulty of finding willing candidates. In the last report of the Church Missionary Society it is stated that as regards the extension of Christianity in India the great object is the difficulty of finding willing candidates. In the last report of the Church Missionary Society it is stated that as regards the extension of Christianity in India the great object is the difficulty of finding willing candidates.
their time to translating and publishing the Scriptures, and improved versions are in progress; and in forming and superintending schools, from many of which native teachers and preachers proceed to aid in the work. A few individuals are annually baptized by the Church Missionary Society. In Northern India, extending from Calcutta to Agra, and including Benares, there are 12 stations, at which fourteen missionaries are employed, two native missionaries, two catechists, forty-one native and Eurasian teachers. Communication from Calcutta and Madras is by the regular mails. Worship 1111; schools 63, scholars 3844, chiefly boys. The bishop of Calcutta states that the education of youth on Christian principles has "loosened the chains of Hinduism." The Western Indian Mission has its principal stations at Bombay, Merut, and Madras. There are twelve stations in India, with 41 teachers under instruction; and, as at Calcutta and Madras, there is an institution for the purpose of giving a superior education to young natives who give promise of becoming useful missionary labourers. At Nasseuck there are schools for 357 boys and 89 girls. The missionaries endeavour to promote their object by discussions, conversation, and preaching. The South Indian mission includes Cochin, on the Malabar coast, and Madras, with the stations in the Tinnevelly mission;—missionaries employed 11, catechists 4, native teachers 141, schools 314, scholars 149, scholars 4634. Of the Palamcottah station it is stated that the congregations are increasing, "but the new comers are evidently influenced by worldly motives," and should the mission be abandoned, it contains only 6 Communicants. The conduct of the converts "differs in very few respects from that of the heathen, except in the outward mode of worship." The German Missionary Society had recently a missionary in the Tinnevelly district. London Missionary Society operates at Chatham, Chasagurum, Tamoora, Berhampore, Benares, Mirzapore, Surat, Belgaum, Bangalore, Salem, Coimbatore, Travandrum, Nagercoil, Neyyor, Combononum, Chittore, Madras, Cuddapah, and Vizagapatam. Number of stations and out-stations 316, natives under the power of the gospel 3173. The American Mission has stations at Trichinopoly and at Nelsei. In the year 1845, 293. These numbers refer to the territories of the East India Company and those of the protected states. It is stated that the natives who become acquainted with English are much more favourably disposed than those who remain ignorant of it. At Chittore, however, the natives are taught Christian books; now there are 12 boys' schools on Christian principles. The prejudices against female education are rapidly giving way. In the Travancore district, in an area of 450,000 square miles, about 60 per cent, are Christians, are connected with the mission. In the Semangal district, 360, for training native missionaries, four of the youths read the Greek Testament with facility. The effects of missions in the district of Chittore are favourably displayed in the habits and conduct of the natives, many of whom, in place of resorting to asceticism, are engaged in honest labour, but 'spirituality is scarcely visible.' At Madras the native congregation consists of 80 persons, of whom 35 are communicants. General Baptist Missions—At Cuttack and five other places within 35 miles of Calcutta; 33 communicants, but this number includes Europeans. At Cuttack a printing-press has been set up, at which 10,000 hymn-books, 20,000 tracts, 2000 Baxter's 'Call,' and 4000 'Pilgrim's Progress' have been printed. Wesleyan Missionary Society—At Trichinopoly, a division of the Indian mission, 20 schools, 3000 scholars, with 70 missionaries and scholars. The mission has occasionally been given in Telogos. Church of Scotland Missions—The nature of their labours has already been described, and statements given showing the great importance of their schools at Calcutta, Bombay, and Madras. The German Mission in the North, which has already received support from the Diocese of Mysore country, Nagapetam, and Madras, each of which embraces an extensive district; missionaries 12, assistant-missionaries 7, salaried teachers 24, members 346, scholars, chiefly Hindus, 1375. The gospel is preached in English, Tamil, and Telogos. The report that religious schools are established all over the island; thousands of tracts in four different languages are distributed every month, which are said to be eagerly read; schools might be increased to any extent; discussion on religious subjects is almost universal. The evangelization of the island engages the anxious attention of the Society. American Board of Missions—stations and out-stations 13, missionaries 6, native preachers 4, native assistants 71, physician 1, printer 1, female assistant-missionaries, being wives of missionaries, and the mission has been performed in the Tamil and Singalese languages. Since 1823 above 100 youths have been educated at the mission semi- nary. The increasing knowledge, experience, and stability of the native agents is regarded as the most promising feature of the mission. Wesleyan Missions—The Ceylon mission is conducted in two divisions, the Singalese and the Tamil, the northern part of the island being inhabited by a distinct race professing Buddhism, and the south by Hindu idolaters and Mohammedans. Stations in the Singalese division are at Kandy, Galle, and Aden. The European and Ceylonese members of the 50 mission—salaried teachers 59, members in society 656; scholars, adults, and children, 4471. In the Tamil division there are 4 stations, 8 missionaries and assistants, 37 salaried teachers, 139 members, and 2136 school children. To the missionary Society, the Ceylon mission has been added. In sixteen places of worship, average attendance 2700.
persons, communicants 330. In 187 free-schools there are 4732 male and 1044 female scholars, besides 151 in the male and 98 in the female boarding-schools. The press gives employment to fifty natives. A few years ago the only tracts distributed were written on the oil, and a single writer could only make four or five copies a day. In 1837 the number of pages printed, of tracts, of the Scriptures, and other works, was 12,430,000. This mission being in some difficulties in 1837, the governor, in his annual capacity, sent a document in the Dutch language, containing the high sense entertained of the services of the mission in the northern provinces.

8 Indian Archipelago.—In August, 1837, a regulation in reference to foreign missions in these seas was issued by the Dutch government, that no mission from any foreign country shall be permitted to establish itself anywhere in the Netherlands Indies, excepting on the island of Borneo, this permission to be granted only to Netherlands missionaries, under restrictions hereafter to be made. The authorities on the west, south, and east coasts of Borneo are called upon 'to advise the government what progress the missionaries have made there, and to give their opinion whether or not it is advisable that more should be admitted.' The Netherlands Missionary Society employs ten missionaries in the Netherlands Indies. There are two stations at Sumatra, one at Rhio, one near Batavia, also one at Timor Couping, one at Makassar, and one at Moa; at Litty and Ambony there are two at each; and there are stations at several other places. In Celebes numerous numerous numbers of missionaries have been sent, and in the town of Borneo there are some German missionaries, who have no connection with the Netherlands Society. The Moluccas have not been considered as a profitable field for missions. About twenty years ago the Bapists had a missionary station at Batavia, but the mission was put down by the Dutch government, and many tracts and books distributed: but the missionaries removed to India on the island coming into the hands of the Dutch. The London Missionary Society has a station at Batavia, where two schools have been opened for Chinese youths, and one for Malays, and a printing-press has been actively employed. The American Board supports four missionaries at Borneo, and the American Episcopalian Missionary Society has a station at Batavia.

3. The Church Missionary Society has a station at Wellington Valley, 240 miles north-west of Sydney, where, at different times, more than a hundred of the aborigines have been under instruction. Several have learned to read. The native vocabulary has been revived and enlarged. A newspaper, The Gospel of Schools, is published, which contains the whole of the morning and evening services of the Church have been translated. Service is performed in this language every Sunday. 'In the seed-time natives attended at the church on Sunday, or morning and evening, and on other days when they were employed in return to the school by the education afforded them. The Mission has been well received and approved by the government and people, especially by the Catholics. The Mission is under the supervision of a missionary, and is conducted in a manner which has been approved by the government. The Church Missionary Society has also a station at Biloela, which is a mission station and a printing-press is in operation.

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country studded with lakes, and united with each other by channels full of rapids and small cataracts. The surrounding country consists of an alternation of small eminences and swampy ground. The elevations or ridges are composed of alluvial sand, the lower levels and the bottoms of the larger valleys are waterlogged, and are overgrown with pine-trees. In the swampy flats and other places grow, especially hemlock, elm, and ash, which are covered with moss. In some parts small prairies occur.

Issuing from Lake Winnipee in a southern direction, the Mississippi continues to traverse the region of lakes. The country in which this part of its course lies is similar to that about its sources. The river here flows with great velocity, and forms several small falls. In some places the river is skirted by narrow strips of alluvial soil, subject to inundation, and in others its bed is already wide enough. A number of islands, especially above the Big Falls, where twenty islands occur in the space of four miles, called the Beaver Islands. Nine miles above the place where the Mississippi is joined by its first great affluent, the St. Peter's river, which falls into it from the west, one large body of water occurs, the St. Anthony's Falls. The Mississippi, though considerably narrowed by the rocks, is about 640 yards wide at this point. In the middle is an island about 100 yards wide, and covered with trees. The fall on the eastern side is 230 and that on the western side 180 feet wide, and 60 feet high, but height 16 feet. There is a considerable rapid both above and below the falls, and goods must be carried over a long portage. The difference of level between the places of discharge and the lake is fifty-eight feet. For several miles farther down rapids occur. The falls of St. Anthony may be considered as the point where the Mississippi terminates its upper course.

From the Falls to Lake Pepin the river winds through a country of prairies, which is rather level than hilly, the elevations being of moderate height, and seldom attaining 200 feet above the level of the water. The valley through which the river runs is now more regular and uniform in width; but the river itself is winding, and the small islands, which are connected with one another by sand-bars, are succeeded by sand-bars, and the current is rapid. At Lake Pepin commence the bluffs, or wall-like high grounds, which generally run parallel to the course of the river, and at some distance from it. Lake Pepin, in most parts, nearly up to the edge of the bluffs, is overhung by wood. Below Lake Pepin the vale of the Mississippi varies from 3 to 10 or 12 miles in width, except at Rock Island and Des Moines Rapids, where it is only wide enough to receive the river with some ease. At the last-named point there occur a short distance above the mouth of Rock river, the bed of the Mississippi is contracted to 800 or 1000 yards; and at the Des Moines rapids, which are near the mouth of the Des Moines river, it is only 1000 yards wide. At Rock Island Rapids the river descends 44 feet in a distance of 15 miles; and at Des Moines Rapids 30 feet in 11 miles. In many places the river occupies half the vale, spreading out to the width of five or six miles, and appearing to lose itself among numberless islands, between which it runs in narrow channels, and is only 1000 yards wide.

The sources of this river are two small lakes, situated in 47° 10' N. lat., and between 95° 30' and 96° W. long. The western, called Lake Itasca, is about eight miles north of the eastern, which is called Lake Kitchi-igan. The two lakes are about two miles distant from each other, and are studded with islands. From each of these lakes a small stream issues in a northern direction, which unite, after a circuitous course of about 150 miles, near that of the upper Mississippi falls into Lake Travers, which is about 12 miles long from north to south, and six or seven broad, and is the most northern point attained by the river. Issuing from the eastern side of this lake, the river flows south-eastward to Council Bluffs, a distance of six miles, and then another direction to Little Winnipee Lake, from which its south-eastern course begins. Up to this point its course lies through a
cinity of Lake Pepin, isolated knobs and hills of considerable magnitude, based upon horizontal strata of rocks, and rising to various heights, frequently occur. These hills appear to be the remains of the elevated tract through which the river has scooped out a broad and deep vale. This level is covered with an alternation of prairies and forests. The prairies are generally elevated a little above the floods, and richly carpeted with herbage and flowers: the woods are dense and high, and afford a fine cover of growth of trees. Between the Falls of St. Anthony and the mouth of the Mississippi river the Missouri receives no considerable affluent from the west, except the St. Peter's river; from which, when it joins it, it is joined by the Croix, Wisconsin, Rock, and Illinois rivers. At the mouth of the Missouri the middle course of the Mississippi terminates.

Below the mouth of the Missouri, the river and the vale through which it flows present different features. The river, less in width, has a more imposing aspect, flowing with a comparatively gentle course, in one sheet of water, rarely interrupted by islands. The only serious obstruction to navigation occurs about 30 miles above the mouth of the Ohio, where two bars of limestone, called the Big and the Little Chain, extend across the bed of the river, and are low state of the river these bars have little water on them, which circumstance, added to the rapidity of the current, renders the ascent of vessels very difficult. The vale widens more and more as it proceeds southward. It consists of an alluvial plain, which is bounded on the west by the low bottoms partly covered with swamps. Both are of great extent, and are generally opposite to one another, so that when the high ground approaches the banks of the river on one side, extensive bottoms skirt them on the other.

The most northern of these bottoms, called the American Bottom, begins four miles above the mouth of the Missouri, on the eastern bank at the Piasa Hills, and extends to the mouth of the Kaskaskia river, a distance of seventy miles in a straight line. It is several miles wide, and has a soil of astonishing fertility, consisting of comparatively recent deposits from the river. Its surface however slopes, as is common with this kind of land, from the river to the high land. The banks of the river on this flat and along the valley of these high lands are pools of stagnant water, which render this fine bottom unhealthy. Opposite this bottom, on the west side of the Mississippi, the high lands approach the river, presenting abrupt declivities, prominent points, and in many places perpendicular precipices from the water to the two hundred feet high. The country at the back is partly wooded and partly prairie. These high lands continue along the right bank of the Mississippi somewhat farther than Cape Girardeau, north of which place they attain their greatest elevation. Between Cape Girardeau and the mouth of the Kaskaskia river and that of the Ohio are also high lands of inferior elevation, but about thirty miles above the mouth of the last-mentioned river the banks begin to be low, and continue so to its very mouth. Its soil consists of recent alluvial deposits covered with dense forests: the width is about 10 miles.

This low alluvial tract continues south of the mouth of the Ohio for about seventeen miles, where the river runs at the base of the Iron Banks, which rise nearly perpendicularly about 130 feet above the level of the river and are annually wearing away by the action of the water, which sets strongly against them. From the Iron Banks southward, bluffs less than 200 feet high skirt the banks of the river as it winds through a valley of a hundred miles in width, ground about 30 miles long and from three to four wide, which lies between 36° 30' and 36° N. lat.; it is a swarm covered with high trees, and hence called Wood Swamp. South of it some bluffs attain an elevation of 200 or 300 feet, which rising hills are covered with fine forestation, and support a fine country opposite this high bank, on the west side of the river, is low. It begins on the north, about ten miles below Cape Girardeau, with the Tywapa Bottom, a fine tract of wooded country, and extends to the mouth of the St. Francis river, a distance of more than 160 miles in a straight line. Its width is more than fifty miles, and its western side is skirted by bluffs of moderate elevation, which, for a considerable distance, run along the western banks of the Black River, nearly parallel. This extensive tract is traversed in all its length by the St. Francis river, which is joined not far from its source by an offshoot of the Mississippi, by which, during the time of the freshets, a great volume of water is poured towards the middle of the plain, so that the greatest part of it is inundated, and a considerable extent is a swamp all the year round. This swamps tract, extending on both sides of the St. Francis river, is called the Great Swamp. The country is unhealthy, and covered with a continuous forest.

On the south, this low region borders on another, which is not much elevated, but presents a fine and level surface, and is covered with a thick growth of trees. The only obstacle to navigation is about 20 miles above the mouth of the St. Francis river, and runs through the low country in a southern direction. This branch is called, at least in its lower course, Bayou river, and falls into the Yazoo river about 20 miles from its mouth. Its surface is entirely level, but is only passable, and it is only along the watercourses which flow through it that the banks are dry for several months in the year. On the east it is bordered by a much more elevated tract, which is generally wooded on its margin, but farther back it is level and open.

South of the mouth of the Yazoo river, the bluffs on the eastern bank of the Mississippi re-appear, and extend west of Baton Rouge (about 30° 30' N. lat.). In some places near the river the bluffs are high and precipitous, forming a distinct separation from the bed of the river, but their bases are made up of sand and gravel, and are only covered by its waters. As in the other bluff region, the surface of this tract is intersected by numerous watercourses, which give to it the aspect of a hilly country: but at the distance of about 3 miles from the Yazoo, the surface becomes a level plain. The bluffs themselves rise rather steeply from 100 to 200 feet above the bed of the river. Opposite to the bluff region is another lower and generally swampy tract, which is traversed by the Tensas river, another outlet for the abundance of waters of the Mississippi, during the freshets. It is from 20 to 30 miles wide, beginning north of 31° N. lat., and extending southward to the mouth of the Red River and the efflux of the Atchafalaya branch of the Mississippi, where it is connected with the extensive low regions of the Mississippi. This part of the basin constitutes the most southern portion of the vale of the Mississippi, is more particularly described under Louisiana.

The Mississippi falls into the Gulf of Mexico by several mouths, after a course of more than 3100 miles; but if we consider the form of an earth-wall several miles wide, the whole course is at least 4400 miles.

Countries constituting the Borders of its Basin.—The basin of the Mississippi, like that of most other rivers, is narrow near its mouth. As far north as the beginning of the bluff region, near Baton Rouge, it is confined to the inundated region of the delta. On the west of the delta are the extensive and elevated prairies of the Attacapas and Opelousas, from which the low country is separated by a narrow strip of land, about 40 miles in width. The country along the border of the basin begins to be more indented, and is covered with pine-forests. North of the red leading from Nacogdoches in Texas to Nachoche in Louisiana, the change is still greater, the surface is in a large part level, and the basins of the lakes and swamps are covered with hills several hundred feet high. Near the parallel of this hilly region the basin of the Mississippi widens greatly towards the west, running along the parallel of 33° N. lat. from the sources of the Sabine river, or from 98° W. long., to the sources of the Red River in the Rocky mountains, or to 102° W. long. The country which separates the Red River from the numerous rivers which descend into the Gulf of Mexico through the province of Texas, is only hollow and bordered about the sources of the Sabine river; farther west it has the form of an earth-wall several miles wide, level on its surface, without trees, and sloping with a gentle declivity towards the Red River. Its elevation...
above the sea is not known; towards the western extremity, about the upper branches of the Red River, it joins the wooded hills of St. Saba, a branch of the Rocky Mountains. From the source of the Red River, the long and continuous chain of the Rocky Mountains forms the western border of the basin of the Mississippi in all its extent, from 33° to 48° N. lat. (Rocky Mountains). These mountains run in a north-west direction, the western part of the basin of the Mississippi continually widens as it extends northward. Near the parallel of 33° N. lat. the river is only about 550 miles from the western border of its basin, but near 44° N. lat. it is more than 2,000 miles. Many rivers which run farther north the distance is somewhat less, as the river in these parts flows in a general south-eastern direction.

The northern border of the basin of the Mississippi begins on the east at the base of the Rocky Mountains, and the most southern part of the river is bounded by the river Saskatchewan about 45° N. lat. It does not run directly east, but in a north-eastern direction until it attains 50° N. lat., when it extends nearly along that parallel eastward to the banks of Assiniboine, a tributary of the Red River. In 101° W. lat. the river turns to the south-east, and continues in that direction to the sources of the Red River of Lake Winnipeg (about 45° 30' N. lat.) in Lake Travers. Hence it turns to the north-east on the eastern side of the Red River to Lake Itasca, then, after a short junction, it continues along the lake in that direction to 49° N. lat., from which point the river runs west, always on the southern side of Lake Superior, which is considered as a continuation of the Mississippi up to the vicinity of the Great Lakes, where it receives many branches, which sum up in 400 miles. But a degree farther south (47° lat.), it is hardly 60 miles wide from east to west. Though it descends with a precipitous declivity towards Lake Superior, its level is probably very little lower than the surface of that lake. The mouth of Lake Michigan the margin of the basin runs east to the most southern extremity of Lake Erie, whence it continues at a short distance from the southern shore of that lake nearly to its eastern extremity. From this lake it turns east-south-east, and terminates at the foot of the Alleghany Mountains, between the sources of the rivers Alleghany and Genesee, near 42° N. lat. This northern border extends from 110° to 78° W. long., a distance of nearly 1400 miles in a straight line. It is remarkable that no part of such an extensive basin as this is separated by a single mountain, and the few springs which occur are generally salt. This tract has no mountains but another body of water, a lake, of great extent on account of the rapidity of their current. Though wooded in many places, the tracts consisting of bare rock are very extensive. This region terminates on the south-west with the Oeosh Mountains, which occupy the tract between the Mississippi and the Red River. From the Minnesota to the Missouri the river is called the Des Moines, but towards the shores of Lake Michigan it descends gradually, or perhaps in terraces, as the small lakes seem to indicate, which occur at certain distances from Lake Michigan. From the south side of this more elevated region, and probably along its base, a deep depression runs across the country lying between the eastern banks of the Mississippi and Lake Michigan, in a south-western and north-eastern direction. In this depression run two rivers, the Wisconsin, coming running into the Mississippi, and Fox river, which empties itself into Green Bay in Lake Michigan. These two rivers are separated from one another by a portage of about one mile and a half across a flat meadow, which is occasionally subject to inundations, at which time it offers a water-course to the two rivers.

The mouth of the Green Bay is formed by a deep depression, and the lake is not in place more than 30 miles from the shores of Lake Michigan. As far as it is known, it consists of prairie land, mostly with a level surface and a shallow soil, in which are found few small lakes, and at some places it is separated from the lake by a margin of low, flat, and swampy ground, thickly covered with high grass; but the lake is generally skirted at a distance of a few hundred yards from its shores by a range of steep low sand-hills. The sand is loose and unconnected, and the hills appear to have been produced by the constant accumulation of sand blown from the beach by the strong north-easterly winds.

The line which constitutes the border of the basin of the Mississippi between Lake Michigan and Lake Erie is some-
what curved to the south. Along the western part of this line is a fine level plain covered only with thick grass; it is followed by a deep depression, the surface of which is swampy, and through which runs a small stream. This depression is the division between the Kasheek river, an affluent of the Illinois, and the St. Joseph’s river, which falls into Lake Michigan. Farther east the country spreads out in extensive prairies, almost destitute of timber, excepting some small brush along the borders of the Maumee river and the banks of the small lakes or ponds with which these plains are intersected. These prairies contain a great number of sink-holes or conical depressions of the surface, from 8 to 10 feet deep, and from 20 to 30 feet in diameter, but upon which live the water and the prairie grass. The Maumee river stretches a country 30 miles wide, consisting of low flat ridges, the summits of which present extensive levels, intersected with many small lakes and lagoons. They rise abruptly and with a steep declivity from the lower country to an elevation of 20 or 30 feet, sudden, uniform in height, but of unequal breadth. They are divided from each other by narrow strips of prairie land. The soil of the ridges is poor and gravelly, and covered with a thin growth of scrubby oak; it consists of an admixture of loam and clay, which, having been divided by valleys of a later origin, and these lower grounds are filled with alluvium. The remainder of the border, which skirts the southern banks of the Maumee river, is generally a swampy plain.

The western side of the eastern and the southern side of the Bay. The southern shores of Lake Erie rise to some elevation above this level, and are not swampy. Behind them the country rises gently, and with a rather level than undulating surface, and attains at the watershed between the rivers which fall into Lake Erie and that which joins the Maumee. The Maumee rises in the hills of more than 900 feet above the sea, and about 350 feet above the surface of the lake. The high grounds extend in alternate prairies and woodland, and the bottoms along the watercourses, which are considerably depressed below the level of the meadow extensions. The wide tracts are of rare occurrence on the plains. This country continues eastward to the boundary-line between the states of Ohio and Pennsylvania. The remainder of the northern border of the Mississippi basin, which surrounds the numerous upper branches of the Maumee through the midland of the shores of Lake Erie to 42° 30’ N. lat., and then turns south-east, terminating where the parallel of 42° traverses the Alleghany Mountains, at the head of Genessee river. The country adjacent to this border is very hilly, consisting of a succession of elevated ridges and valleys. The whole tract is considerably elevated above the level of the sea, as Pittsburg, which lies near its southern extremity, at the confluence of the Monongahela and Alleghany rivers, is 350 feet above the level of the sea. This extends to the middle of the county, which constitutes the watershed in this part probably rises 300 or 400 feet higher. This tract is almost entirely covered with forests.

The eastern border of the basin of the Mississippi, between 90° and 92° W. long., is formed by the Appalachian Mountains, which as they extend from north-east to south-west continually approach nearer to the bed of the river. Hence the outer border of its basin, between 40° and 42° N. lat., is about 300 miles from its bed, but at the parallel of 35° N. lat. that distance is reduced to about 250 miles. [For the natural features of this region see APPACHIAN MOUNTAINS.] Though the Appalachian Mountains cease to constitute a mountain-chain in the north-eastern part of the state of Virginia, they are a continuation of the mountain range and extend from their southern extremity, to the west-south-west, and west, and terminate on the banks of the Mississippi, north of the Chocow Swamp, in the hill called the Fourth Chuckaw Bluff. This hilly tract is mostly covered with forest, excepting the small plains which emerge from its southern declivity to the shores of the Gulf of Mexico. About fifty miles from the river this hilly range is traversed at right angles by another tract of elevated ground, which extends from about thirty miles south of the mouth of the Tennessee river, in the south-western part of the state of the Mississippi, and terminates in a long slope near the northern shores of the lakes Pontchartrain and Borgnine, which belong to the delta of the Mississippi. This elevated ground is broken and rocky between the Tennessee and the Mississippi, in the south-west part of the state it narrows to wide plains, which towards the north exhibit extensive prairies and towards the south are covered with pine forests. In this part the outer-border of the basin of the Mississippi is less than a hundred miles from the bed of the river.

COUNTRIES INCLUDED WITHIN THE BASIN OF THE MISSISSIPPI.—The countries comprised within this basin may be divided into the hilly country, the prairie country, and the desert. The hilly country borders on the east on the Appalachian Mountains, from the base of which it extends westward to the meridian 96° W. long., between the Maumee and the Lake Erie, and the swampy bottoms adjacent to its bed. Towards the south this country extends to the very borders of the basin, namely, east of the river to 35° N. lat., and west of it to between 33° and 34° N. lat. Its northern boundary, east of the Maumee, is fixed by the Maumee river, but between the Maumee and the Mississippi it is fixed by the Missouri, as far as its confluence with the Kansas river, when the latter river forms its boundary nearly to the place where its two great forks unite. The prairie region occupies the whole of the basin north of the Ohio, and also the country between the Mississipi and the Kaskaskias. The desert occupies the western portion of the basin, extending from the meridian of 96° W. long., and from the banks of the Missouri, where this river flows in a southern direction, to the border of the Rocky Mountains. We shall notice these regions briefly.

The eastern portion of the hilly region, or that which lies between the Appalachian Mountains and the vale of the Mississippi, varies in its natural features and in fertility. In the west of 96° W. long., the level of the country sinks considerably to an average distance of 60 or 70 miles from the river. Probably one half of this region is covered by forests. The hills descents, but the acclivities are gentle, and the whole region is covered with a good soil, loaded with timber in its natural state, and yielding rich crops when cultivated. To the west of 96° W. long., the level of the country sinks considerably, which is shown by the general river courses to a considerable depth. The rivers run in deep trenches, and have seldom a bottom of any extent. They flow from 100 to 300 feet below the adjacent country. Towards the south the region runs to an average distance of 60 to 80 miles from the river; the hills descents, but the acclivities are gentle, and the whole region is covered with a good soil, loaded with timber in its natural state, and yielding rich crops when cultivated. To the west of 96° W. long., the level of the country sinks considerably to an average distance of 60 or 70 miles from the river. Probably one half of this region is covered by forests. The hills descents, but the acclivities are gentle, and the whole region is covered with a good soil, loaded with timber in its natural state, and yielding rich crops when cultivated. To the west of 96° W. long., the level of the country sinks considerably to an average distance of 60 or 70 miles from the river. Probably one half of this region is covered by forests. The hills descents, but the acclivities are gentle, and the whole region is covered with a good soil, loaded with timber in its natural state, and yielding rich crops when cultivated. To the west of 96° W. long., the level of the country sinks considerably to an average distance of 60 or 70 miles from the river. Probably one half of this region is covered by forests. The hills descents, but the acclivities are gentle, and the whole region is covered with a good soil, loaded with timber in its natural state, and yielding rich crops when cultivated. To the west of 96° W. long., the level of the country sinks considerably to an average distance of 60 or 70 miles from the river. Probably one half of this region is covered by forests. The hills descents, but the acclivities are gentle, and the whole region is covered with a good soil, loaded with timber in its natural state, and yielding rich crops when cultivated. To the west of 96° W. long., the level of the country sinks considerably to an average distance of 60 or 70 miles from the river. Probably one half of this region is covered by forests. The hills descents, but the acclivities are gentle, and the whole region is covered with a good soil, loaded with timber in its natural state, and yielding rich crops when cultivated. To the west of 96° W. long., the level of the country sinks considerably to an average distance of 60 or 70 miles from the river. Probably one half of this region is covered by forests. The hills descents, but the acclivities are gentle, and the whole region is covered with a good soil, loaded with timber in its natural state, and yielding rich crops when cultivated. To the west of 96° W. long., the level of the country sinks considerably to an average distance of 60 or 70 miles from the river. Probably one half of this region is covered by forests. The hills descents, but the acclivities are gentle, and the whole region is covered with a good soil, loaded with timber in its natural state, and yielding rich crops when cultivated.
those adjacent to the Red River and the northern banks of the Arkansas, and those which extend from Cape Girardeau along the Mississippi and Missouri to the mouth of the Mississippi, as well as a tract west of the mouth of the Osage river, an affluent of the Missouri, are not hilly, but the surface exhibits broad and elevated swells of land separated from each other by wide and deep valleys. These districts are diversified with woodlands and prairies. The soil, though not generally of great fertility, is composed of loam and hardpan. At the west of the Ozark Mountains, as far as 96° W. long., resemble these districts in its surface, but the soil is much inferior; the proportion of forest is very inconsiderable, and the timber of a scrubby character. At least nineteen-twentieths of the region is prairie.

We pass to the prairie-region. Though prairie land generally prevails in that portion of this region which lies east of the Mississippi, there are extensive tracts without any prairies. Of this description is the country which extends along the northern banks of the Ohio river, and in some places 60 or 70 miles from it. It may be considered as divided from the prairies bordering on the north of this tract by a line beginning on the Mississippi river at Cape Girardeau and running in a north-easterly direction to the Miami river, and thence eastward to the Muskingum, which it crosses near Zanesville; thence its course is north-east to the sources of Big Beaver river and to Lake Erie. The tract of country included by this line and the vale of the Ohio is exceedingly diversified. Its surface is diversified by a series of hills, each about one mile and a half from the Ohio the hills rise with a steep ascent to an elevation varying between 300 and 500 feet. On attaining this elevation the country appears uneven and rough, but the hills are comparatively small, though very stony. The surface becomes more firm, but is still irregular, at the same time the soil is generally either limestone or sandstone. The general elevation of the upland grounds may be from 600 to 1000 feet above the sea-level, but this elevation decreases towards the east, and the inequalities of the surface do not render it unfit for cultivation. The valleys, especially along the principal streams, are exceedingly fertile, and the hills, though less productive, are capable of cultivation.

The country north of the above-mentioned line has an undulating surface towards the east, but no considerable hills occur. This district is entirely covered with forests. The prairies begin to make their appearance on the banks of the Muskingum river, where however they are frequently interrupted by forests, but farther west the prairies increase in number and extent, until in the neighbourhood of the Mississippi the forests are limited to the banks of the rivers.

In these districts extensive tracts occur with scarcely an undulation upon their surface. They are generally dry, and are only intersected by narrow north-north-easterly canyons, which towards the border of the basin of the Mississippi the extensive levels are marshy. The tract of land in which the rivers, which on one side fall into the Ohio, and on the other into the lakes Michigan and Erie, take their origin is low towards the south, and higher towards the north. The depression as it advances westward, being at the source of the Miami 964 feet, and between Lake Michigan and the upper branches of the Illinois river only about 700 feet above the sea-level. The valleys of the rivers in this prairie-region are generally broader than among the hills farther south, and more regularly defined, being separated from the high lands by parallel ranges of bluffs or mural banks.

The prairies extend between Lake Michigan and the vale of the Mississippi, and south to the mouth of the Wisconsin river (43° N. lat.). North of that line commences a hilly region, which extends northward to Lake Superior. This region, which is known by the name of the Wisconsin Hills, has been already noticed. The Oochoo Mountains, which constitute its western extremity, rise about 1200 feet above the Mississippi, and 2000 feet above the sea-level, and near the great bend of the Wisconsin, but on the south-east of it is an isolated mountain-mass called the Smoky Mountains, which rise to the height of 1500 feet above the sea-level, and in some parts contains a greater proportion of forest than that on the banks of the Illinois river.

On the west of the Mississippi, about the source of that river, there are extensive tracts of swamps and region of lakes which we have already noticed. South of it, and as far west as the Coteau des Prairies, the general surface of the country, which is about 100 feet above the river bottoms, is undulating. In many places tracts occur of moderate extent, covered with trees, but the prairies greatly prevail, especially near the Coteau des Prairies. This huge swell of elevated ground, which has been already noticed, is said to be followed on the west by a broad valley of prairie land, traversed by the James river, and this valley is stated to be divided from the valley of the James by a range of hills of considerable magnitude. The whole is very diversified, diversified with broad river-valleys and creeks, and intervening tracts of undulating upland united to the valleys by gentle slopes. Belts of forest situated upon the margins of the watercourses divide the whole region into prairie territories. If the tracts contiguous to the Mississippi and Missouri are excepted, at least nineteen-twentieths of the country are entirely without large trees. In some places it is covered with scrub and furs. The valleys along the rivers expand to a great width compared with the streams which run through them, but they are not bounded by abrupt bluffs, except along the Mississippi and Missouri rivers.

These valleys are generally covered with luxuriant grass and other plants, and do not contain forests of moderate extent. The soil of the uplands does not appear to be bad, but the great scarcity of timber and of springs renders them useless for agricultural purposes, except in the vicinity of the streams.

The desert, which occupies the whole basin of the Mississippi west of 96° W. long. to the base of the Rocky Mountains, has an undulating surface, with here and there a hill, knob, or insular tract of table-land. These eminences only a small part of the desert distinctly marked as we approach the Rocky Mountains. The table-lands reach from 800 to 8000 feet above the common level, and are often surrounded by rugged slopes and perpendicular precipices, which render their surfaces almost inaccessible. Their surfaces are usually waving, and in some instances broken into knolls and ridges several feet high; many of them are clothed with a scanty growth of pine, cedar, or scrubby oak, whilst others exhibit a bald or prairie surface. But these table-lands occupy only a small portion of the desert. Hills or knobs occur also frequently, and occasionally swells of greater or less extent. The country is divided into extensive parterres by the valleys of rivers and creeks, which are usually 150 or 200 feet below the common level, and bounded in some places by perpendicular precipices, and in others by bluffs or gentle slopes. Between the Missouri and the Rocky Mountains, and nearly at an equal distance from both, there appears to extend a low range of sandstone hills from south-south-west to north-north-east, which towards the north are called the Black Hills; but which are very imperfectly known and the limits of each position and extent; their surface is exceedingly broken and rugged. The surface of the east side of this range is not an absolute plain, but is diversified with gentle undulations, and the drainage of water from an immense table-land of terranes of earthen rock is supposed to have occasioned. The gradual intermixtures of the species of animals and vegetables with what was formerly a poor siliceous sand, has produced a soil capable of supporting a scanty growth of grasses, which are now the only covering of this tract. West of the range called the Black Mountains, the fine sand is exchanged for a gravel made up of rounded granitic fragments, varying in dimensions from the size of a pea to that of a man's fist, and the surface of the mountains pebbles and boulders become frequent, and at length almost cover the surface of the country. In this part large tracts occur which scarcely exhibit a trace of vegetation, and the whole desert is almost entirely destitute of timber-trees, with the exception of some sand dune knolls. Here and there the surface is thickly covered with red cedars of a dwarfish growth. In the neighbourhood of the Arkansas river the surface of the country is in many places covered with numerous fragments of volcanic rocks. The granite of this desert is not numerous as almost to cover all vegetation from springing up. Various ridges and knobs containing rocks of this character also occur in this district. There are no swamps in the desert. Its surface is generally elevated, the only depressions being those of which the desert is probably between 3000 and 4000 feet above the sea-level.

Rivers draining the Basin of the Mississippi.—The rivers which fall into the Mississippi from the east drain a country...
which is cultivable to a great extent. The most northerm on this side is the St. Croix river, which joins the Missis-
ippi near the mouth of Superior, and two other rivers of the same name, the north and south St. Peter's, from Pepin.
It rises in Upper St. Croix lake, near the head-
waters of Bois-Brûlé river, which falls into Lake Superior, and there is a portage of two miles between the streams. It flows in a general south-easterly direction over a distance of about forty miles from its source enters the Lower Lake St. Croix, which is thirty miles long, but of in-
considerable breadth. The river is navigable for about twenty miles above the lake, where it is obstructed by a rap-
\zebra\, but it is sufficiently deep for load-
\zebra\.

Its course exceeds 120 miles.

The Wisconsin or Ouissconsin river rises in the centre of the mountain-region called the Wisconsin Hills, through which its course is in a general south direction for about 180 miles. Where it approaches the sources of the Fox river of Green Bay, it turns gradually to the east, and its course in this direction also is estimated at 180 miles. When swollen it is navigable in the lower part of its course for boats of considerable burden, but at the time of low water its navigation is obstructed by shoals and sand-
\zebra\.

Its valley is rather narrow, its course rapid, and its bed studded with many islands. Its connection with Fox river of Green Bay has been already mentioned.

At 44° 24' N. lat. and on the western shores of Lake Michigan, and runs in a south-western and western direction about 300 miles, falling into the Missis-
nippi near 41° 30' N. lat. It is only navigable for small boats. Not far from its head a natural water-communica-
tion runs between it and Manawakee river, which falls into Lake Michigan.

The Illinois is formed by two branches, one of which, the Kankakee, drains the country immediately adjacent to the southern extremity of Lake Michigan, and runs westwards; the other, the Plane river, runs at a short distance from the western shores of the same lake. Both rivers are navi-
gable for boats, and have a natural water-communication with Lake Michigan. Between the Plane river and the Chicago river there is a low tract which is inundated during the flood season, and this season frequently passes over it, and there is a project for forming a canal in this tract from the Illinois to Chicago. Kankakee is united by a swampy tract not far from its head to St. Joseph's river, which falls into the eastern side of Lake Michigan. This lowland is covered with water during the spring floods, and then also is passable for boats, but it is not much used. Both rivers unite after a course of about 70 miles, and form the Illinois, whose waters are soon increased by the Rock river from the west, which also flows down the same stream, and is navigable for a considerable distance. Some miles below its mouth there are rapids in the Illinois which are utterly impassable for boats except in time of flood. At this place the projected canal is to commence. Below the rapids to the mouth the Illinois is navigable for the most part, its navigation is easy for boats of moderate draught and burden. The current is exceedingly gentle. The river valley is broad, and bounded by parallel bluffs; the bottoms are covered with dense forests, and the upland prairies have an undulating surface, covered with rich grass and herbage. Among the tributaries in its lower course the most important is the Sangamon, which comes from the east, and is said to be navigable for more than one hundred miles.

The Ohio, the largest and most important of the eastern affluents of the Missouri, is formed by the confluence of two rivers, the Alleghany and Monongahela. The Alleghany rises in several branches south of the eastern extremity of Lake Michigan, and the Monongahela in one branch opposite the Alleghany, rises in Virginia, in the Laurel ridge of the Appalachian Mountains, and runs north-
\zebra\: its course may be about 200 miles. These two rivers, uniting at Pittsburgh, form the Ohio, whose course from the confluence of the Alleghany with the Monongahela, direct line, is 484 miles, but measured along its windings 948 miles. Pittsburgh its mean level is 530 feet ab ov the tides of the Atlantic Ocean, and at its junction with the Mississippi about 310 feet. Except in high floods the cur-
\zebra\ of the Ohio is gentle and nearly uniform. About 300

miles from its mouth, near the town of Louisville in Ken-
\zebra\, are some rapids, where the river falls 22 feet in less than two miles, but over two miles above that point, on the west side of the river and west of the city of Covington, where the current, not usual in other parts of the river, is all that is perceived in passing down these rapids; but at other times the water is dashed and broken upon the rocky bed of the river, and the current is, in consequence, much more rapid than usual, but not sufficient to throw the vessel over a part of the water passes. To avoid these rapids a canal has been made on the south side of the river, called the Louisville and Port-
land canal. About 15 miles from the mouth of the Ohio a lighthouse bar extends across the river, called the Grand Chain. Above this bar the current is impassable, and the burden of the river is carried by the current in the lowest state of the water. With the excep-
tion of these two places, the Ohio has sufficient water dur-
ing a part of the year to float vessels of 300 tons burden as far as Cincinnati, and boats may ascend it to Pittsburgh, and also both of its upper branches for considerable dis-
\zebra\ above their confluence. The Ohio runs in a valley, enclosed on both sides by ranges of hills, called River Mountains; these hills vary considerably in height, but are generally between 300 and 500 feet; their ascent is some-
times rocky and abrupt, but generally sufficiently gradual to admit cultivation to the summit. The hills diminish in altitude as they approach the rapids of Louisville, where they rise again to a height nearly equal to what they attain on the higher and northern part of the river, until they disappear a little above the confluence of the Ohio and Green rivers. At this point a low country commences, which extends to the mouth of the Ohio, a dis-
tance of more than 150 miles: the river also increases in width and depth after passing the rapids. The banks are thickly wooded, and its soil is a deep alluvium. The low hills which bound the alluvial district are at some dis-
tance from the stream. As the country is higher along the banks of the river than at the base of these hills, the inund-
\zebra\ in which this district is subject have extensive pools of stagnant water, which during the summer send forth noxious exhalations. The whole vale of the Ohio is well wooded.

The rivers which fall into the Ohio from the north, as the Big Beaver, the Muskingum, Sciota, Miami, and Wabash, are navigable in the greatest part of their course. The Muskingum and the Sciota have lately acquired great importance, owing to the Erie and Ohio canal, which runs chiefly along their courses, beginning on the Ohio at Portsmouth and terminating near the mouth of Lake Erie at Cleveland. The largest of those affluents is the Wabash, which has a course of about 500 miles, and is naviga-
\zebra\ for more than 400 miles, though it is obstructed by some rapids above the town of Vincennes. The White river.

which joins the Ohio from the south, especially the Kenhawa, Great Sandy, Kentucky, Green, Cumberland, and Tennesse, are navigable for keel-boats, and many of them for steam-boats, to a great distance from their mouth during the boating season, which generally commences about the 20th of February, and terminates early in June. During the remainder of the year it is only the lower parts of these rivers that are navigable for boats of moderate burden.

South of the mouth of the Ohio no considerable river joins the Mississippi from the east, except the Yazoo, which falls into it five degrees of latitude farther south. Its course may amount to about 250 miles, and it is navigable for boats, in the early part of the season, for about 100 miles.

The rivers which join the Mississippi from the west have a much longer course, as most of them rise on the declivity or near the base of the Rocky Mountains; but as they flow over the great plains having little or no tribulation, in the opinion of persons well acquainted with the country which, it is now (1839) in progress, under the superintendence of the states of Ohio and Indiana, and will probably be com-
\zebra\ in the course of next year; and thus a double water communication will be established between the Ohio and Lake Erie.

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may acquire importance on account of the adjacent country containing many fertile tracts of land. It rises on the northern border of the basin of the Mississippi, in Big Stone lake, which, as already observed, is in the same valley which contains Lake Traverse, the source of the Red river of the nipekog lake, and runs about 300 miles south-east and 200 miles north-east, though its whole course in a straight line does not exceed 275 miles. Its course is exceedingly winding, changing frequently from one to another of these rivers it is intersected by several rocky ledges. During the very floods it is navigable for boats to Big Stone lake, there being but two obstructions that are impassable on such occasions, namely, at Patterson's Fall, nearly 300, and at Great Portage. It is recked up the water of the River of Winter there are portages of moderate length; but during low-water time the upper part of the river is obstructed by shoals and rapids. The vale in which it flows is in the lower parts a mile and a half wide, and enclosed by bluffs about 100 feet high. Along the upper course it is wider, expanding in some places to two or three miles, and the bluffs are lower. The vale presents a mixture of woodlands and prairies; the former however are less frequent along the upper course, and last disappear, with the exception of some small woods 3 or 4 miles from the water. Some parts on the lower course are swampy.

The largest of the affluents of the Mississippi is the Missouri; and as the sources of the Ohio drain the most northern portion of the northern portion of the basin of the Missouri, it is obvious that the bulk of the waters of the Missouri drain its most northern angle. It rises in two branches, in which all the waters descending from the eastern declivity of the Rocky Mountains between 42° and 49° N. lat. unite. The northern, called the Missouri and often called the White river, which rises between 43° and 44° N. lat., but its southern affluents rise as far south as 42° N. lat. Its course is first north-north-east and then east, approaching gradually to the Missouri, which it joins after a course of 800 miles. Though the course of these two branches, according to a rough computation, are about 700 and 600 miles, each one is very nearly not less than 3000 miles. The river then run upwards of 100 miles more; so that at their junction each of them may be compared with the Rhine in length, and probably also in volume of water, as the Yellow Stone river is 500 yards wide near the junction. But though the numerous affluents which the Missouri receives in its upper course bring down a large body of water from the Rocky Mountains (portions of which are covered with snow, if not all the year round, at least for the greatest part of it), the Missouri receives but a small quantity of water through a sandy desert; and though it is joined in the lower part of its course by some large rivers, it is stated, and very probably, that the volume of water which it pours into the Mississippi is not greater than what it contains immediately after its junction with the Yellow Stone. After the junction of its upper branches the Missouri continues its eastern course for 200 miles, declining however a little to the south, until it reaches the Mandan villages (near 100° W. long.), where it is deflected by the Coteau des Prairies to a southern course for above 300 miles, until it unites with White River. In this course of 500 miles it is joined by several affluents from the west; and though some of them flow from 200 to 300 miles, none of them increases the volume of its source, which is chiefly derived from the water through a sandy desert. From its junction with the White River it again flows eastward for 200 miles, and then to the east-south-east for 300 miles, to the mouth of the Kansas river, which is its largest tributary, with the exception of the Platte river. It is navigable for large vessels through the Buffalo Fork; afterwards it turns to the east and south east, traversing the mountains and hills in that direction. Where it issues from that region it is joined by the upper Big Black river, which rises on the northern border of the mountain-region; and in skirting its eastern border, is joined by several rivers, which rise to the west, and bring down a considerable volume of water. From the junction with the Big Black the White River runs south, and joins the Missouri above the confluence of the Platte and Niobrara.

The Missouri river runs parallel with and in a westerly direction to the angle of the basin of the Mississippi, west of Cape Girardeau; but after about 40 miles it enters the bottom of that river, of which the Great Swamp constitutes a great portion, which is traversed by the St. Francis river in all its length. Flowing through a very level country, which is rendered densely covered with timber and forest, but the navigation is entirely obstructed by rafts and fallen trees.

The White River follows next. It rises in the Ozark Mountains, towards the western border of that mountain-region, and runs through the Ozark Mountains to the Buffalo Fork; afterwards it turns to the east and south east, traversing the mountains and hills in that direction. Where it issues from that region it is joined by the Big Black river, which rises on the northern border of the mountain-region; and in skirting its eastern border, is joined by several rivers, which rise to the west, and bring down a considerable volume of water. From the junction with the Big Black the White River runs south, and joins the Missouri below the confluence of the Platte and Niobrara.

The course of the White River exceeds 400 miles, and it is navigable in a moderate state of water for more than 300 miles. The Black River and several of its branches, as the
Strawberry, Current, Eleven-Point, and Spring rivers, are navigable to a considerable extent. The rich bottoms on this river are, with the exception of that on White River, subject to sudden and excessive floods, and consequently less adapted to agriculture than to the rearing of cattle.

The Arkansas joins the Mississippi a little farther south; the Arkansas and its tributaries, the Canadian river, are noticed under Arkansas River.

The last considerable river which falls into the Mississippi from the west is the Red River. Its most remote fork comes from the south-east, and is connected with the Arkansas, which is the largest river of the Rocky Mountains which separates the elevated valley of New Mexico from the extensive plain east of it. This plain is traversed by its eastern course for nearly 500 miles, after which it traverses the mountain-region of the Ozarks, and passes down and continues southwest, and then turns south, in the same direction. The remainder of its course, which is about 300 miles, is south-south-east. Measured along its winding course, the length of the river is probably not less than 1500 miles. About 300 miles from its mouth is a low country, about 40 or 50 miles wide, filled with numerous lakes, and inundated for several months in the year. This tract is called the Rafts of Red River. Up to this point the river is navigable during the greatest part of the year for barges of 400 tons of burden; and continues navigable to the vicinity of Alexandria in Louisiana, where two ledges of rocks extend across the channel about three-quarters of a mile from each other, and occasion rapids, which, however, in high-water, form no obstruction to the passing of boats. At the raft, the river is about 200 feet wide. At this point the river is above the raft rendered impassable for large boats by shoals and sandbars; but keel-boats of ten or fifteen tons may ascend it for some hundred miles above the raft. The upper portion of its valley seems to contain a great extent of water in the winter. In January and February, the river drains the desert; but its bottom is not extensive, and the bluffs along the southern banks sometimes rise to the height of 500 feet. The lower part of its valley is described as a dissected tableland, most of its area being covered with woods, especially the Washita, or Ouachita, which is formed by the numerous streams which descend from the southern and northern declivity of Mount Massarene; it runs in a south-eastern and southern direction, receiving numerous tributaries, especially from the east and bottom of the Mississippi. After its junction with the Texas, it takes the name of Black River, and unites with the Red River about 20 miles from its mouth, after a course of about 400 miles. That part of its course which is designated Black River can ascend only six miles; but it may be navigable for barges. The smaller boats may ascend it for 300 miles nearly all the year round. The upper part of its course lies through a hilly country covered with pine-forests, except the bottoms of the river-courses, which sustain a heavy growth of other trees. The lower part of the river is navigable for boats of 50 tons burden. The further navigation of the Mississippi is much more difficult and intricate, on account of its numerous sandbars and islands, and more dangerous on account of the frequency of sunken trees and rafts. During the high floods (from March to July) there is a sufficient current to move the boats; but during the remainder of the year it can hardly be called navigable, except for boats drawing not more than two or three feet. The average velocity of its current, in a middle state of water, may be estimated between two and five miles a half per hour. The Ohio is usually blocked up with ice during the winter.

The Ohio has a much more gentle current. Its average velocity, in moderate state of the water, may be estimated at two miles and a half, and in a high state, at three miles per hour. The obstructions to its navigation are sandbars, some few sunken trees, and rafts, to which we must add obstructing falls at certain points. The average current velocity is 1 mile in several places. During a middle and high state of water the current disappears, and an accelerated current is the only difficulty to be encountered. There are large masses of floating ice during part of the winter. The season in which the navigation of the Mississippi is generally closed is between the middle of February and the first of March, and continues to the latter end of June. An autumnal freshet usually takes place in October or November, and the river is again navigable for a few weeks. During the remainder of the year only boats drawing three or four feet can be used, and they meet with numerous obstructions in their progress from the lowness of the water.

Navigation and Trade.—The city of New Orleans carries on extensive trade with European countries which skirt the lower course of the Mississippi, and particularly with those on both sides of its great tributary, the Ohio, and its numerous
affluent, and the trade is rapidly increasing. As the goods are exclusively conveyed by water, the number of steam-boats and of flat-bottomed and keel boats which navigate the Lower Mississippi and Ohio is very considerable. According to an estimate, the number of steam-boats employed in this trade in 1834 amounted to 230, measuring more than 39,000 tons, namely:

Total
25, each above 200 tons, passing between Louis- ville and Cincinnati, on the Ohio, and New Orleans, measuring
  8,484
4 between Florence, on the Tennessee, and New Orleans
  1,617
7 between Nashville, on the Cumberland river, and New Orleans
  2,855
4 between New Orleans, on the Mississippi, and New Orleans
  1,002
7 between the places on the banks of the Mississippi where cotton is grown, for the transport of that commodity
  2,116
57, from 120 to 200 tons, in other branches of trade on the Lower Mississippi
  8,641
The remainder, about 126, were of small size, under 120 tons, and employed in various trades
  14,653
39,096

The number of flat-bottomed and keel boats employed in this trade has been estimated at four thousand, with a tonnage amounting to 160,000, so that the whole tonnage employed in this trade is about 200,000.

The Missouri is only navigated by the fur-traders from Mackinaw, on Lake Michigan, to the Missouri river, and some vessels, added to the hostile character of several of the tribes which frequent its banks, render the progress of the common boats very slow, and expose the crews to great dangers in those places where they are obliged to sail near elevated and wooded banks. The Missouri is navigable by canoes for the Indians. At present the American Fur Company established at Mackinaw sends steam-boats up the river as far as the Mandan villages, to collect the furs which the Indians bring down the tributaries of the Missouri in birch-boats.

(Lewis and Clark's Travels to the Source of the Missouri; Pike's Exploratory Travels through the Western Territories of North America; James's Account of Major Long's Expedition from Pittsburg to the Rocky Mountains; Keating's Narrative of Major Long's Expedition to the Sources of St. Peter's River; Darby's View of the United States; Schoolcraft's Narrative of an Expedition through the Upper Mississippi to Itasca Lake; Irving's Astoria.)

MISSISSIPPI, THE STATE OF, one of the states ranging from 30° and 35° N. lat., and between 88° and 91° 40' W. long. Its length from north to south is 333 miles, and its average breadth about 150 miles. The surface is estimated at 80,000 square miles, which is larger than that of England without Wales; but according to some authorities, the area is only about 45,800 square miles. The river Mississippi forms its western boundary from 35° to 31° N. lat., by a course of about 530 miles, dividing it from Arkansas and Louisiana. The parallel of 21° N. lat. separates this state from Louisiana, between the Mississippi and Pearl rivers, for about 105 miles; and the remainder of the boundary-line between these two states is formed by the Pearl river, from 31° N. lat. to its mouth, a distance of more than 200 miles. The Gulf of Mexico washes the southern extremity of the state for about 80 miles. On the east it borders on Alabama, which is separated from it by a line extending nearly 340 miles, and running between 88° and 89° 40' W. long. On the north the parallel of 33° N. lat. divides Mississippi from Tennessee.

Surface and Soil.—The shores near the mouths of the Pascagoula and Pearl rivers are low and sandy, and in many places interrupted by swamps; these tracts are therefore more extensive than the two rivers there is a higher tract of land, beginning two miles east from St. Louis Bay, and stretching to Biloxi Bay, a distance of nearly 24 miles. This tract is healthy, and is resorted to by the inhabitants of Lower Louisiana during the sickly season. The Pearl river rises in the northward part of the state, and flows south to the Gulf of Mexico, and afterwards south-south-east, for about 250 miles. It falls by several branches into the Rigollets, or straits which unite Lake Ponchartrain with Lake Borgne. It is stated to be navigable for boats floating on its surface, but the navigation is shallow, and does not admit vessels which draw more than five feet. The upper branch of the Pascagoula rises, under the name of Chickasawhay, in the prairie
region, between 32° and 33° N. lat., and flows south for about 120 miles, when its waters are increased by those of the Leaf river, a large affluent running down from the north-west. Below this junction the river assumes the name of Pasagoula and continues to flow south-westward for 80 miles, when it falls into the bay of the same name, opposite Cuerno or Horn Island. Near its outlet it is joined by a considerable tributary, the Dog river, which runs parallel to it. The Pasagoula is stated to be navigable for small boats about 120 miles from its mouth, but for other towns, Monticello on the Pearl river, Vicksburg near the Walnut Hills, and Jefferson college at Washington near Natchez, is well endowed: there also ample funds for popular instruction, but hitherto little has been done with them.

Manufactures. Commerce.—The manufactures do not extend beyond the most common mechanical arts. Though this state has a coast-line of about 80 miles, it has no harbour deep enough for schooners; and the adjacent country does not produce one single article for exportation. The trade along the Mississippi, which produces cotton and Indian corn in abundance, sends these articles down to New Orleans, whence it is supplied with those goods of foreign growth or manufactures which are consumed in the country.

Historic and Constitutional.—The first settlements were formed in the neighbourhood of Natchez by some Frenchmen in the beginning of the last century, but they did not thrive. When the country was ceded to the British in 1763, the doors were opened to the first emigrants of the same part, but under the sway of the Spaniards from 1763 to 1800 they again began to decline. In 1800 all that is now comprised in Mississippi and Alabama was formed into a territory by the name of Mississippi Territory. In 1817 the territory was divided into four states, the western was admitted as a member of the Union, and the present constitution was formed. The legislative body consists of a senate and a house of representatives, the members of which are chosen by all the free citizens of the state who are twenty-one years of age. The executive power is vested in the governor, elected, with the lieutenant-governor, every two years by all the free citizens. Mississippi sends two members to the senate and one to the house of representatives at Washington.

(Darvis Veio of the United States; Warden's Account of the United States; Pitkin's Statistical View of the Commerce of the United States.)

MISSISSIPPI COMPANY. [Law. Journ.]

MISSISSIPPI RIVER. [Mississippi, River.]

MISSOURI, one of the states lying adjoining to the North American Confederation, lies on the west of the Mississippi, between 36° and 40° 36' N. lat. and 89° 30' and 94° 30' W. long. Its mean length from south to north is 290 miles, and its breadth from east to west, but along its southern boundary the breadth is estimated at 63,000 square miles, or nearly 50,000 miles more than the area of England, including Wales. The Missouri flows along its eastern boundary for 550 miles, its numerous windings included, and divides it from the states of Illinois, Kentucky, and Tennessee. The southern boundary-line runs along the parallel of 36°, between Missouri and St. Francis, for about forty miles, then along the course of the last-mentioned river northward rather than eastward 450 miles 36° 30', which parallel forms the boundary to 94° 30' W. long., and the western boundary-line, and the parallel of 40° 36' the northern as far east as the river Monees, which for the last twenty miles of its course separates Missouri from the country in possession of the United States.

Surface and Soil.—Beginning with the most southern district, we find that an extensive bottom land extends along the Mississippi, which commences on the north opposite the mouth of the Ohio river, and extends southward to the mouth of the Ohio, and eastward where the two meet, or on the great plains, and is subject in many places to being inundated by the Mississippi. It includes many large swamps, which are rendered almost impenetrable by a dense growth of trees, mostly cypress. The most extensive of these swamps, called the Great Black Swamp, commences in the country of the Illinois Indians, and passes southwards to the mouth of the river on St. Francis, penetrating far into the state of Arkansas. This swamp is
about 150 miles in length, with a width varying from five to twenty or twenty-five miles. The cypress-trees, though of sufficient size, are of little value on account of the difficulty of removing them. Within the bottom are numerous lakes, lagoons, and marshes, but it contains also many isolated tracts of considerable extent, which are elevated above the range of the highest floods. The bottom, although throughout its whole extent a bottomland, is covered with a thick growth of timber and bushes. As it is well adapted for the growth of grain, cotton, and tobacco, several settlements have been formed on it.

The high grounds along the Mississippi begin twelve miles below Cape Girardeau, and extend to the mouth of the Missouri river. The highest part lies between St. Genevieve and the mouth of the river Maramec, where the banks of the Missouri, composed of solid masses of limestone, rise in some places 360 feet above the water. This undulating country extends westward to the river Gasconade, occupying the basin of the Merrimack or Maramec river as far south as the lead-mining district. It is diversified with prairies and forests, the lower lands being well wooded, but the high grounds are intersected here and there by prairie meadows. This is the most populous section of the state.

Between the rivers Gasconade and Osage, both of which are affluent of the Missouri river, a range of low hills appropriately termed the mountains as flowing from the level of its water. They are thinly wooded, and constitute the most northern extent of the Ozark mountains, a region of which the undulating country between Cape Girardeau and the river Gasconade may be considered as a continuation of the former, on which the number of settlements is increasing. The range extends from this point in a south-western direction to the southern extremity of the state of Arkansas, where it terminates on the banks of the Red River. The length of this mountain tract may be 450 miles, and its average breadth about 1 mile. On the north side of this river rises a broad face of that portion of Missouri which is south of the Missouri river, bordering on the east on the wide bottom of the Mississippi, and on the west on the undulating country through which the Osage river flows. The surface of this tract is extremely hilly, broken, and mountainous; the hills and mountains rise from 500 to 1000 feet above their base, though not so high as in Arkansas, where they attain the height of 1200 feet and more. The hills are exceedingly numerous, and most of the five Missouri rivers flow into a multiplicity of knobs and peaks with rounded summits, and presenting perpendicular cliffs and abrupt precipices of sandstone. They are covered with a poor soil, which is generally shallow, and overgrown almost exclusively with grass. The population is sparse, and the numerous rivers which originate in this mountain tract are bottoms of moderate extent, which, with some valley land, are the only parts of it which have a rich soil, and would repay cultivation. Few settlements however have been formed on them, because they are subject to excessive floods occasionally brought down by the rivers from the hills and mountains. These floods come so suddenly, that on some occasions the water has risen, in the course of one night, more than twenty feet. The country west of this mountain-region, especially the basin of the Osage river, resembles that which is east of the river Gasconade, its surface being undulating and diversified with woodlands and prairies. But the prairies cover a much greater portion of the country on the bottom than on the higher ground, and in a moderate extent, produce nothing but stunted timber. The dry prairies occupy at least nineteen-twentis of the surface.

This region however does not extend to the banks of the Missouri, being separated from it by a rich alluvial soil, which is well watered by many streams. The prairies extend from the river to that of the Mine river, with a width of four or five miles, and is usually denominated the Boon's Lick country. This bottom contains a considerable number of settlements, and it is said that a part of the prairies extend to the Mississipii. On the northern banks of the Mine river, from St. Louis to DeSoto, there are two tracts of timber; but these are not occupied by other parts of Missouri, with the exception of the country near the confluence of the Missouri and Mississippi; but the greater part is still in a natural state, and covered with a deep and heavy growth of timber.

In the country of the Missouri, which comprehends about one-third of the state, the fertile tracts are nearly exclusively confined to the bottoms along the Missouri and Mississippi. Those of the last-mentioned river, though equally extensive, are not so fertile as those of the Missouri, which appears from their descriptive account to the extent of their fertile portion, to their prairie and bottomland, the quarter of the whole region is occupied by the prairie and bottomland, which are united with the valley of the Mississippi by the valley of the Osage river. The wooded prairies occupy at least ninety-twentieths of the whole region, and comprehend some of the best land in the state, which however cannot be cultivated at present, as they supply neither wood nor stone for making fences.

Rivers.—The Missouri washes the eastern boundary for 550 miles, and the Missouri traverses the state from west to east, with a winding course of about 400 miles. [Missouri River.] Some of its affluents require notice, its White River and Franklin are briefly noticed. The river Maramec, which enters the Missouri about 40 miles below the mouth of the Missouri, is only a small river, its course not exceeding 100 miles; but it is important as affording a considerable number of navigable channels to a fertile and improving tract of country, the Salt River; which joins the Missouri about 60 miles above the mouth of the Missouri, runs more than 200 miles with a gentle course, and through a tolerably fertile bottom, and the number of settlements is increasing on the rivers which join the Missouri, the Gasconade and Osage are the principal. The Gasconade is rather small, and runs about 120 miles, but derives some importance from its position, though the number of settlements on its banks is small. The Osage reaches the Arkansas and Kansas rivers, and flows in a general direction east-north-east about 300 miles, joining the Missouri very near the centre of the state. On its northern bank is a tolerably wide bottom with an alluvial soil of considerable fertility, where several settlements have been made. It is navigable through the greatest part of its course.

Climate.—The climate of Missouri is cold and extremely variable. The winters are severe and long. Three years can be counted in which the thermometer was below zero, and St. Louis, and sometimes it is frozen for two months and more. The summers are often hot, but subject to sudden and frequent changes of temperature. This circumstance is mainly attributed to the north-western winds, whose prevailing blast is from the north-east and west. They pass the Alleghany mountains, and east of them, in this state they are felt in all their force. Though they are dry and bracing, they produce sudden and unpleasant changes in the temperature of the atmosphere. The mean annual temperature of St. Louis is estimated at 56°, or about 6° more than that of London, but it has probably been overrated.

Productions.—Wheat and Indian corn are the staples of this state; but in the south-east section cotton is produced. Agriculture is still in its infancy, as may be expected in a country which has been so lately settled. It seems that most of the vegetables and fruits of England would grow if they were attended to. Tobacco, hemp, and flax are cultivated for the Missouri market. Cattle abound where the bottoms and prairies are near one another. In the summer they feed on the grass of the prairies, and in winter on the cane and rushes of the alluvial soil. Horses and hogs are numerous. Beavers are met with on large herds early in the year, all the prairies east of the Ozark mountains, are also elk and deer. The animals, which are killed for their skins only, are beavers, otters, bears, foxes, cats, racoons, martens, and lynxes. The fur trade however has somewhat declined.

The mineral wealth chiefly consists of lead, coal, iron, and salt. The principal lead region is in Washington county, on both sides of Big River, an affluent of the Maramec river, and extends about 100 miles in length by 40 in width; but this mineral occurs in detached masses in other places
also, between White River and the Missouri. In some years these mines have produced more than one million of pounds. Coal is found in several places, but it is not worked, though it must soon become of importance in a country which is so cold and so generally destitute of wood. Iron-ore in abundance occurs in the hills.

Inhabitants—There are still some aboriginal tribes within this area, Shawnees and Shawanees, or Shawness, with some Creeks, Chocottaws, and Chickasaws, have emigrated from the countries east of the Mississippi, and retired into the country extending between the White and St. Francis rivers, where they live in large and commodiously built huts. They are much barbarous, and have no horses and cattle, but have not abandoned hunting. Along the western border of the state are the Osages, who have their permanent dwellings in villages beyond the boundary-line, and the hunters and traders of the Osage river; but hunting-grounds extend within the territories of Missouri. They also cultivate maize, pumpkins, beans, water-melons, and squash. The number of individuals composing these tribes is stated to exceed five thousand. The remaining population consists of whites and blacks. In 1830 their number amounted to 66,586, of which 55,988 were whites, 376 free persons of colour, and 10,222 slaves. In 1830 the number had increased to 140,190, of which 115,200 were free people and 24,990 slaves.

St. Louis and Territory—Missouri is divided into 34 counties; but some extensive tracts, especially in the south-western and north-western sections, are not yet laid out in counties. The seat of the government is Jefferson, near St. Louis, a place situated on the Missouri, about twenty miles above the mouth of the Osage river. The most considerable place is St. Louis, which stands on the gently sloping banks of the Mississippi, about twenty miles below the mouth of the Missouri. The buildings spread from the margin of the river to the brow of the land, beyond which the country extends in a level and mostly open prairie. In 1816 the population amounted only to 2000, but it is now much increased. The whole commerce of the country is concentrated in this place, which is a depot for all European and foreign merchandise for the consumption of the country bordering on the Upper Mississippi, Missouri, and Illinois rivers. The channels by which St. Louis is supplied with them are the Lower Mississippi and the Ohio river. Four steam-boats were employed in its trade in 1834, measuring more than 1000 tons. St. Genevieve, with 2000 inhabitants on the Mississippi, is the principal depot of the produce of the mines, which is brought down by the Missouri. In the mining district is Potosi, a small but thriving place. New Madrid is the most important place, in the Lower Mississippi, of which the name is grown, stands also on the Mississippi; it was visited by a dreadful earthquake in 1811. St. Charles, on the Missouri, about 20 miles from its mouth, has 1200 inhabitants, and some commerce with the country about the town. Franklin, on the upper Missouri, has about 1600 inhabitants, and 1500 inhabitants, and is the starting place for the cars of which visits St. Fè, in New Mexico, and goes even to Chihuahua.

There is a Roman Catholic college at St. Louis, conducted by the Jesuits, and another Roman Catholic seminary at Bois-Brulé Bottom. The principal sects are Roman Catholics, Methodists, Baptists, and Presbyterians.

Manufactures and Commerce.—Most manufactured articles are imported from the states east of the Mississippi. Commerce is limited to the export of Indian corn and live stock, with cotton in a moderate quantity, and lead. Besides its own live stock, many horses and mules which are imported from Mexico are sent to the trade on the other side. Furs still form a considerable article. The importation consists of manufactured goods, with some colonial goods and wine.

History and Constitution.—A part of this country for many centuries had been visited by the French from Canada, no settlement was formed before 1763. In this year St. Genevieve was founded, and in 1764 St. Louis. But these and a few other places remained in a backward state until 1803, when the United States got possession of the country. The Mississippi Territory was then established, and the following year the state now called Louisiana was separated from it, and Missouri became a separate territory. In 1821 it was admitted as a member of the Union, and formed its constitution. Slavery is allowed in this state. The legislative body is composed of two assemblies, a senate and a house of representatives. The members of both are chosen by all the free citizens who have completed their twenty-first year. The executive power is vested in a governor, elected, with the lieutenent-governor, every four years by all the free citizens. The judges are appointed by the governor, with the advice and consent of the senate; they hold office during good behaviour, but not beyond the term of 25 years. Missouri sends two senators and one representative to Congress, and one to the house of representatives at Washington.

(Darby’s View of the United States: Warden’s Account of the First Year’s Explorations; James G. Wilkinson’s Expedition to the Rocky Mountains, performed by Major Lewis and Captain Clarke to the Source of the Missouri; Pitkin’s Statistical View of the Commerce of the United States of America.)

MIST. The vapour of water, when mixed with air of the same or a higher temperature, is invisible; but when the temperature of the air is reduced below that of the vapour, the vapour becomes visible, and forms a mist. Water, in the state of vapour, is rising into the atmosphere at all the usual temperatures. At and even below the freezing-point water evaporates, and ice and snow, in a dry atmosphere, gradually disappear without becoming liquid. But as heat is the sole cause of the conversion of water into water-vapour, the quantity remaining the same, is in proportion to the temperature; so that in very hot weather the air is not easily saturated with vapour, and in cold weather evaporation is slow: thus in very cold weather the condensation of the vapour is slow and weak, and in hot countries than in temperate climates, in all cases where similar surfaces of water are exposed to the sun’s rays. Indeed, it has been found that the quantity of vapour in the air diminishes nearly uniformly with the temperature of the air, at least up to the limit of the condensation; but as the quantity of vapour which the air will hold at any given temperature is limited, whenever that quantity is near or at the point of saturation, a very small reduction of temperature renders the air misty, and a further reduction converts it into snow or ice.

As every reduction of the temperature of the air has a tendency to destroy the transparency of the vapour which contains it, the atmosphere in our variable climate is seldom very clear. Soon after sunrise however, in fair weather, the vapour near the earth having been precipitated by the night-cold into the form of dew, and the sloping rays of the sun having little power to raise more vapour, the air is almost perfectly transparent, and every object has a clearness and distinctness of outline which it never has at any other time of the day.

When the mist is very thick, it is called a fog. The fog which frequently occurs in London in the winter arises from the large quantity of vapour produced by a great city being condensed in the air, from the cold temperature. It is not a quantity of vapour which the air will hold at any given temperature, but it is the quantity of vapour which the air will hold at any given temperature but a sufficient quantity of it is condensed by the cold air.
several well-ordered schools and charitable institutions.

The town, which lies in a flat marshy spot near the Aa, has not an inviting appearance, though it is not closely built; it contains large gardens within the walls, and has some broad, straight, regularly built streets, only a few of which however are paved. Out of the town is the fine palace (which was never completed), the former residence of the dukes of Courland, but now converted into barracks. The manufacture of some soap. Mucha was for several years (prior to the treaty of Tilsit, 1807) the residence of Louis XVIII, king of France, during his exile.

MITHRIDATES, or MITHRIDA'TES, a common name among the Medes and Persians, which appears to have been formed from the Persian word for the sun, and the root da, signifying 'to give,' which occurs in most of the Indo-Germanic languages. The name however was written in several ways. In Herodotus (i. 110) we find Maršāpērān in Xenophon (Anab., vii. 8, § 25), Mardhāpērān in the Septuagint (Iērā, i. 6, iv. 7), Mardhāpērān in the Greek Strabo, in the Hellen the Hebrew 'םלעגנ; and in Tacitus (Ann., xii. 10), Meherdētes. On the Greeks coins it is written Mithridates.

A large class of names in different dialects of the Indo-Scythian languages have the same termination as Mithridates. Thus in Sanskrit we find the names Devadatta, Dvāpatra, Indravatī, Indravatā, Vasavadatta, Vasavadāta, that is, 'given by the gods,' by Hā, by Indra, by soma, or the moon; and in Greek, such names as Theodotus, Diodotus, Zenodotus, and Herodotus. In Persian names the same termination occurs; as in the Hormidae of Agathias, the Pharnaces and Parthyes of Herodotus (vi. 77, ix. 76), and the Madates of Curtius (v. 3),

Mitra, or Mithra, is said by some writers to have been one of the most powerful good spirits created by Ormuz. The mysteries of Mitra were celebrated with much pomp and ceremony at the time of the Persian religious festival of the Sasanians; but we do not read of the worship of the sun under this name in the earlier Greek writers. (Hyde, Hist. rel. vet. Pers., e. 4, p. 109.) The word is evidently the same as mītra, one of the names for the sun in Sanskrit. This word also appears in many other ancient Persian names, as Mirpadova (Herod. iii. 120), Mitrapada (Himilco, i. 102), Mitraya (vii. 67), Sopara (vii. 68), &c.; and in Mithra, Mitrayīna, or Mitrayīnā (Xenoph., Hellen., i. 6; Ariarn, Anab., i. 17, iii. 16), which appear to be derivatives. (Poll's Etymologische Forschungen, i. p. xviii., &c.; Rosen, in Journal of Education, iv. p. 334, 335.)

The most celebrated race of princes of the name of Mitridates were the kings of Pontus, who were descended from the son of Pharnaces, and who overthrew the Magi, B.C. 521. (Florus, iii. 5; Diod. xix. 43.) Polib., v. 43.) The following is a list of these kings:

Mithridates I, of whom little is known. (Aristot., De R., v. 10.)

MITHRIDATES II. succeeded Ariobarzanes II., B.C. 363. He took an active part in the various wars which were carried on by the successors of Alexander the Great; and being both an active and enterprising prince, he greatly extended his paternal dominions, whence he is frequently surmamed the founder (sērēn) of the kingdom of Pontus. He also ruled over Cappadocia and Phrygia. He was put to death by Antigonus, B.C. 302, at Cius, in Mysia, at the age of eighty-four, according to Lucian (Macrob. c. 13), because he was suspected of favouring the interests of Cassander.

MITHRIDATES III., son of the preceding, ruled from B.C. 302 to 266.

MITHRIDATES IV., B.C. 240-190; the son of Ariobarzanes III., was left a widower by his father, and attacked Sinope, which was taken by his successor Pharnaces, and carried on war against Eumenes II. He was in close alliance with the Rhodians, and joined with some other princes of Asia Minor in making valuable presents to that people, to repel the Athenians, who formed a confederacy against the Romans. (Polyb. v. 43.) He married the sister of Seleucus Callinicus, by which alliance he obtained Phrygia, his own daughter was married to Antochus the Great.

MITHRIDATES V. was probably a son of the above, and reigned from B.C. 190 to 184. He had an ally in the Romans, and assisted them in the third Punic war with a considerable fleet. He was assassinated at Sinope, and was succeeded by his son.

P. C., No. 948.
victories of Fimbria, and the state of parties at Rome, made Sulla anxious for peace, which was at length agreed upon (n.c. 84) on condition that Mithridates should abandon all his conquests in Asia, and restore Bithynia to Niomedes, and Cappadocia to Ariobarzanes.

But this war was scarcely finished before Mithridates was again involved in hostilities with the Romans. Mithridates had collected a large army to carry on war against the Colchi. Murena, who commanded in Asia, perceiving or pretending to perceive a disposition in Mithridates to renew the war, seized the opportunity of enriching himself, and, without any authority from the senate or Sulla, invaded the dominions of Mithridates, i.e. those he had collected much plunder. Mithridates, having in vain complained to the senate, collected an army to defend his dominions, and completely defeated Murena on the banks of the Halys. But as Sulla was displeased with Murena for having attacked Mithridates, the peace was renewed, and thus an open rupture was avoided for the present.

During the next eight years Mithridates employed himself in making preparations for a renewal of the war; and in n.c. 74 he broke the treaty which existed between him and the Romans by the invasion of Bithynia. Lucullus was appointed to the command, n.c. 74, and commenced the campaign by besieging Cyzicus, a city on the Propontis, which had been supplied by Mithridates with every description of military stores. In the following year Mithridates marched upon the town, but was defeated by Lucullus, and obliged to retire to Pontus. He was soon after followed by Lucullus, and having lost another battle at Cabiria, on the borders of Pontus and Bithynia, he fled into Armenia to seek the protection of the king. Mithridates, who had been appointed king of the wild tribes on the eastern shores of the Euxine, refused to assist his father, and provided for his own safety by making peace with Lucullus.

In n.c. 69, Tigranes was completely defeated by Lucullus, during the absence of Mithridates, near his capital Tigranocerta, which was soon after taken by the conqueror. In the following year Tigranes was again defeated, together with Mithridates, near Artaxaia; but Lucullus was not able to follow up the advantages he had obtained from his victories, in consequence of the mutinous disposition of his troops. [Lucullus.] Mithridates was thus enabled to collect another army without opposition; and having returned to Pontus, he defeated the Roman general Triarius, with the loss of 7000 men before Lucullus could march up to his assistance. The victory was followed by others; various parts of Asia Minor again submitted to his authority; and the Romans appeared to be on the point of losing all the acquisitions they had made during the war. But the power of Mithridates had been shaken to its foundation, and on the appointment of Pompey to the command, n.c. 66, the war was soon brought to an end. Mithridates was defeated on the banks of the Euphrates; and in consequence of Tigranes having submitted to Pompey, he fled to the barbarous tribes dwelling to the north of Caucasus, who received him with hospitality and promised him support. The spirit of Mithridates had not yet been broken by adversity; and he, purposed, with the assistance of the Colchi and Scythians, to carry into execution a plan which he is said to have formed in his earlier years, namely, of marching through Thrace and Macedonia, and invading Italy from the north. But these plans were frustrated by the plots of his eldest son Pharnaces, who, gained over the army to his side, and deprived his father of the crown. Utterly falling to the hands of the Romans, Mithridates put an end to his own life, n.c. 63, at the age of 68 or 69, after a reign of fifty-seven years.

(Appian's Mithridatic War; Strabo; Livy's Epitomes; Plutarch's Lives of Sulla and Lucullus; Justin; Velius Lupus, De Heptaplomania; Clinton's Fasti Hel lenika, vol. iii., Appendix, 2; Kings of Pontus.)

MITHRAS. [Mithraeis.] MITHRAX. [Mithraeis, xiv., p. 299.]

MITRA. (Zoology.) [VOLTA.] MITRE. [Mitra, M. F. V.]

MITRE (from mitra, mitre, a head-band or diadem), the crown or pontifical ornamental worn on the head by archbishops and bishops, and in some instances by abbots, upon solemn occasions. The original meaning of Mitra, as it appears from an inscription of Nerva, was adopted to protect the lower part of the body. It is used by later writers to signify a band for the head, worn by the Greek females; and more particularly to indicate the head-dress worn by Lydians, Phrygians, and other nations of Asia Minor, which is sometimes called the Phrygian cap or bonnet. It is not known when it was first adopted by the hierarchy. Gough, in his 'Sepulchral Monuments,' vol. i., p. 315, says, 'The mitres of Christian prelates were borrowed from the Apex or Tutilus of the Flamen Dia.' The pope has four mitres, which are more or less rich according to the solemnity of the feast-days upon which they are to be worn. The cardinals antiently wore mitres, before the hat, which was first granted to them by the council of Lyon in 1245. Furetiere, in his 'Dictionnaire Universelle,' says that it was not permitted to cardinals to wear a mitre that abbeys were allowed to wear mitres. The Premonstratensians procured a constitution, which was confirmed by Pope Innocent III., that all the abbots of their order should wear them.

The term mitre was at first only used by bishops as early as the time of the Saxons, and continued as long as the Roman Catholic religion was that of the state. Since that time the mitre has appeared only as an heraldic ensign, surmounting the episcopal coat of arms, unless perhaps as an occasional instance, such as Evelyn refers to in his 'Diary.' He says: 29th Dec. 1661. The bishop of Gloucester preached at the abbey at the funeral of the bishop of Hereford, brother to the duke of Albemarle. It was a decent solemnity. There was a silver mitre with episcopal blessing blessed by the bishop before he died, which was followed by the duke his brother, and all the bishops, with divers noblemen. (Evelyn's 'Diaries, vol. i, p. 343.) Antiently, the mitre, as an ornament, seems to have descended from bishop to bishop. Among the Cottonian manuscripts four mitres, dated 2nd of July, 4th of Dec. and 20th of Sept. of 6. vii. c., an Archbishop Chicheley the mitre which had been worn by his predecessor. That it was an ornament of great expense may be gathered from the circumstance that Archbishop Pecham's new mitre, in 1288, cost 175s. 4s. 1d. (See Dugdale's 'Excerpta from the Lambeth Registers; MS. Brit. Mus.')

As an heraldic ornament the mitre of a bishop is only surrounded by a fillet set with precious stones. The archbishop's mitre is surmounted by a ducal coronet.

MITRELLA. [VOLTA.] MITREOLA. [VOLTA.]

MITTIMUS, a legal term applied to certain writs and warrants in which the word mittimus, 'We (the king) send,' is expressed or implied.

If a record of one court be, for any purpose, required to be transmitted to another, as one court may exercise no direct authority over another, the course is, for a writ to issue out of Chancery, in the king's name, requiring the person to whom it is addressed to attend and show cause why he should not be proceeding in Chancery; and when the record is removed into the Court of Chancery by this writ (of certiorari), it is sent from the Chancery to the court in which it is wanted by writ atминистum.

The term is more in frequent use as applied to the warrant by which magistrates commit and send persons charged before them with offences to the proper custody, in order that they may be forthcoming to answer the charge. When the name of the person is inserted in the warrant, it is termed a 'certiorari.'

As to what persons may be committed, the place to which they may be committed is, by the warrant, [See Burn's 'Justice,' title 'Criminal Law Commissions.']

MITU, a name for some of the Cursaw birds. [Cath. civ., vol. viii., p. 129.]
Miltyone. [Lesbos.]

MIXTURES, in Pharmacy, signify liquid medicines consisting of several ingredients, either in a state of mechanical suspension in some viscous medium, or in a state of complete solution. In preparing these, care must be taken not to mix in the same Jordan any substances which exercise an antagonistic action on the body, or which are incompatible, from one ingredient decomposing another. Sometimes however it is the substance resulting from the decomposition of one or more of the constituent articles which is the local effect, (Notin 13, 26; xxii, 12.) in this case the decomposition of the materials is indispensable.

No greater quantity of a mixture should be prepared at one time than is likely to be used before the compound is spoiled, either by the atmosphere, if the materials are of a vegetable kind, or by the action of the various ingredients on each other.

MNR'MIA. [Ciliograda, vol. vii, p. 162.]

MNE'MONICOS. [Memory.]

MOAB (MOAB). A nation descended from Moab, the son of Lot by his elder daughter (Gen., xix, 37), and consequently related to the Ammonites, with whom we find them closely connected in their subsequent history. (Am'mo'tites.) The earliest accounts represent them as dwelling in the central part of the kingdom of the Arabs, and as being reduced by the river Jordan, on both banks of the river Arnon (Wady Modjib), from which they had driven out the Emim, who were said to be a tribe of giants. (Deut., ii, 11; Gen., xix, 5.) The plains near the mouths of the rivers Wady El-Moab, and Wady El-Ammar, are known to them as the Plains of Moab. (Num., xxii, 1; Josh., xiii, 23; Deut., xxxiv, 1, 8.) Before the invasion of Canaan by the Israelites they had been dispossessed by the Amorites of the country north of the Arnon, which was thenceforth their dominion. (Num., xiii, 2; Josh., xiii, 18.) (Am'mo'tites.) At the division of Canaan among the tribes of Israel, this tract of country was given to Reuben and Gad.

By the command of the God, the Israelites left Moab in order to possess their country. (Deut., ii, 10; Judges, xii, 15, 18; 2 Chron., xx, 10.) But while the Israelites, after conquering the Amorites, were encamped in the plains of Moab, Balak, the king of Moab, sent for the prophet Balaam to curse them. (Num., xxii-xiv.) Balaam found himself compelled by the goel of God to bless the Israelites instead of cursing them. Saul warred against Moab (1 Sam., xiv, 47), and David made them tributary to Israel. (2 Sam., xii, 4.) The tribute which they paid consisted of sheep and lambs. (2 Kings, iii, 4.) After the partition of the kingdom, we find Moab subject to the king of Edom, and rebelled after the death of Ahab, in A.D. 897. (2 Kings, i, 1; iii, 5; and Je, xi, 1.) Jehoram, the son of Ahaz, assisted by Jehoshaphat, king of Judah, defeated them in a great battle, but failed to subdue them. (3 Kings, iii, 6-37.) Soon after this, Moab, with the Ammonites and other nations, invaded Judah, but the invaders quarrelled among themselves and destroyed each other. (2 Chron., xx.) In the reign of Josiah, about B.C. 638, the Moabites again made incursions upon Israel. (2 Kings, xiii, 20.) It is probable that after the tribes of Reuben and Gad had been carried captive by the Ishmaelites (about B.C. 740), the Moabites recovered the country they had formerly possessed north of the Arnon, for Isaiah (xxv., xxvi.) speaks of towns of the Moabites in that district; but from the same prophecy it would appear that they were again driven back beyond the Arnon. In common with the other nations on the borders of Palestine, the Moabites were subdued by Nebuchadnezzar, under whom they made war upon Judah. (2 Kings, xxiv, 25.) From Jeremias, xxxvi, 20. it appears that near the beginning of the reign of Zedekiah, the Moabites, together with the other nations endeavoured to persuade him to revolt from Nebuchadnezzar, but without immediate success, as the rebellion of Zedekiah did not take place till about the ninth year of his reign. (2 Kings, xxv, 7.) From the capture of Jerusalem, the Moabites and Ammonites were reduced to subject nations. Nebuchadnezzar in the fifth year after the destruction of Jerusalem. (Antiq., x, 5, 7.) This may have been the event referred to in the prophecies of Ezekiel (xxv, 8-11) and Zephaniah (ii, 11-15). The Moabites are incidentally mentioned in several other passages of the Old Testament and by Josephus. The prophecies contain many threatenings against them. Their name ultimately disappeared in that of the Arameans.

The Moabites were a pastoral people. (2 Kings, iii, 4.) Their country was well adapted for rearing cattle, and also produced corn and wine. (Ruth, i, 1; xvi, 8-10.) It contained many mountains and fertile valleys, and was well watered by the Zered, which rises in the mountains, and falls into the Dead Sea. It is called by Josephus Moabitis. (Bell. Jud., iii, 3. 3; iv, 8. 2,) and corresponds to part of the present district of Kerek. Several cities of Moab are mentioned in the Old Testament. (Je, xv, xvi, &c.) The capital was Aser, in the Moabite land. (Deut., ii, 9.) Afterwards called Areoplos. Its ruins, which still retain the name of Rabbah, lie about 25 miles south of the Arnon, near a stream which is now called Beni-Hamed. Jerom states that the Moabites were destroyed by an earthquake in their youth. The country of Moab was well watered, and was inhabited by the Moabites until they were expelled by the Ammonites. (Num., xxiv, 14.) The entire country was in the past a kingdom of Baal-peor and Chemosh. (Num., xxiv, 14-19; 2 Kings, xiii, 11.) In cases of extreme danger, they offered human sacrifices (2 Kings, iii, 27.)

(Reid's Palestine; Calmet's Dictionary; Winet's Biblical Heilswörterbuch; Burchard's Travels in Syria.)

MOALLAKAT. [Arabia, p. 219.]

MOBILE, [Alaska.

MOCARANGUA, or MONAMATAPA. [Sopalla.]

MOCHA. [Arabia.]

MOCING BIRD, the vulgar name for that singular songster the Mimus Pudiculus of Latham, Turdis polyglottos of Linneaus and Barnard, and Orchene polyglottos of Swainson, and Mimus polyglottos of Boie.

Generic Character. [Merulid., ante, p. 122.]

Description.—Male. Upper parts of the head, neck, and back, dark brownish ash; and, when new-moulded, a fine buffy grey; wings and tail, of the same colour, but brighter than in those that have been domesticated; iris of the eye yellowish white, then black; bill black, the base of the lower mandible white; legs and feet black and strong.

Female very much resembling the male, but the white is less, spreading over only seven or eight of the primaries, does not descend so far, and extends considerably farther down on the broad than on the narrow side of the feathers. The black is also more of a brownish cast. (Wilson.)

Young birds very similar in plumage, but of a much more uniform coloration, and smaller in size.

Habits, Reproduction, &c.—The extraordinary vocal powers of this wonderful song-bird and his lively habits, as recorded by eye and ear witnesses, are so uncommon that we should think we were reading of some magician,
bird in a fairy tale, did we not know the fidelity and accuracy of the excellent observers who describe it. Wilson thus portrays this polygamy:

"The ease, elegance, and rapidity of his movements, the animation of his eye and the intelligence he displays in listening and laying up lessons from almost every species of the feathered creation within his hearing, are really surprising, and mark the peculiarity of his genius. To these qualities we may add that of a voice, full, strong, musical, and rich in tones. He has always, every morning, the most melodic tones of the wood-thrush, to the savage scream of the bald eagle. In measure and accent he faithfully follows his originals. In force and sweetness of expression he greatly improves upon them. In his native groves, his song is a tall bugle. The dawn of dewy morning, while the woods are already vocal with a multitude of warblers, his admirable song rises pre-eminent over every competitor. The ear can listen to his music alone, to which the other birds add a mere accompaniment. Neither is this song altogether imitative. His own native notes, which are easily distinguishable by such as are well acquainted with those of our various song-birds, are bold and full, and varied seeming in a tall bugle. They consist of short expressions of two, three, or at most five or six syllables, generally interspersed with imitations, and all of them uttered with great emphasis and rapidity, and continued with undiminished ardour for half an hour or an hour at a time. His ear rolls all in his tail, which gives the buoyant gait of his action, arrest the eye, as his song most irresistibly does the ear. He sweeps round with enthusiastic ecstasy; he mounts and descends as his song swells and dies away; and, as my friend Mr. Bartram has remarked, "he always appears to fly with the velocity of an arrow, as if to recover or recollect his very soul, expired in the last elevated strain." While thus exerting himself, a bystander, destitute of sight, would suppose that the whole feathered tribes had assembled together on a trial of skill, each striving to outface the other, by the most effective and striking manner of his imitations. He has many times deceives the sportsman, and sends him in search of birds that perhaps are not within miles of him, but whose notes he exactly imitates; and his manner is frequent occasion of plentiful planting on the admirable mimic, and are decoyed by the fancied calls of their mates, or dive into precipitation with the depths of thickets at the scream of what they suppose to be the sparrow-hawk.

The song-bird loses little of the power and energy of his song by confinement. In his domesticated state, when he commences his career of song, it is impossible to stand by uninterested. He whistles for the dog; Caesar starts up, wags his tail, and runs to meet his master. He sometimes, on a sudden, lances at a bug, or a fly; he will hang with hanging wings and bristled feathers, clucking to protect its injured brood. The barking of the dog, the meowing of the cat, the cracking of a passing wheelbarrow, follow with great truth and rapidity. He repeats the tune taught him by his master, though of considerable length, fully and faithfully. He runs over the quiverings of the canary and the clear whistlings of the Virginia nightingale, or red-bird, with such superior execution and effect, that the most admired songfeather of their own inferiority, and become altogether silent, while he endeavors to triumph in their defeat by redoubling his exertions. This excessive fondness for variety however, in the opinion of some, injures his song. His elevated imitations of the brown thrush are frequently incorrect. He imitates the notes of singing thrushes, the water-thrush, the blue-bird, which he exquisitely manages, are mingled with the screaming of swallows or the cackling of hens: amidst the simple melody of the robin we are suddenly surprised by the shrill restitutions of the whip-poor-will, which with so much simplicity and grace he attracts to itself and twenty others succeed, with such imposing reality, that we look round for the originals, and discern with astonishment that the solo performer in this singular concerto is the admirable bird now before us. During this exhibition of his powers, he spreads his wings, expands his tail, and throws himself around the cage in all the exuberance of enthusiasm, seeming not only to sing, but to dance, keeping time to the measure of his own music. Both in his native and cultivated state, we have been of opinion that, as soon as the moon rises in silent majesty, he begins his delightful solo; and serenades us the live-long night with a full display of his vocal powers, making the whole neighbourhood ring with his inimitable melody."

Audubon is of opinion that in song it is far beyond the nightingale. He pronounces the notes of that bird to be equal to those of a souzette of taste, who, could she study under a Mozart, might perhaps, in time, become very interesting in her way. But he thinks it quite absurd to compare her essays to the finished talent of the Mocking Bird. In confinement its melody, though very beautiful, is far less so than the free wildness of the wood-notes wild. He describes its imitative powers as amazing, and says that these birds mimic with ease all their brethren of the forests or of the waters, as well as many quadrupeds; but though he has heard that the bird possesses the power of imitating human voice, he never met with an instance of that mimicry.

The last-mentioned author gives us a most interesting detail of the loves of these charming birds amid the rich scenery of the fertile Great Lake District. Beautiful flowers, Bigmionias, the white-flowered Satureia, and the golden orange, are intertwined with innumerable vines. "For awhile," continues this graphic describer, "each long day and pleasant night are thus spent; but at a peculiar note of the female he ceases his blandishments, and bade wishes. A nest is to be prepared, and the choice of a place in which to lay it is to become a matter of mutual consideration. The orange, the fig, the pear-tree of the gardens, are inspected; the thick bristly patches are also visited. They are never seen globular, but with the pointed form of a cone; so well does the bird know that man is not his most dangerous enemy, that instead of retiring from him, they at length fix their abode in his vicinity, perhaps in the nearest tree to his window. Dried twigs, leaves, grasses, cotton, and all sorts of straws, they line with, and the male, with the branch, and there arranged. The female has laid an egg, and the male redoubles his caresses. Five eggs are deposited in due time, when the male, having little more to do than to sing his mate to repose, attunes his pipe anew. Every morning and evening he soars high, the "song of dear" taste of which he is sure will please his beloved one. He drops upon it, takes it in his bill, beats it against the earth, and flies to the nest to feed and receive the warm thanks of his devoted partner. The eggs are pale green, blotched and spotted nearly all over with umber brown. The female sits fourteen days.

The enemies of the Mocking Bird are cats, the Fides Sulci, and snakes, especially the earth snake, which Wilson describes as the mortal enemy of our songster's eggs and young, and as the object of his especial and deadly vengeance; for the bird rarely leaves his for, when he has found him, alive. "Children," says Audubon, "seldom see the nest of the Mocking Bird, for, to secure it, the hen diversifies the place she chooses; she works hard at it and arranges it with care, and so well does this feeling prevail throughout Louisiana, that they will not willingly permit a Mocking Bird to be shot at any time."

The food of this species consists, according to Wilson, of the berries of the holly, holly, and many others of Smilax, together with gum berries, gall-bERRIES, and a profusion of others with which the swampy thickets abound, as well as winged insects, of which it is exceedingly fond."

**Geographical Distribution** — The Mocking Bird, says Wilson, "inhabits a very considerable part of both North and South America, having been traced from the states of New England to Brazil, and also among many of the adjacent islands; much more numerous in those states south than north in the latter, and resident at least in many of them in the former. A warm climate and low country, not far from the sea, seem most congenial to their nature; accordingly we find the species less numerous to the west than the eastern part of the United States, and especially on the borders of latitude. In the severe winter of 1808-9, I found these birds occasionally from Fredericksburg in Virginia, to the southern parts of Georgia."

**Nutall states that it inhabits the whole continent and the adjacent islands, from Rhode Island to the northern parts of the West Indies, continuing through the equatorial regions, and as far south as Brazil. Nor is it confined to the eastern or Atlantic states; for it is found in the territory (now known as) Texas, and more than a thousand miles from the mouth of Red River. Says notice as it breeding and the western sources of the Platte, near the base of the Mackinaw.**
line of eight companies, a battalion of light infantry of six companies, three companies of dragoons, a company of artillery, one of pioneers, and one of veterans. These corps are recruited by voluntary enlistment with bounty money.

There are two "battalions" urban, a band of city, one at Reggio and the other at Modena, besides a guards noble, or body guards, who attend the sovereign and his family. There is a military academy at Modena.

The establishments for public instruction consist of one lyceum at Modena; one college of physicians and medicine at Modena, Reggio, and Mirandola; three schools of philosophy, at Carpi, Correggio, and Castelnuovo, the chief town of Garfagnana; besides several colleges for the education of other religious orders.

There are five establishments for secondary education. One, built by nuns, four of which are at Modena, one at Reggio, and two at Carpi. For elementary education there are five schools for boys and six for girls, distributed among the various towns; but there is a general system for the rural communes. There are also seven special schools, namely, the academy of the fine arts, the military academy, the institute of cadets, a veterinary school, a school of sculpture at Carrara, and a deaf and dumb school.

The country is divided into four bishoppics. Modena, Reggio, Carpi, and Massa, and 649 parishes. Besides the chapters in each bishop's see, there are six collegiate churches, namely, S. Maria in Pompessa, and S. Consonato, in the diocese of Modena; S. Prospero, and S. Michele, in the diocese of Reggio; and S. Andrea at Carrara; besides the abbey of Nonantola. There are also ten clerical seminaries, one in each town of the state. The monastic clergy are more numerous in proportion than in most other parts of Italy; there are seventeen monasteries of men and twenty of women. Most of these are at Modena, Reggio, and other towns of the duchy.

The principal towns of the states of Modena are—1. MODENA. 2. Reggio, the Regnum Lepidi of the Romans, a walled town in the midst of the plain of Po, built, is a lively place, has several handsome churches, especially the cathedral; a leucem, which possesses the collection of natural objects that once belonged to Spallanzani; a handsome new theatre; an old castle, in which Sforza was born; three manufactories of linen and silks; and nearly 20,000 inhabitants. A great fair takes place annually at Reggio in the month of March.

Not far from Reggio are the ruins of the famous castle of Canossa, where Gregory VII. received the humiliating homage of the Emperor Henry IV., in 1077. 3. Massa, which is a powerful town, is situated on the river Pistoia, near the sea, and has 4000 inhabitants. 4. Pieve, on the Po near the boundary of Massa, has 2500 inhabitants. 5. Correggio, with 2500 inhabitants, was the birth-place of the great painter Antonio Allegri, called il Correggio. 6. Concordia, on the Secchia, has 3000 inhabitants. 7. Carpi, on the high road from Modena to Mantua, has 3000 inhabitants, an old castle, and some manufactories. (Serristori; Neuburger.)

MODENA, The Town of, is situated in 44° 37' N. lat. and 10° 57' E. long., in the centre of a wide plain which forms part of the great basin of the Po, and between the rivers Panaro and Secchia, which are here joined by a canal. It is the capital of the Modenese territories, and the residence of the duke. Modena is well built, and has several handsome churches and palaces. Most of the streets have arcades on each side; the principal street, which crosses the town from west to east, is one of the broadest in the whole of Italy. The ducal palace is vast and splendid, of a noble style of architecture, with a handsome court before it, surrounded by a colonnade; it is, in fact, a magnificent princely residence, the most as one would wish to find in the capital of a small duchy. The grand staircase; the principal apartments with their rich furniture; the gallery of paintings by Guido, Guercino, the two Carracci, Garofalo, and other great masters; the valuable library, 'Biblioteca Estense,' which contains 10,000 printed and 160 manuscripts, which has had two illustrious librarians, Muratori and Tiraboschi,—all these render the palace of Modena one of the most interesting in Italy. The fine gardens are open to the public. On the church of the cathedral of the eleventh century, is remarkable chiefly for its lofty square turret, called 'La Girlandina,' in which is kept the
famous bucket, which was the cause of war, in the thirteenth century, between Modena and Bologna, and forms the subject of Tacitus's mock-heroic poem, "La Scenica Rapita." The church of S. Agostino contains the tombs of two illustrious Modeneses, Signorin and Muratori. The other remarkable buildings of Modena are, the handsome theatre, the college, the infantry barracks, the hospital, and the old citadel; neither is now used as a penitentiary and a workhouse for the prisoners, who are employed in several manufactories. A canal communicating with the Panaro affords a line of boat navigation between Modena and the Po, and by the latter river with Venice and the coast of the Adriatic.

Modena contains 25,000 inhabitants. (Serristori, Saggio Stilistico.) It lies on the high road from Lombardy to Florence, Rome, and Naples, and is 40 miles south of Mantua, 75 south-east of Milan, 80 north-west of Bologna, and 60 north by west of Florence. Two roads lead from Modena to Florence: one, which is the most frequented, passes by Bologna; the other leads across a wild tract of the Apennines, near Mount Cimone, and descends into the valley of the Arno, by Pistoia and Mura, which is the ancient name of Modena, is said to have been founded by the Etruscans; it afterwards became a Roman colony. It was at Mutina that hostilities first began, after the death of Caesar, between Antony and the senatorial troops under Decimus Brutus; a battle was fought under its walls, in the month of April, a.c. 43, in which Antony was defeated, and the two consuls, Hirtius and Pansa, were killed.

In the neighbourhood of Modena is Sassuolo, the ducal residence and gardens. The fortress of Rubiera, which is the principal stronghold in the duchy, is on the road from Modena to Reggio. (Serristori; Neigebr; Valery.)

MODO, Ecclesiastical (Tuoni Eclesiastici), or, Tones of the Church. In what is called the Gregorian chant there are eight modes, or tones—four Authentic, and four plagal: [Authentic; Plagal.] The Authentic modes are the Dorian, Phrygian, Lydian, and Mixo-Lydian of the ancient church, according to St. Ambrose, who, according to St. Gregory, about 280 years after the adoption of the former, it must be observed, that the Gregorian chant has its dominant, but takes this name from being the note most often heard; hence it is frequently mentioned in the Gregorian schools as the key-note.

MDILLION (Architecture), an ornamental member in the Corinthian cornice, resembling a small bracket placed horizontally, that is, with its back against the soffit of the panel it supports, in which respect it differs from the console, which is placed upright, with its back against the vertical face of the panel to which it is attached, and with its larger or convex end uppermost, whereas the larger end of the modillion is placed backwards, and its smaller one in front. Yet though they thus far differ both as to the mode and the purpose of applying them, and also as to their details, in general form the modillion and the console closely resemble each other, the face being composed of a curve of contrary treflure. Mondillions are placed beneath the cornice of the entablature, though sometimes it is cut out of the pediment, or entablature as mutules are in the Doric and dentils in the Ionic cornice. They also admit of considerable variety, not only with respect to their design, but also their proportions. Some latitude also is allowed as to the distance at which they are placed from each other. The average or normal distance at which they are placed from each other is at intervals equal to twice their own breadth, but it sometimes moves, sometimes less, according to circumstances, and is in some measure regulated by the distance from the axis of one column to that of the next, because there ought to be a modillion immediately over each column, that is, in a line with the axis of it. This rule however is not very strictly adhered to, because the modillions are seldom so large as to render any want of perfect regularity in that respect very apparent. In general the soffit or curved face of the modillions are ornamented with a leaf; sometimes, on the contrary, the whole modillion is very plain, or rather is converted into a block slightly ornamented on its face. Where great recession is desired, dentils are also introduced beneath the modillions, and separated from them by mouldings, as is the case in the Jupiter Stator example.

MODOLLO, Mythol. Modulation, in music, is a changing of the key, or mode, during the progress of a composition. The word is derived from the Latin verb modulare, to compose or sing in measure, melody of some sort being inferred.

Though it is not quite clear what the antena meant by the term modulatio, yet the presentation is that they sacrificed by it the rise and fall of the voice (accentus) and the measure of the syllables in recitation and declamation, altogether amounting to a kind of singing; and thus we are inclined to think was the boundary, or nearly so, of their, propriety, and what they chiefly aimed at, in the vocal art.

In modern music, Modulation is a most important element, and in proportion to its importance would be the manner of treating it here, were our work a collection of treatises; but limited as we are in space, we must be confined to some general remarks, illustrating these by a few brief examples.

Modulation may be divided into Simple, Chromatic (or Minor), and Harmonic. Simple Modulation is a change from a given key to another nearly related to it, namely, its fifth, fourth, relative minor, or relative minor to its fifth; and this modulation, not to be abrupt, is effected by at least one intermediate chord, which must belong to the harmony of the key into which it is intended to pass.

Examples in four parts:—

\[ \begin{array}{c}
\text{c to c.} \\
\text{c to a minor.} \\
\text{c to b minor.}
\end{array} \]

The close resemblance of the scales of c, r, a minor, and x minor, to the scale of c, renders the modulation easy and natural; hence we have termed it simple. And a must now be observed, that the natural major key is here chosen as the diverging point merely on account of its apparent simplicity; any other would have answered the purpose, provided the same relations had been preserved. Thus, for instance, from the key of x to its fifth m as the relative same as from c to a.

Examples:—

\[ \begin{array}{c}
\text{1st case.} \\
\text{2nd case.}
\end{array} \]
In these examples we have endeavoured to show the most direct method of modulating, and, except in one instance, by means of the dominant 7th and the diminished 7th, or their inversions. By the intervention of a few additional chords, more elegant effects might have been produced, both as regards harmony and melody. But it must also be remarked that suddenness of transition is often essential to the design of the composer, in which case he takes the shortest road from key to key that the ear will permit.

It will be seen that we entirely differ from those who—perhaps misled by the word modulatio, and its interpretation by antient writers—think that modulation may be carried on without any change of key. We are decidedly of opinion, though in opposition to some highly respectable authorities, that modulation and change of key are identical terms.

MODULES (Architecture), from the Latin modulus, as being a lesser measure than the diameter of the column, is employed to signify one half of the latter, or thirty minutes. Some writers reckon entirely by modules and minutes. Thus instead of saying a column is eight or eight and a half diameters high, they would describe its height as being sixteen or seventeen modules.

MORIS, Lake. [EGYPT.]

MOSIA, the name of a province of the Roman empire, extending north of the road from Mount Hermon, the modern Balkan, as far as the Danube, and eastwards to the Euxine, and corresponding to the present provinces of Servia and Bulgaria. Its boundaries to the west were the rivers Drinus and Savus, which divided it from Pannonia and Illyricum. Strabo (vii. 295) says that the old inhabitants of the country were called Mysi, and were a tribe of Thracians, like their eastern neighbours the Getes, with whom they have been confounded [G. T. E.], and that they were the ancestors of the Mysae of Asia Minor. The Romans fixed their province under Augustus (Dion, cap. 51), and it was afterwards made into a Roman province, and divided into Mysia Superior, to the west, between the Drinus and the Moscus or modern Ister, and Mysia Inferior, extending from the Moscus to the Euxine. Being a frontier province of the empire, it was strengthened by a line of stations and forresses along the south bank of the Danube, of which the most important were Axioiopolis, Durostorus, Nicopolis ad Istrum, Viminacium, and Segedunum. In the interior of the country were the towns of Naissus, the modern Sardica, Marcianopolis; and on the coast of the Euxine, Odessus or Odessus, near the modern Varna, Dionysopolis, and Tomis, the place of Ovid's exile and death. A Roman wall was built from the Danube to the Euxine, from Axioiopolis to Tomis, as a security against the incursions of the Scythians and Sarmatians, who inhabited the delta of the Danube.

The conquest of Dacia by Trajan removed the frontiers of the empire farther north, beyond Mysia; but after the loss of that province, about A.D. 250, Mysia became again a border province, and, as such, exposed to the irruption of the Goths and occupied Mysia in the reign of the emperor Valens. The Mysae-Goths, for whom Ulphilas translated the Scriptures, were a branch of Goths settled in Mysia. Some centuries later the Bulgarians and Scyavonians occupied the country of Mysia, and formed the kingdoms of Bulgaria and Servia.

MOFFAT. [DUMFRIESSHIRE.]

MOGADORE. [MAROCCO.]

MOGUL EMPIRE is the name commonly given to the empire founded in Hindustan by the successors of Timur, in the sixteenth century. Baber, a descendant of Timur, and a prince of the Jashgai Turki tribe, after conquering Samarcan, Bokhara, and Cabul, crossed the Indus, and invaded the Punjab. He marched upon Delhi, defeated and killed Sultan Ibrahim Lodii, the Afghan sovereign of Hindustan, took Agra, a powerful city, and placed Ulphilas, a learned prince, extended his conquests to the mouths of the Ganges, and established his Tatar dynasty over those vast regions, 1526-8. As he had many Mongols in his service, and as he was a successor of a Tatar Burgh instead of a Tatar himself, and not a Mongol, had re-united for a time the old Mongol empire of Gengis Khan, the dynasty established by Baber in India became known in Europe by the name of the Mogul empire, and the misnomer has perpetuated itself in history. [MONGOLS.]

Babar, after distinguishing himself as a great conqueror, became also a wise administrator, and applied himself to promote the prosperity of his vast dominions. [BABAR.] He died in 1530, and was succeeded by his son Humaidin, a mild and good prince, who however had not the abilities of his father. The Patans, a tribe of Afghans, rose against him, and forced him to emigrate, and a Patan dynasty was established at Delhi. Humaidin however returned with a fresh force of Turcomans and other Tajirs, and re-took Delhi. He died in 1556, and left an unsettled throne to his son Akbar, then a mere youth.

Akbar, by means of his generals, re-took Agra from the Afghans, re-conquered Malwa and Behar, defeated the last chief of the Haidarabads, and subdued remote Nargis, Guerut and Sinde, and consolidated the empire in the house of Timur. For an account of his life see AKBAR. Deviating from the old principle that all the land belonged to the crown, and that the occupiers were yearly tenants, Akbar alienated many lands in favour of the actual occupiers, to whom he gave by an edict the right of transferring their property without the necessity of obtaining permission from the crown.
Akbar died in 1605, and was succeeded by his son Jehangir, a good though rather weak prince, who followed his father’s steps in his administration. Jehangir died in 1627, and was succeeded by his son Sultan Kurram, who assumed the name of Shah Jehan. He was an able prince, who extended the limits of the empire as far as the Ganges and Vizavore.

Shah Jehan was deposed in 1658 by his third son Aurangzebe, whose long reign was the most brilliant period of the dynasty of Timur in India. For particulars see Aurangzebe.

Aurangzebe died in 1707, and was succeeded by his son Bahadar Shah, who died in 1712, and was succeeded by his son Moaz ud Dien, styled Jehandar Shah, who reigned only eighteen months, and was succeeded by his nephew Firrokshe in 1713.

In 1717 Firrokshe was deposed, and deprived of his sight by two chiefs, Abdullah Khan and Hassam Khan, who raised to the throne Rafeel ul Dirjat, another grandson of Bahadar Shah, but put him to death after three months.

In 1742 Mahummad Shah, son of Jehandar Shah, ascended the throne, and having rid himself of the two rebellious chiefs, gave himself up to indolence and pleasure. In the meantime the Mahrattas had become extremely formidable, and the use of cannon was understood.

The reign of Ahmed Shah was still more disturbed than that of his father, by invasions of the Mahrattas, Rohillas, Patans, and other predatory bands, and by the ambition of the various chiefsthe governor of provinces. Ghazi ud Dien, the eldest son of the Nisam ul Muluk, being disappointed of his father’s inheritance by his brothers, after several attempts to recover it, died of poison, leaving a son, young Ghazi, who held an office of trust at Delhi under the emperor. He was of the youth and courageous for his master against various rebels; but Ahmed Shah, becoming jealous, endeavoured to get rid of him. Ghazi discovering this, marched upon Delhi, took it, and deposed Ahmed Shah, who was at the same time deprived of his sight, in the manner of the Royalty of Delhi. Ghazi then took the other prince of the blood, who assumed the name of Alumghir, while Ghazi, in fact, ruled the empire with the title of visier.

Achemdallah, of Herat, who, in the midst of the confusion which the affairs of Persia had fallen after the death of Nadir Shah, had formed a new empire in Afghanistan, invaded the Penjub, took Lahore, and advanced towards Delhi, ad 1757. Ghazi went out to meet him, but was forspoken by part of his troops in consequence of some neglect of Alumghir, who had lost his authority of his visier. Ghazi surrendered to Achemdallah, whose favour he won; and when Achemdallah left Delhi to return to the north, he left Alumghir as the nominal possessor of the throne, under the name of emperor. In 1759, Achemdallah entered into Hindustan, encouraged by Alumghir, who kept a correspondence with him, which was discovered by Ghazi, the latter caused the emperor to be assassinated. He then placed on the throne another prince, who was called Shah Jahan II, and was obliged to submit to Achemdallah, who entered Delhi, and raised enormous contributions, in consequence of which a revolt having broken out among the inhabitants, a general massacre ensued, and a great part of the town was destroyed by fire, ad 1761. Then came a new invasion of the Mahrattas, who entered Delhi after Achemdallah’s departure, obliged the visier to escape, deposited Shah Jahan, and raised another puppet prince to the throne. Meanuis Shah Jahan II, the son of Alumghir, had himself proclaimed emperor at Patna, under the protection of the Soudbadar of Bengali, Surajul Dowlait. The Soudbadar being defeated by the British forces, Shah Allum came into the hands of the latter, who gave him the town of Allahabad, and part of that province, for his subsistance. After numerous subsequent vicissitudes, Shah Allum died in 1804, a pensummed English; and with him expired the line of the Mahrattas, commonly known as the Mogul Empire, may be considered as having terminated, and the British East Indies Company, after half a century of wars and conquests, succeeded to a splendid inheritance.

Hawkins, History of Hindostan, the death of Akbar, translated from the Persian, with an Appendix, containing the History of the Mogul Empire, from its decline in the reign of Mohammed Shah, to the present time, London, 1734. A more complete account of the death of Akbar, with an Inquiry on the State of Bengali, London, 1772. See also a Chronological Account of the Connection between England and India, in the Companion to the Almanac for 1788; on the Diffusion of Useful Knowledge.

MOGBULUNDI (Hindustan, p. 210)

MOHAMED, ABUL KASEM IBN ABDALLAH, was born at Mecca, on the 10th of November, 570, or, according to some, on the 16th of August, 570. His father Abol Kassim, whose only son he was, belonged to the family of Hashem, the most distinguished branch of the noble tribe of Kureish, which claimed a direct descent from Ismael, the reputed progenitor of the Arabian race, and had acquired the kingdom of Arabia, and the superiority of its successors. Owing to an active and uninterrupted commerce, the Kureishites were not only renowned for their opulence and refinement, but, being concentrated about the ancient seat of the common Arabian worship, they were the hereditary custodians of the holy Kaaba of Mecca, the custody of which, together with the sacred natural office, had for a long time been the privilege of the Hashemites, the ancestors of Mohammad. Mohammadian authors have laboured to adorn the life of this great man with many miraculous events, such as the Persian sacred fire being suddenly extinguished, and a splendid light having spread over all Arabia; but these and similar embellishments of his life, with a great number of prodigies attributed to him, we may leave to the credulity of his enthusiastic followers. In his early childhood Mohammad lost both his parents; his mother Amina died a second year, and the child was committed to the care of his aged grandfather Abol Moteleb, who was then the chief priest of the Kaaba. Abol Moteleb was succeeded by Abu Talib, who received him into his house as a poor chimney. He became his guardian, and with whom he made several journeys and mercantile adventures, principally towards Syria, and to the fairs of Damascus, Bagdad, and Basra. In his twentieth year Mohammad took part in an expedition in which his cousin Abu Talib was killed. On the death of his uncle he set out with the Arabians and pilgrims on their way to Mecca. This wandering kind of life and the practice of warfare animated the youth with an eager desire of adventure and military achievements, and with that spirit of chivalry which may be considered as the form of his future greatness. To this must be added a strongly marked propensity to solitary retirement and to religious abstraction, originating probably in his early contemplation of the absurd ceremonies and crotology of his contemporaries which he witnessed at Mecca, and in which he had been wont to take part. After having placed the famous black stone in the wall of the Kaaba when the temple happened to be repaired.

A Nestorian monk, the abbot of a monastery at Basra, took Mohammad into his apartment, and appreciated the character of young Mohammad. After being conversed with him on religious subjects, he foretold to his name Abu Talib that great expectations might be conceived of the boy provided he should escape the snare of persecuting enmities and the general jealousy which will be explained in the course of this narrative.

In the twenty-fifth year of his age Mohammad became acquainted with a rich widow Khadija, whom he subsequently married; and during the fifteen following years little more is known of him than that he prepared for his intended journey to the holy soil of Arabia, to the meaghering mountains, and also Syria and occasional visits. During these journeys he
and in such degree as circumstances permitted, and he is said to have conversed most familiarly with some learned Jews and Christians, among whom are particularly mentioned a celebrated rabbi, Abdullah Ibn Salsam, and Waraqa, the nephew of his wife, who first deserting his native pelt through a desire of faith and suppressed the Christian religion, and was well acquainted with the Old and New Testament. (Abulfeda, Annuales, L. 283; Marcoceio, Prodomus I, 44.)

In the fortieth year of age Mohammed assumed the prophetic office, and displayed his views and principles to his own domestic circle. His first efforts were successful for his wife Khadija, Waraqa, Abubeker, his cousin-german Ali ben Abu Taleb, and several other members of the family, received him, acknowledged his divine mission, and himself as the Apostle of Allah.

After being three nights silently employed in the conversion of his nearest friends; he invited the most illustrious men of the family of Hashem to his house, and after having conjured them to leave idolatry for the worship of one God, he publicly proclaimed his calling, and declared by the command of that one God, revealed to him by the angel Gabriel, he felt compelled to impart to his countrymen the most precious gift, and the only means of their future salvation. For he struck the daring assemblies of the polytheists with surprise mingled with contempt. The young and enthusiastic Ali alone, throwing himself at the feet of Mohammed, with a solemn vow offered to be his companion, but his base master Abu Taleb, who considered the prophet to abstain from his strange and fanatical desires, Mohammed replied, that even if the sun should be placed on his right hand and the moon on his left, they should never divert him from his career. Stimulated rather than dissuaded, Mohammed was soon determined, took place at the doors of the Caaba. It is reported that he had the honour of thus converting the celebrated poet Libid, who, struck with the sublime beauty of a passage thus promulgated, declared it far superior to any production of human genius, and joined him in the profession of Islam. The people, listening to the precepts of the moralist, and though they were enraptured by the force of his eloquence, very few were yet inclined to desert their hereditary and long-cherished religious rites, and many still clung to their religion, the guilt of infidelity. The only miraculous act which Mohammed professed to have accomplished, and which has been greatly exaggerated by his credulous adherents, is a nocturnal journey from the temple of Mecca to Jerusalem, and then through the heavens, which some credulous persons have performed on an imaginary animal like an ass, called Burak (lightning); but we need scarcely remark that the simple words of the Koran (Sura xvii.) may as well be taken in the allegorical sense of a vision.

In the meantime several of the noblest citizens, such as Abu Obeida, Hamza, an uncle of Mohammed, Othman, and the stern and inflexible Omar, were successively gained by the moderation and influence of Abubeker, with whom, by marrying his only daughter Ayesha, the prophet had become more closely connected, and the conversion of these denominates had an effectual faith on the unbelievers against the whole line of Hashem. Although menaces and persecution, too often repeated to be minutely related here, had compelled the few votaries of Mohammed to retire into Abyssinia, the spirit of party continually kindled and rekindled. At last the revolt, which threatened the life of Mohammed, broke out at Mecca, and the prophet took his flight to Yathrib, afterwards known by the name of Medina (Medinat-al-nabi), or the city of the prophet. This retreat happened on the 16th of July, 622, and the citizens of Medina, among whom the seeds of Islam had been sown by some converted pilgrims returning from Mecca, were readily inclined to embrace the cause of the reformer, whom they had often invited by several previous deputations, and to whom they had promised their alliance and protection against his enemies. Accordingly they advanced in force to meet the besieged prophet, invested him with the regal and sacerdotal office, and offered their assistance in propagating by force the tenets of his new religion. From this moment a vast theatre opened to the enthusiasm and ambition of Mohammed. His revelations assumed a much more definite form, and his new religion and of faith the waging of war against the infidels; and the sword once drawn at the command of Heaven from that time remained unsheathed until the tribes of all Arabia and the adjacent countries had joined in the profession that there is no god but Allah, and that Mohammed is his apostle.

After various enterprises and petty excursions, three great battles were fought with the Koreishites under Abu Sophian, the most imitable foe of Mohammed and of the Hashemite line, who, after the death of Abu Taleb, had succeeded to the principality of Mecca. A military force of nearly a thousand men had been collected by Abu Sophian, in order to protect a wealthy caravan on its way to Syria, and to quiet the prophets through fear of being attacked by the hundred warriors, awaited them in the valley of Beder, twenty miles from Medina. The Moslems, inflamed with enthusiasm and expectation of booty, furiously assailed the enemy, who, after a short battle were totally defeated and dispersed, leaving, before the eyes of the Aulāyds, the spoils of the war. The Moslems then avenged this disgraceful defeat Abu Sophian advanced in the following year (Hejra 3) with an army of three thousand men towards Medina, and a bloody action, in which Mohammed was severely wounded, took place at Uhud, near the mountain of Ohud. The Koreishites were now vanquished, but the Moslems soon rallied in the field, and a third war, during which the city of Medina was besieged for twenty days, was terminated by a single combat of the valourous Ali. Surrounded by a number of friends and admirers, who defended him with all their strength, or at least of a doubtful disposition, the idolaters either wanted strength or courage to protract hostilities, and accordingly an armistice of ten years was agreed upon by both parties. This interval Mohammed employed in converting or subduing the principal Jews of Medina, namely, the Maceb, Kako, Koraisha, Nadhir, and Chaabar. (Abulfeda, Vita Moham., p. 67; Pococke, Specimen Hist. Arabian, p. 11.)

The castles and towns of the unwarlike Jews were rapidly taken and plundered, and the unhappy people, being unwilling to ensure the felicity of their country by being driven out, or persecuted and slaughtered with the utmost cruelty. But the prophet paid dearly for this, as he never entirely recovered from the effects of poison prepared for him by a Jewess, who, having broken the three hundred and sixty idols round the Caaba, and destroyed every vestige of idolatry, he adorned and consecrated the temple to the worship of God. In doing this he himself set an example of the most inviolable prayer and justice, and fulfilled the religious duties and ceremonies which the pilgrims to the holy shrine had there formerly invariably observed. The conquest of Mecca, and a subsequent prosperous expedition against the hostile tribes of Taif, and afterwards against the ecolatrous tribes over all Arabia, and even the petty chiefs of the neighbouring provinces presented gifts or offered their friendship and alliance to the victorious prophet. Intoxicated with ambitious pride, Mohammed now despached his ambassadors to Khorrar Persia, to the Emperor of Byzantium, and to the king of Abyssinia, solemnly inviting them to the profession of Islam, or threatening them with war. Accordingly an army of three thousand Moslems invaded the eastern territories of Palestine, and through this and a subsequent expedition to the west were only momentary excursions, a number of foreign tribes
and cities willingly submitted. This arose principally from the clemency and moderation of the prophet towards the Christians, from whom he claimed only a moderate tribute, and to whom he most liberally granted his protection, security and freedom of trade, and toleration of their worship, and whose conversion to his religion he rather expected than enforced. On this occasion a pestilence was sent upon the inhabitants of Mecca, and the name of 'Tentamentum Mohammedae,' was formally published, which, whatever may be thought of its authenticity, is at least in accordance with many passages of the Koran, declaring that no force shall be employed in religion; that the prophet in no wise contend with sword and subdue the people, they shall not be governed by violence, and that the believers shall leave those who do not believe to the punishment of God, for He is the only arbiter, and will reward every one as he deserves. (Sur. ii. 257; xlv. 14; lxxxvii. 21, &c.) Returning from these military expeditions, and having once more accomplished a solemn pilgrimage to the temple of Mecca, Mohammed retired to Medina, where, to the great consternation of his followers, he died, after a second festival of fourteen days, on the 8th of June, 632, in the sixty-third year of his age. Omar, with many of his enthusiastic disciples, firmly believed that a prophet could never die; and it required all the authority of the sober and prudent Abubeker to refuse so absurd an opinion. Is it possible, therefore, to doubt the direct succour of God in the multiplication of his followers and the attainment of the reign of the God of Mohammed, whom you worship? The God of Mohammed liveth for ever, but the apostolate was a mortal like ourselves, and has experienced the common fate of mortality. How then was it rapidly sketched the political life of the Arabian prophet, by whose noble aspirations and intrepid courage the hostile tribes of an immense country were for the first time united in faith and obedience; and before discussing the principles of a religion, which, during the second year of a century, displayed its victorious banners in all Arabia, Syria, Asia Minor, Persia, Egypt, and the coasts of Africa, and whose precepts even now are zealously followed from the Ganges to the Atlantic by more than a hundred and twenty million of people, is it possible to ignore the circumstances of the name of the state of Arabia previous to the introduction of Islam. The aboriginal inhabitants of the peninsula had, from time immemorial, been divided into a great number of free and wandering clans, limited communities, and petty states, whose peculiarities of character, mode of life, and political institutions, as they were mostly dependent upon local circumstances, were for centuries stamped with the same unalterable features, and had been preserved almost unchanged even from the time of the Book of Genesis. The mountain table-land of central Arabia, abounding in rich pastureage and fertile valleys, but at the same time intersected and skirted with dreary wastes and sandy plains, was occupied by those roving tribes who, in opposition to the settled inhabitants, preserved the name of the nomad, and the bare life of the plain. Most of them were addicted to a wandering pastoral life, but from being strongly disposed to war and chivalrous adventures, their peaceable occupations were interrupted, either by conducting a caravan of merchants, or still often by assailing and robbing their fellow-tribes. Every tribe was governed by the most aged or worthy Sheikh of that family which had been exalted above its brethren by fortune and heroic deeds, or even by eloquence and education. In the ancient religion of the heroic barbarous Barbarians and the Lamecdians, by whom the vices and virtues of their countrymen were impartially censured or praised, a noble enthusiasm for poetry animated those Arabs, and at an annual fair at Okbad, thirty days were consecrated to poetical amusements. The itself was written, and the holy books were written in letters of gold and suspended in the temple of Mecca. Those meetings however formed only a very feeble bond of union among the independent and hostile tribes, who only occasionally, and in cases submitted to a supreme chief, or Emir of Emirs, and who had never yet been united into one body. And the tie was still less binding on those inhabitants who, being collected in flourishing towns and cities on the coasts of the peninsula, and mostly employed in trade and culture, were regarded with supreme contempt by the free Beluins, as a weak and degenerate race of slaves. The worship of the Arab tribes chiefly consisted in the adoration of the heavenly luminaries, which were considered as so many tutelar deities of the different tribes; and among which, after the sun and moon, the planet Venus had acquired such peculiar pre-eminence, that even in the Moslem age the rows of the Pantheon of Arab idolatry at Mecca; and their worship was accompanied, not only with the most horrid rites and shocking ceremonies, a degraded paganism, but even with human sacrifices and cruelties of every description. Even children were immolated on the altars of the bending idol, and the houses of the Keddites, buried their daughters alive (Sur. vi. 137; xv. 58; xxxi. 8), and we need scarcely remark, that except vague belief of the soul becoming transformed into birds in a space of time, there is no indication of the Arab idolaters believed in a future life and final retribution. (Poaceae, Specimen Historiae Arabant, ed. White, 1866.) Among the foreign settlers in Arabia, we pass over in silence the few adherents of Zoroaster, scattered along the Persian gulf, and the Sabians, on the southerm coast of the peninsula, who, even from the time of David and Solomon, stored their rich emporiums of Ophir, Saba, and afterwards Aden, with Indian merchandise, and who, as is clear from many good arguments, were the aboriginal inhabitants, the descendants of the Ribbonals, who long been established in several parts of Arabia, but the Christianity of the Oriental church, at that time, is almost unconnected with the worship of martyrs, relics, and images. As a result of the above considerations, it may be added that the ethical and other abstruse dogmatical controversies, base upon each other with the utmost hatred, we find particularly mentioned the Nestorians, Jacobites, Maronites, and Mohammedians, besides some other obscure sects, such as the Christian, who, by some other appellation, Christizing her as the third person in the Trinity, probably gave rise to the Christian trichism so often dwelt on by the sister of the Koran. After the destruction of Jerusalem, the Jews were scattered, and we may feel it necessary to recollect the loose connection and the jealousy of the aboriginal tribes, they had gained considerable power. Many of them, adopting the fierce manner of the desert, who desired being connected with all its dangers and adventurous strife, in a poem composed by a Jew in the Methom, which breathes the true spirit of Arabian chivalry. (Hammââ, p. 49, Frey.) But in general the Jews were peacefully settled in towns and fortified castles principally along the coast, or dispersed among the inhabitants of the peninsula, of whom the Arab races had been in the Arabic reformation and most eagerly sought for by poets, and his early predilection in favour of the possession of Scripture, as they are honourably called, might be attributed by innumerable passages of the Koran. He not only approved of the religious customs, or practices of former times, and consequently in his religious practice, the nature of the divine mission (Sur. ii. 134; x. 93; xxxvii. 77; xxxiv. xiv. 16), but to gratify the Jewish superstition, he even structured his first disciples to direct their prayers towards the holy shrine of Jerusalem, which was afterwards altered in favour of the Caaba. (Sur. ii. 134-146.) But the followers of the Mosaic institution, being then already entangled in their fanciful Talmudic lore, were by no means inclined to receive the new religion, as represented by the prophet, and when the most fervent persuasions of the prophet were repeatedly answered by ironical sneers and unguised contempt, his former friendship was converted into an impalpable hatred, and the Jews were accordingly stricken into exile. The kingdom of the Medes was with Mohammed, as prophecies, as interpolators of sacred Scripture, and, in pretending to be the chosen people of God, the destruction of the holy place of mankind. (Sur. ii. 88, 137; vi. 21, 74, 85.) Nevertheless the Jews and were, particularly to the above-mentioned rabbi, Alidollah, and Sultan, Mohammed was instigated for that ample knowledge of biblical history, and for all those dogmatical legends, of orifinal ornaments, and absurd interpretations of Scripture.
law for many millions of mankind: a work which, from the force and sublimity of its style, has been for centuries admired, and has become the model and standard of all Arabic writers, and whose language is even now the vehicle of communication for nations between the Polynesian islands and Africa. It is considered by all these nations as the inexhaustible source of their happiness on earth, and as the only means of their eternal bliss and salvation hereafter; a work which, according to pious Moslems, was written before the throne of God was established on the earth, and which, according to some, is the genuine Koran, on which a mere copy was brought down and revealed to Mohammed by the angel Gabriel.

The Koran (lecture), or with the Arabic article, Alkoran, commonly called the book, or book of Allah, both in imitation of the sacred Scriptures of the Jews, as the Talmud, and of this particular book, as the Mahabah of Alkoran, namely, Miqra and Khitab, is a collection of all those various fragments which the prophet, during the time of his apostolic office, successively promulgated as so many revelations from heaven. It would be almost impossible to characterise the leading features of the Koran, or even to give a full and clear account of its contents; for the chronological order of the incoherent rhapsodies has been neglected, and we are at a loss either to trace any logical connection in the series of disconnected and often contradictory statements or passages. But when the understanding is applied to this in a work which otherwise might have served as an official journal of the progress of Islam. According to the momentary feelings of the prophet, his frame of mind, or the mere suggestions of his fancy, pious meditations and fervent wishes have been committed to writing, and handed down as sacred traditions. Apostles of Allah to the listening apostle, and of course to the refractory unbelievers, are interrupted by legendary tales and fabulous traditions of the ancient Arabic heroes and tribes; and religious customs have been worth remarking above all, because those of the accompanying admirers, and the most energetic recommendations of gratitude, charity, patience, and piety, are occasionally illustrated or strengthened by examples of the biblical patriarchs and prophets, and sententious remarks are added, to the purity of the language, which is the most refined dialect of Hejaz, and the harmony and copiousness of the style, which in splendid imagery, bold metaphors, and occasional rhyme, rather resembles poetry than prose, and, though sometimes obscure or verging upon tautology, is generally vigorous and sublime—and we may readily acquiesce in the judgement of Goethe, that the Koran is a work with whose dulness the reader is at first disgusted, but is afterwards attracted by its charms, and finally ravished into the most rapturous apostleship on earth. The Koran had been originally preserved by oral tradition, or handed about in fragments, written on palm-leaves and pieces of parchment by the slave of Mohammed, Badr bin Zaid. The scattered portions were collected into a book by Abubaker, two years after the death of the Apostle; and many apocryphal additions having crept into the collection, an authentic copy was afterwards revised and sanctioned by the Caliph Omar (652). The code is divided into 114 chapters. But men of knowledge (1530), was written in the name of Jacob, or Medina, where they had been promulgated, and with the number of verses which they contain; but they are mostly arranged according to their length, and without any regard to chronology, the seventy-fourth and ninety-sixth chapters being supposed to have been the first revealed. Among the numerous illustrations of the Koran we may notice the celebrated commentaries of Abul Kasem Mohammed Al-Samakshari, and Nazriuddin Al-Beihdii (in the twelfth and thirteenth centuries), both of whom have written with the most consummate skill and judgment. Among the most curious contradictions of the work, and to explain its occasional obscurity, mostly by means of that recognised oral tradition which, recording in more than 7000 anecdotes the private life, opinions, discourses supposed to have been given by the Apostle, has been collected by Abu Abdullah Mohammed Al-Bochdi in the ninth century. This collection, compiled with a previous controversy respecting the exclusive right of Ali or of Abubaker and the two following caliphs to the supreme power, is still the most popular of the orthodox to this day. The great division of the whole Mohammedan community into Shiites, or sectarians, by whom the authority of tradition is rejected, and Sunnites, or orthodox believers. (AABBREVIATIONS) The first printed edition of the Koran, by Paget (1530), was written in the name of the pope; and that of Lud. Marracci was not allowed to appear unless attended with a Prodomus et Reformatum Alcorani, Padua, 1698, folio. A quarto edition of the text by Abbr. Hinkelmann (Hamb., 1694) has been critically reviewed and reprinted by G. Fugueg (Leipzig, 1834). A French version by Savary (1783), carefully corrected by Gauric de Tassy, appeared in 1825. The English translation by W. H. Blomfield, of the English Commentary on the Koran in single and often-repeated precepts. It consists of two parts: of a dogmatical (or Imman) faith, and a practical (or Dino) religion. The principal articles of belief are the following:—There is but one God, eternal, omnipotent, and omniscient, to whom heaven and earth, meditation and adoration are due, and whose majesty is daily proclaimed by a host of angels above, as well as by his own works around us; he is the author, preserver, and governor of the universe, and the supreme ruler of fate, by whose divine providence and absolute predestination the destinies of mankind have from eternity been decreed. The will of God and his divine law were often and fully declared by the former prophets, Adam, Noah, Abraham, Moses, and Jesus; and the highest revelation is just gradation above each other, but among whom Abraham was the chief prototype of a true believer. The patriarch was neither a Jew nor a Christian, for he believed in the unity of God: he was a religious Moslem, and the friend of God, and above all, the Apostle of Jesus (Sur. ii., 134; xvi., 129). Nor is Isaac to be considered as the beloved son of the patriarch; for it was Isaac, the pious father of the Arabian race, whom God asked for a sacrifice (xx., 55; xxi., 65; xxvii., 101); and it may be worth remarking, that Abraham's sacrifice was so often so totally absorbed by his thoughts, and the truth of his assertions so deeply worked on his mind, as to identify his own feelings with those of the biblical characters. The most popular prayer is the one addressed to Saviour: 'Verily, Christ Jesus, the son of Mary, is the apostle of God, and his word, which he conveyed unto Mary, and a spirit proceeding from him, honourable in this world and in the world to come; and one of those who approach near to the presence of God. Yet Jesus was a mere mortal, and not the son of God; his enemies conspired against his life, but a phantom was substituted for him on the cross, while he was translated to heaven' (iii. 54; iv. 136, 139). But, after all, Mohammed is the last and by far the most perfect of all the prophets (xxiii., 40, the divine missions have ceased; and as the Scripture and Gospels have been altered by superstitions and idolatrous Christians, the Koran must be revered and observed by them), and the only authoritative written revelation which is corroboreated and verified (ii., 89; xvi., 11). The soul of man is immortal, and at the day of resurrection and the final judgment of mankind every one shall receive the just reward of his virtues, or the punishment due to his evil deservings. Sinners, and particularly unbelievers and idolaters, shall be hurled about in a dark or burning hell; whereas the virtuous and pious Moslems shall be rewarded with everlasting happiness in a paradise, enlivened by heavenly virgins, and abounding with shady groves, clear streams of water, and delicious fruits—the most desirable enjoyments in the sandy deserts of Arabia. But the hope of salvation is not confined to the Moslem, for every man who believes in God and does good works shall be saved. Beside the most obvious and obliging duties, which promote the propagation of Islam, and which we have already noticed as incumbent on every Moslem, the first practical duties are, prayers directed towards the temple of Mecca at fixed appointed hours of the day, fasting during the month of Ramdan, and in the tent where each part of a person's property must be appropriated, and which must be bestowed even on foes and on the brute creation. Prayer will carry the Moslem half way to God; fasting will bring him to the door of his palace; but charity and the keeping of the commandments of the Supreme Being is best worshiped, will gain him admittance. Cleanliness of body and frequent religious ablutions are strongly recommended, and likewise attendance at divine service in the mosques on every Friday; and in this regard, if the performance of a holy pilgrimage to the temple of Mecca, the sacred birth-place of Islam.
Arabian custom of circumcision, generally practised in the eighth year, the legislator retained; and in many usages and ceremonies he indulged the prejudices of his countrymen, either by connecting a prevalent superstition with the moral of a purer faith, or by restricting an abusive practice within its just limits. For example, instead of the former polygamy, four wives at most were legally allowed, and the matrimonial rules were more strictly regulated. The Koran significantly, wisely, but subtly, adumbrates, allusively, perversely, false testimony, Usury, gaming, and the use of wine and pork, are strictly forbidden; and it is but doing justice to Mohammed to observe, that every precept enjoined has been observed. Their cows had hitherto continued his own example, if we except his incontinence with the sex. The prophet married no less than seventeen wives, strangely enough all widows, except Ayesha, the daughter of Abubeker. This sensuality, almost the only stain on his character, can neither be palliated by the natural temperance of the Arabs nor by his hope of posthuma and ideal succession, which nevertheless failed, as the four sons of Mohammed died in their infancy. But we hardly need to apologize for the infirmities of a great man (and a great man Mohammed certainly was), who in every respect is described as a perfect model of Arabian virtue, brave and liberal, eloquent and vigorous, noble and simple in all his dealings, and of irreproachable morals. That fraud, cruelty, and inhumanity which have so often soured the propagation of Islam, cannot be denied; but a religious enthusiast is compelled to act according to the overpowering suggestions of his imagination, which he easily persuades himself to be the inspirations of Heaven, and according to his own conception of the importance and object of his mission. As to this, the prophet repeatedly and in the strongest terms expresses his purpose of uniting and reconciling the hostile tribes of his country by destroying their gross idolatry, and by bestowing on them the most salutary and precious gift of a purer faith and the grace of the divine word, which he himself firmly believed. And indeed it will readily be admitted that the religion of the Koran, by which prayers and alms were substituted for the blood of human victims, and by which the abominations of idolatry and superstition, lust and lying, and idolatry, breath and spirit of benevolence and social virtues, has been a real blessing to the Eastern world, and has had a most important influence on its civilization. It is not merely to the conquering sword and to the intrepid courage of the reformer and his successors, but also to the intrinsic merits and attractive features of a system, rich with all the luxuriance of Eastern poetry, and most congenial to an ignorant and sensual generation, that the rapid progress of the Arabian conquests must be attributed, although favoured and promoted by the creative, original, and powerful impulse of the revolutions, and weakness of the neighboring governments. (Arabia, p. 216; and for the further development of Islam, see Adr. Roland, De Religione Mohammedica, Utrecht, 1842.)

MOHAMDAR. [Sanskrit Literature.] MOIAWK, River. [New York.]

MOHAWKS. [Iroquois.]

MOHILEW, or MOGILEV, a government of European Russia (in the division called West Russia), lies between 55° 5' and 55° 10' N. lat. and 29° 50' and 33° 40' E. long. It is bounded on the north by Vitebsk, on the north-east by Smolensk, on the south-east and south by Tschernigow, and on the west by Minsk. The area is 19,350 square miles, and its produce consists of grain, wool, flax, and some of the finest tobacco. It contains no mountains, but only hilly and the high banks of the rivers. It has fewer lakes, marshes, and low fens than some of the adjoining provinces, for instance, Vitebsk; the soil is not so sandy, and on the whole more productive. The principal river is the Dnieper, which comes from Smolensk and flows first west and then due south. It receives on the left the Swinaja, the Boholanka, and the S.asha, which last comes from the glacial circles of eastern Russia; on the right the Dnieper is joined by the Druze and the Berusia, of which latter only the mouth is in this province. Most of the lakes are in the north-west part; there are the Dulef, the lakes of Pol, and the Semenje; the others resemble large ponds. The climate is drier and milder than in Vitebsk; and apples and pears, which there thrive only in sheltered spots, succeed here without any particular care. The chief occupations of the inhabitants are agriculture and the breeding of cattle. The soil is equally favourable to both, and if the higher lands produce the finest corn, the low grounds on the banks of the rivers yield the most nutritious pastures; but both those branches of rural economy are in a very backward state. Bad harvests sometimes occur, chiefly in consequence of careless cultivation, or of unfavourable seasons, but a general failure of the crops is rare. Rye is the principal bread corn; wheat is only grown on the estates of the nobility. Barley and oats are raised everywhere, and buckwheat in the most sandy soils, where no other kind of grain will grow; it is used in the form of groats, mixed with flour, and the poultry, especially turkeys, are fattened on them. Peas and beans are cultivated almost exclusively on the lands of the nobles. Almost all the landowners have kitchen-gardens and orchards; in the latter all kinds of fruit are cultivated, chiefly however apples and cherries. Hay and pastures are grazed in the gardens, and clover grass (festuca fluitans, Linn.), here called mauna, is found in the fields and in some parts gathered. In the forests and low grounds there are prodigious quantities of bilberries and blueberries. The forest is a great source of revenue; in particular the banks of the Soschka and the Druze, and the whole circle of Tschernikow, are covered with the finest fir, which are partly felled for the Black Sea fleet, and floated down the Dnieper. The crown forests are however of importance, they provide the country with the necessary wood, which is not otherwise easily obtained. The large game is scarce; hare and ferreted game of all kinds abound. The fisheries are productive; the Dnieper and Soschka yield annually above 40,000 pods (a pod is 36 lbs.) of sturgeon and shad, the whole of which is exported to foreign countries. The manufacture of bog-iron, which might be a source of great profit, is not turned to much account. The manufactures are incomparable, and a few years ago were confined to some tanneries, and flax and hemp, and paper-mills. Of late years, that is, since 1820, great improvements have been made, and it consists in the exportation of corn, flour, fish, hemp, linseed, timber, cattle, honey, wax, wool, tallow, hides, and some manufactures. The principal trading towns are Mohilew and Minsk. The inhabitants of the province, nearly a million, are for the most part Russkians or Little Russians, who speak a dialect which is a mixture of Polish and Russian; Great Russians; some Poles, to which nation most of the nobles belong, and Jews, who are pretty numerous in the town of Mogilew. The language of the common people is that of the Russian (or not-united) Greek church. Some are of the United Greek church; but Brinsmen says (in 1819) that most of them had returned to the not-united Greek church. The Greek churches have an archbishop, to whose see also belongs the archbishop of Mogilew; the Roman Catholics are also numerous, and have an archbishop resident at Mohilew. There are a few Lutherans; the Jews are very numerous; they have synagogues and schools in almost all the towns, and have got into their hands almost all the retail business, the sale of brandy, and some of the trades or professions. Gipsies are numerous. Mohilew, the capital of the province, is a considerable town, situated in 53° 50' N. lat. and 29° 25' E. long., in a large and productive district, and on the Dnieper, and Druze. It is the residence of the civil and military governors, and of the Greek and the Roman Catholic archbishops. The latter is the superior of all the Roman Catho- lics in Russia and Poland. The city is surrounded with a decayed wall, which is divided into streets, the streets of the streets are broad and paved, and in the centre of the city there is a large square, or rather octagon, surrounded with stone buildings. The public edifices are, an old castle of the Counts of Moustique, on the town; sixteen Greek churches, of which that of St. Joseph is the largest; archbishops' palaces; two Greek and two Roman Catholic convents; two synagogues; a Lutheran chapel; and a stone
There are two seminaries for Greek priests, a gymnasium, seven schools, six poorhouses, and an infirmary. The tanneries are of considerable importance, and there are some manufactories of iron articles. The adjacent country being very fertile, the inhabitants have extensive gardens, which are a source of great profit. They have very considerable trade, which was formerly chiefly directed to Riga, Königsberg, Memel, and Danzig, but of late years has turned to Odessa. The population has much increased of late years: Stein states it at 12,500, Hassel at 16,000, and Danzig at 10,000.

The other principal towns are, Misialaw, 5000 inhabitants; Dubrownaw, 4000 inhabitants; Skiow, a fortified place, 2500 inhabitants; Orcha, 4000 inhabitants; and Homel, in the latter of which there are 9 villages and 20,000 inhabitants. There is in the town a Lutheran school for 400 peasant children, 200 of whom are boarded and instructed in handicrafts, agriculture, and gardening.


MOHILLA. [Comoro Islands]

MOHSITE. Crystallized titanium of iron. The primary form is a rhombohedron. The crystals occur attached and macle. Mohsite was formerly used in making black pepper, but is insufficient to scratch glass readily. Brittle. Colour black; streak the same. Lustre metallic. Opalescent. Does not obey the magnet. Found in Dauphin.

MOINGORE. [Money]

MOISSAC, a small town south of France, capital of an arrondissement in the department of Tarn et Garonne, in 44° 7' N. lat. and 1° 5' E. long., 426 miles from Paris by the road through Orleans, Châteauroux, Limoges, Cahors, and Moissac. This town was first noticed in the fifth century, when it was taken from the Romans by the Goths, from whom it was shortly after taken by the Franks. It was plundered by the Northmen, and subsequently came into possession of the Albigenases, who avenged it on their return by Saint Louis and Montfort. The wars of the English and the religious contests of the sixteenth century completed its ruin. The remains of the ancient walls show how far its former extent exceeded its present size.

The river is navigable for about three or four miles above its junction with the Garonne. The houses are tolerably well built, and among the most striking objects are the public fountain and the bridge over the Tarn. The country round the town is very fertile, singularly fertile, which is owing to its being rich in water, and of delicious fruits. The population in 1831 was 5950 for the town, or 10,165 for the whole commune; in 1836 it was 10,018 for the commune. There are many mills for grinding flour, built by the settlers of the colonies, and considerable trade is carried on in corn, oil, saffron, wine, and wood. There are eight fair days in the year.

The arrondissement has an area of 340 square miles, and comprehends 49 communes. It is subdivided into six cantons, or districts, as follows: Part of the Garonne. The population in 1821 was 62,489; in 1836 it was 62,735.

MOIVRE, DE. [De Moivre]

MOLA. There are two artists of this name, who were contemporaries, and both studied for a time under Alabano. Of these the more celebrated one, Pietro Francesco, was born at Colbre, in the Milanese territory, in 1621, and after receiving his first instructions in art from his father, who was both a painter and architect, he studied successively under Giuseppe, Alabano, and Guerino. He attained to great celebrity in colouring, and though his chief merit lay in landscapes, to which he chiefly applied himself, he also painted history exceptionally, and with much ability. His talents obtained for him the patronage of princes and nobles, and among others the Duke of Savoy, whose favouring caused him to be invited to France, and he was making preparations for proceeding thither at the time of his death, which happened at Rome in 1668. According to other notices of him, the dates both of his birth and death are from those above given; these being respectively 1609 and 1665; besides which, he is stated to have been born at Lugano.

GIANNATTISTA MOLA, who was not at all related to the preceding, but is said to have been of French extraction, was born in 1629, and died at Parma in the year 1681, and afterwards under Alabano, at Bologna. Like his namesake Pier Francesco, Gianbattista was an excellent landscape painter, and well skilled also in perspective, though in other respects his inferior. He died in 1661.

MOLASSES, the uncrystallized syrup produced in the manufacture of sugar, and which is suffered to drain from the cane into a cask, in which it is called the curing-house, before the sugar is sent away from the plantation. To facilitate the draining, the casks are ranged upright on a framework of open joists over the easterm; several holes of about an inch diameter are bored in the bottom of the casks; and before the molasses is put into the hogheads, or, as it is called, potted, an equal number of plantain-stalks, or sugar-canes from which the juice has been expressed, are placed in each cask, so that the ends of their stalks project through the holes. These stalks or canes must be of an equal length with the cask, through which, in consequence of the passageway of the greater part of the molasses: some will always remain in the hogheads, and, draining away by slow degrees, will in a great measure be lost during the voyage; but even after the arrival of the sugar in Europe a proportion of molasses, which is less or more according to the good or bad quality of the sugar, remains in the mass.

Nearly all the molasses made in the English sugar colonies, are, after the crystallisation of the sugar, washed out into the sea by distillation on the estates; but the price of that spirit having declined, and improvements having been made in the processes of refining sugar in Europe, whereby a large proportion of West India molasses has been rendered crystallizable, a considerable quantity of crude and coarse molasses of molasses is shipped for that purpose. The syrup, which ultimately remains in a liquid form after passing through the processes of a refining-house, whether the same are the produce of Muscovy or of Jamaica, are sometimes called molasses, but are more generally known as sugar cakes.

The quantity of West India molasses imported and taken for consumption, in each year from 1820 to 1835, has been as follows:

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<tr>
<th>Year</th>
<th>Imported</th>
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<td>1829</td>
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The consumption duty charged on molasses is nine shillings per cwt., or three-eighths of the rate charged on crystalline sugar.

MOLD. [ Flintshire.]

MOLDAVIA, a province of northern Turkey, situated between 45° 22' 30" N. lat. and 25° 30' E. long. It is bounded on the east by the Russian province of Bessarabia, which constituted a part of the principality previously to the peace of 1812, and from which it is separated by the river Pruth; on the south by the Danube and the Carpathians, and on the north by the Buckowine and a part of Galicia or Austrian Poland. Its greatest length from south to north is about 200 miles, its breadth about 120, and its area about 17,000 square miles. The Danube, which touches the small part of Moldavia, forms within the limits of the principality the rivers Steireh and Pruth. Branches of the Carpathians extend along the western frontier of Moldavia, and separate the principality from Transylvania. These mountains send out offsets into the interior of Moldavia, which divide up the province into the basin of the Sereth and Pruth, where they terminate in hills covered with vineyards. Moldavia is divided into Upper Moldavia, or Trans de Suss, which is subdivided into four counties, and Lower Moldavia, which is subdivided into nine districts. The climate of Moldavia is much colder in winter than might be expected in a latitude corresponding with the north of Italy: the rivers are generally frozen, and the ground covered with snow for a considerable time. The country is subject to earthquakes, but they are not very violent: the most remarkable was that which occurred on the night of the 3rd of February, 1821. The country possesses much mineral wealth, of which however little advantage has been taken, in consequence of the unsettled state in which the country has been for several centuries. There
is an abundance of rock-salt in the vicinity of the Carpathian mountains; there are also some mineral sources; and asphalt in the southern part of the province, and is the seat of Moldavia. A great quantity of saltpetre is also produced, chiefly in the northern part of the principality. The sand of the river Bistritza contains gold, but in a very small quantity. The soil is generally clayey, red and black, and, notwithstanding the very inferior state of agriculture, produces every kind of grain and vegetable in the greatest abundance. A great number of horses, cattle, and sheep are fed on the rich meadows which Moldavia contains, and the vast forests produce vast quantities of timber.

Jassy, or Iassy, the capital of Moldavia, is situated on the Bachiul, a small muddy stream which flows into the Pruth. It is in 47° 9' N. lat. and 27° 26' E. long. It is the residence of the voivode, and of the principal authorities of the province, and is the seat of the archbishop. The palace of the voivode is on a eminence on the southern side of the town, and is surrounded by an old slight wall, which is a sufficient defence against bands of robbers, but would be small protection from an enemy; this is however nearly all that remains of the former strong fortifications of the town, which were destroyed in 1788. It has been frequently taken by the Russians, but has always been restored on the cessation of hostilities.

The village space of the town is 536, under the houses being separated from each other by courts and gardens and plantations of trees. In 1723 it was almost entirely destroyed by fire; in 1772 it was desolated by the plague; in 1822 it was burnt by the Janissaries, when 4700 houses were burned, and in 1857 it was again conflagrated and reduced almost the whole town to a ruin. It now presents a melancholy aspect; instead of well-built houses, it consists chiefly of wooden buildings one story high, with wide spaces vacant or filled with ruins. The principal street, which is very wide, is obstructed with ruined houses on one side; the other streets are narrow and crooked; most of them are laid with rough planks of oak; in the rainy season they are covered with wet mud, and in summer with a thick dust, which is blown up in clouds. The present population of Jassy is probably not more than from 15,000 to 20,000. Before the great fires in 1827 its population was 40,000, and it had 43 churches and chapels, 26 convents, one Catholic and one Lutheran church, a hospital, a hazzar, three public baths, and a Wal- lachian printing-office, the only one in the province. There are not many manufactories, but a considerable commerce is carried on, especially during the fairs which are held there.

Galatz, or Galatz, in 43° 23' N. lat. and 28° 5' E. long., is situated on the Buzău, about one third of the distance between the junction of the Schiret and ten miles west of the junction of the Pruth with that river, and about eight miles north from Braïloch, which is the chief post of Wallachia. Galatz is an important place of export and import for the whole province, and is the chief medium of the commerce carried on between Germany and Constantinople. By a law of 1834 the privilege of a free port has been granted to Galatz; and a steam communication having recently been established between Vienna and Constantinople, it is likely to become a general mart for Austrian merchandise, which will be shipped thence to the Levant and the ports of the Black Sea. Galatz is for the most part better built than the other towns of Moldavia, having numerous houses of stone, several Greek churches, a convent, an hospital, and a large bazaar always well filled with merchandise, together with a great number of warehouses for grain and other produce; the streets however are narrow and dirty. Vessels of 300 tons burthen can enter the town. In 1811 the population of Galatz, of which 87 were Russian and 31 Ionian; the rest were Austrian, French, Sardinian, Tuscan, Neapolitan, and Servian. The population is about 12,000.

Fârășov lies on both sides of the Pruth, near the river, a small stream which joins the Pruth, between Moldavia and Wallachia, in 43° 41' N. lat. and 27° 10' E. long. It was formerly a large commercial town, but was almost destroyed in 1789, during the war between the Russians and the Turks. It was rebuilt in 1834, but not been much improved, but it is still a tolerable trade in hardware. It contains several Greek churches and a convent. The population is about 2000. It is about 45 miles west from Galatz.

The population of Moldavia, according to the census of 1833, amounted to 450,000. It consists chiefly of Wallachians, Jews, Armenians, and Greeks. The name by which the Moldavia is best known is that of Wallachia, from which it is separated only by a political boundary, having been originally the same country.

Moldavia has been subjected to great devastations by the several hordes which invaded the Byzantine empire, and the great number of its inhabitants, descended from the Roman settlers, retired to the west of the Carpathian mountains, to the present country of Hungary. About the middle of the thirteenth century a colony of the same inhabitants re-occurred in Moldavia, and, under a chieftain named Dumitru, it is called by the Turks and the natives Bogdania; whilst the name of Moldavia is derived from a river bearing a similar appellation. There must have been in the above-mentioned colony an admixture of Slavonians, as the name of the country is Slavonic in its etymology, and indeed the language of the inhabitants, who call themselves Romans, 'Roomoon,' consists of Latin with an admixture of Slavonic. Divine service is performed in the Slavonic tongue.

From that time the rulers of Moldavia, called voivodes (a Slavonic term which signifies military leader), were often subject to the kings of Hungary, but also frequently asserted their independence, until they submitted to the protection of the Austrians in 1775. In 1812 the Moldavians acted according to the advice of his father Stephen in order to secure by a voluntary submission privileges which it would have been impossible to obtain if the country had passed under the dominion of the Ottomans by conquest, as a condition of independence. They were able to obtain from the Turks via the same privileges that he had given to Wallachia, the substance of which was, protection to the principality, for which an annual tribute was paid. The voivodes were to be elected by the principal clergy and the boyars, or nobles, and the election must be confirmed by the sultan, who was not to interfere in the local administration of the principality, neither were Turks permitted to settle there. The voivodes had the power of life and death over their own subjects, and the sultan of Tartar, without being accountable to the Sublime Porte. No inhabitant of Moldavia was to be summoned to the Turkish government to Constantinople or any part of the Turkish dominions on any pretext whatever.

These conditions were maintained in the main points. Moldavia was however exposed to several wars which were carried on between Turkey and Poland, as the latter country had an old claim on the principality, which was finally abandoned by the peace of 1829, in which Russia took the chief part in the privilege of electing the voivodes, and nominated to that dignity the Greek prince of the Farar [Fanariotes]. The princes or voivodes of Moldavia, called also hospodars, governed with the assistance of a council, called a divan, composed of twelve members appointed by the prince every year, and which was the first council of the metropolitan, whose ecclesiastical dignity entitles him to a permanent seat. The laws were administered according to a code framed after that of Justinian. There were a great many offices, several of which were copied from those of the Greek empire. The national army was composed of about 6000 men.

The tribute paid to the Porte was not so oppressive as the monopoly of trade: several articles, as wheat, timber, and cattle, were exported to Constantinople and bought from the inhabitants at a fixed price which amounted to one-fourth of the current market-price. As the hospodars were obliged to give considerable presents to the Turkish officers, and as they also sought to enrich themselves, the country was often plundered and desolated in order to obtain a suspension of arms. Moldavia was occupied by the Russians in 1739, under field-marshall Munnich, but was evacuated by the peace of Belgrade. By the tenth article of the treaty of peace concluded between Turkey and Russia, at Koochook Karynardou, in 1774, Russia stipulated for several advantages in connection to Moldavia and Wallachia, and to herself for permission to interfere with the Porte in favour of the above-mentioned principalities. The fourth article of the treaty of Yassy, Jan
amusement. At this period he took the name of Molière.

The company was unsuccessful.

Here comes the period of eight years, and we find him in 1653 playing at Languedoc, whither he had been invited, at the head of a company, by the Prince de Conti, who appreciated his histrionic talents. In this company was Madeline Blake, whose daughter subsequently became the wife of Molière. The latter, after a visit to the company to Lyon, where, in 1653, he produced his first play, "L'Etourdi," with such success, that two other companies joined him. This piece is amusing from the variety of situations, and has the disadvantage of resembling; each other too closely. The portrait trait of Molière's character, his beginning of Molière's tendency to sketch character, though character is here subservient to incident. In 1654, having returned to Languedoc, he produced his second piece of "Le Dété Amoureux," which was likewise successful. The Prince de Conti was so pleased with his productions as to make him director of the entertainments which he gave in the province, and even to offer to him the place of secretary. Molière however refused this offer.

After remaining four or five years in Languedoc, the company quitted that province for Grenoble, where they played during the carnival. They then went to Rouen, and finally to Paris, where Molière was introduced to the king. Louis XIV. before the second company played the tragedy of "Nerome," in 1658, at a theatre erected for the purpose of playing at the old Louvre. Molière felt that in tragedy his company was inferior to that of the Hôtel de Bourgogne, and therefore, when the play was ended, he came forward and observed, "Les empres de cette maison ont renouvé la fameuse". He hoped that the king would allow them to play one of the little comic pieces which had been successful in the provinces. The king granted the request, and the piece, which was one of those early works of Molière which have not been played with success, the piece, which Molière wished the company to remain at Paris, gave them the title of "Troupe de Monsieur," and allowed them to play, alternately with the Italian comedians, at the theatre called "Petit Bourbon." In 1660 they removed to the Palais Royal.

In 1658 Molière's early pieces of 'L'Etourdi' and 'Le Dété Amoureux,' which had been acted with such success in the provinces, were played with great applause at Paris, and in 1659 was produced his celebrated "Précieuses Ridicules," which was so successful, that the prices of admission were trebled on the second day of performance, and the piece notwithstanding had a four months' run. With this comedy the fame of Molière may be said to begin; the mo- lière was such that it turned reader more than writer, not only in France, but also in Parisian public perceived that the author was a bold and strong proayer of prevailing characters and manners. It is written in prose, and the design is ridicule to those ladies, called "Précieuses," who indulged in an affected way of talking peculiar to the court. It was written at "Le Coq Imaginaire" with great success, though it was not so popular as its predecessors. It is ingeniously con- structed, but it is not so much an exhibition of character as "Précieuses," so much of its success lies in the different characters of the "bôrs" of the period, such as a man who talks of nothing but hunting, a composer, a carl-player, a duellist, and pass in quick succession, and present a most happy pantomimic picture of the times.

In 1663 appeared his "Le Bourgeois Gentilhomme," which was very great success in Paris, although the principal character, Agnes, is the original from which Wycherly has taken his Mrs. Pinchwife, in "The Country Wife," subsequently altered by Grrick to the 'Country Girl.' Molière was so indig- nant at the plagiarism of his piece, that he wrote another, called "Le Critique de l'Ecole des Femmes," in...
which he held up its opponents to public denunciation. One of the characters, a ridiculous marquis, is supposed to represent the Duc de Feuillade. This 'Critique,' which was played in 1663, was very successful. A little piece entitled 'L'Impromptu de Versailles' was produced the same year, which consists merely of a satirical conversation among the comedians. It is preceded by a commendation, or any recommendation, or a piece of thanks to the king, who had, in the year of its production, granted Molière a pension of a thousand livres. He was greatly esteemed at court, where he held the office which had been filled by his father; and the king is said on one occasion to have saluted him at the sight of some of his officers who treated him with haughty coldness.

Molière's happiness would have been greater had he not about this time married Armande Béjart, then about 17, whose youth and beauty dispelled all his moral agonies of jealousy. To relieve himself from domestic distress, he pursued his labours with additional ardour, and wrote 'Le Mariage Forcé,' and 'La Princesse d'Elide,' which were produced in 1664, and Le Féstin de Pierre,' the subject of whose plays was mere farce, which exhibits however Molière's aptitude to sketch character in the two little parts of the peripatetic and sceptical philosophers; the second is one of those heavy mixtures of serious comedy and ballet which, however effective they might have been in Molière's productions, do not appear to have been to the taste of the public. 'Les Petits Hommes,' however, enjoyed a reputation of its own, and the trouble of persuading them; and the third is an ill-constructed piece, with a spark of humour here and there, chiefly remarkable for being one of the numerous versions of the story of 'Don Juan,' which is the subject of Mozart's opera. Molière's plays were performed by the company of the Sire de Rochemont, who considered it impious. In 1665 the king engaged Molière's company for his own service, granting them a pension of 7000 livres, and they took the title of the 'Troupe du Roi.' A little piece, called 'L'Amour Mégot,' followed up this triumph in the medical profession, which Molière had incidentally commenced in the 'Féstin de Pierre.'

His excellent comedy 'Le Misanthrope' was produced in 1666, and was reckoned among his chef-d'œuvres. It abounds in characters, and it was not long before it found its way into the repertory of the theatre. In the same year appeared 'Le Ménage malgré lui,' a humorous attack on the physicians, well known to the English by Fielding's version, entitled 'The Mock Doctor.' With respect to the date of the ballet 'Le Tartuffe,' there is a little difficulty. In collections of Molière's works it is placed at some distance after the 'Misanthrope,' and is dated 1667; but some lines in the 'Misanthrope' appear to allude to a book which the bigots of the day, offended by the Tartuffe, wished to suppress. In order to punish his antagonist Molière had ample opportunities made to the king, that he ordered the piece to be withdrawn. The representations of Molière induced the king to revoke this order, but Molière did not consider it prudent to perform it at once. About the same period he produced three significant little pieces, 'Médecin malgré lui,' 'Pastorel Comique,' and 'Le Sicilien,' and in 1668 appeared his 'Amphitryon,' a clever version of the 'Amphitryon' of Plautus, altered by the addition of a woman to Socon, and the substitution of a prophecy of the birth of Hercules for the private negotiations of the Roman admiral. 'Le Misanthrope' was brought out in the same year, but played at first with little success, owing, it is said, to its having been written in prose, which the audience did not think calculated for pieces of this kind. It was a failure, and one of his handsome pieces, nothing can be better than the character of the miscreant (supposed to be imitated from the Euclio of Plautus' 'Aulularia'), we cannot refrain from admiration at the boundless ingenuity displayed by the author in placing in one of his characters a scene adapted to the little drama of Le Facheux. This is the prototype of those pieces where the greatest variety of characters is introduced in succession, 'L'Avaro' is on the other hand, the prototype of those which are chiefly occupied in the exhibition of one character in all its phases. The piece was less successful, and rendered Fielding as 'The Miser.' Having produced in the same year a successful piece, 'George

Dandin,' which is a droll little farce, Molière ventured on a second representation of 'Le Tartuffe,' to the great indignation of the bigots. The theatre was crowded to excess, and the piece was just about to begin, when a prohibitory order arrived from parties who held authority during the absence of the king, who was in Flanders. The actors, not having the king's permission to produce, returned the spectators their money, and extinguished the lights. Molière instantly despatched two of his actors to the king, to solicit his protection; and on their return with an order in their hand, the piece was played without interruption. Of the merit of the comedy 'The Hypocrite' is not so well known to the English public by the imitation called 'The Hypocrite.'

There is no doubt; but whether religious imposture is or is not a fit subject for ridicule on the stage, is a question we cannot answer without opening the door of public observation to the Sire de Porquegnac's 'farce representing the awkwardness of a pompous country-gentleman in a large metropolis, and containing an incidental satire against the physicans, was represented in 1669 with great success, and the famous 'Dampierre' interlude, piece,' Le Comptesse d'Escarnagau, and 'Les Fourberies de Scapin.'

In the year 1672 Molière became reconciled to his wife, with whom he had long been at variance, and at the same time quitted a milk diet, to which he had restricted himself on account of his consumption. The following year saw the ascertainment of his health, and he occurred at first not very great, the subject being rather dry and redolent for the public at large. Before the production of this piece he had assisted in composing a 'tragédie-ballet' on the subject of Cupid and Psyche, and had 'bought on Gore innumerable pieces,' and the following year, was equally fortunate.

This, although in five acts, as a farce of the most extravagant kind, and being, as it is called, a comédie-ballet, the author has allowed it at the close to run almost into a pantomime. In construction it is composed of three pieces, of which two are essentially ballet pieces, and the other represents pieces that go by the name of 'comédie-ballet;' so easy is it to avoid difficult unrollings by the introduction of dances. Several of the pieces named above belong to the class, although they have not been so specified.

In spite of all this, Molière's plays of the 1660s and 1670s are the most comic pieces, and illusions are perhaps more frequently made at the expense of any other play of Molière's. The pompous ignorance of the principal character and the pretensions of his pupils are humorous and realistic, yet sometimes laughable; but as far as construction goes, it is a mere succession of farceous incidents.

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strength lies in the delineation of character. His plots are often excessively inartificial and improbable, but in character he is almost unrivalled. He also enters deeply into the humour of a comic situation, though here it is rather difficult to measure his merits by a strict standard, as many of his most important situations are notoriously borrowed from the Italian comedies. On character therefore alone rest his unequivocal pretensions to fame, for even if the idea be borrowed from other writers, still the minute portrayal of the complex propositi and bearings, requires a master spirit, and if it be not borrowed, the execution must still be original. He has naturally often run into the failing, too common with those who make distinctive character their principal object, of degenerating into mere caricature or caricatured. [Ever so slight a disfigurement of the soul of a single passion or whim, the omission of the qualifying tints of real life necessarily throws out the single characteristic so prominently, that caricature almost necessarily arises. The personages of Theophrastus and La Bruyère become caricatures from their features taken abstractedly, instead of a mixture such as is observable in real life.

Besides his dramatic works, Molière translated nearly the whole of Lucrètius, but all his translation has been lost, except the portions upon the base, and these were destroyed. His works have been so frequently published, and can be so easily procured in every shape and size, that it is almost useless to point out any particular edition. A very good one, a new and perfect, was published at Paris in 1735, and the actors' names are printed after the dramatic pieces, and which thus shows that Molière always played himself the principal comic parts, and also forms a very agreeable illustration to the dramatic history of the times.

In the third edition recently published with wood-cuts by Jannot, MOLINA, LOUIS, born at Cuenca in Castile, entered the order of Jesuits in 1553. He studied at Coimbra, became a learned divine, and taught theology for twenty years in Salamanca. He died in that city on the 20th of July, 1600. He wrote commentaries upon Thomas Aquinas, and a treatise 'De Justitia et Jure,' but the work which has rendered his name famous is the head of a school of theology is his book 'De Concordia Gratiae et Libertatis,' published at Liébana in 1555, with an appendix in quarto published after. In this work Molina undertook the task of reconciling the freewill of man with the foreknowledge of God and predestination. He observed that the early fathers who had preceded the heresy of Pelagius had defined predestination as being the foreknowledge of God from all eternity of the use which each individual would make of his freewill; but St. Augustine, who had to oppose the Pelagians, who granted too much to freewill, spoke of predestination in a most arbitrary and restricted manner. He says, that man requires grace in order to do good, but that God never fails to grant this grace to those who seek it with fervour. He also asserts that man has it in his power to answer, or not, to the calling of grace. These views were adopted, enlarged, and commented upon by the Jesuits, and strongly opposed by the Dominicans, gave rise to the long disputes concerning grace and freewill. The partisans of Molina were called Molinists, and their antagonist Thomists, from Thomas Aquinas, the favourite divine of the Dominicans. Already in Molina's lifetime his opinions were stigmatised as favouring of Pelagianism. After numerous disputations, Pope Paul V., in 1669, forbade both Jesuits and Dominicans from picking up in such matters. Bishop of Ypres, wrote a book in which he discussed the question concerning grace after the manner of St. Augustine. His book was denounced by the Jesuits, and thus the dispute began afresh between the Molinists and the Jerusalemites. The Jesuits, in reply, in the book, 'La Improvisazione,' gives an account of the state of the controversy in his time. He says that 'the Jesuits pretend that there is a sufficient grace imparted unto all men, and subordinate to their freewill, which can render it active or inactive, while the Jansenists maintain that the only sufficient grace is that which is efficacious, that is to say, which determines the will to act effectively. The Jesuits support the sufficient grace, the Jansenists the efficacious grace. Molina must not be confounded with Michael Molina (Michael), a Spaniard of the seventeenth century, who was the founder of the society of piety and devotion called Quietism, of which Fénelon and Madame Guyon were distinguished supporters. [Fénélon.

MOLINISTS. [Molinists.]

MOLLEBART. [Bamberg Land.]

MOLLUSCA. [MALACOLOGY; CONCHOLOGY; CONCHYLOGIA, and various articles relating to this class of Invertebrate animals.

MOLOSSI, a people of ancient Epirus, who occupied the southern part of that country along the banks of the river Traciti, and extended to the shores of the Ambracian Gulf. Their king, Artabazus, was the subject of the Mollus, under their king Alexander, about 320 B.C., gained the preponderance over the rest of Epirus, which they maintained under his successors, of whom Pyrrhus was the most celebrated. His account of the war with Pyrrhus against the Romans, 278 B.C. in the battle of the Milutus, the Roman general, ravaged the country of the Molossi, as well as the rest of Epirus, and destroyed their towns. The effects of the devastation which he caused were still visible in the time of Strabo.

MOLOTHERY, Mr. Stewart's name for a genus of birds placed by him in the subfamily Icterinae, under the family Sturnidae, with the following

Generic Character. - Bill very short, thick, fleshy-like, conic; the culmen not flattened, but slightly arched; the nostrils close to the upper mandible; wings longish; pointed; the first quill longest. Tail slightly rounded. Middle toe as long as the tarsus; lateral toes of equal length; hind toe shorter than the tarsus. All the claws rather small; a small fleshy scale on each.
Thrush and Wilson's Thrush, are however also selected as places of deposit. From the varied and interesting accounts of this curious phenomenon we select that of Nuttall, whose personal observations we proceed to lay before the reader.

When the female is disposed to lay, she appears restless and dejected, and separates from the unregarding flock. Stealing through woods and thickets, she pries into the bushes and brambles for the nest that suits her, into which she darts in the absence of its owner, and in a few minutes is seen to rise on the wing, cheerful and relieved from the anxiety that oppressed her, and proceeds back to the flock she had so reluctantly forsaken. If the egg be deposited in the nest alone, it is uniformly forsaken; but if the nursing parent have any of her own, she immediately begins to sit. The Red-eyed Flycatcher, in whose beautiful basket-like nests I have observed these eggs, provokes a very affectionate and assiduous nurse to the uncouth foundling. In one of these, I found an egg of each bird, and the hen already sitting. I took her own egg and left the strange one; she soon returned, and, as if sensible of what had happened, looked with steadfast attention and shifted the egg about, then sat upon it, but soon moved off, again renewed her observation, and it was a considerable time before she seemed willing to take her seat; but at length I left her on the nest. Two or three days after, I found that she had relinquished her attention to the strange egg, and forsaken the premises. Another of these birds however forsook the nest on taking out the Cowbird's egg, although she had still two of her own left. The only example perhaps to the contrary of deserting the nest when solely occupied by the stray egg, is in the Blue-bird [Blue-Bird], who, attached strongly to the breeding-places, in which it often continues for several years, has been known to lay, though with apparent reluctance, after the deposit of the Cowbird's egg. My friend Mr. C. Pickering found two nests of the Blue-eyed Yellow Warbler, in which had been deposited an egg of a Cowbird previously to any of their own; and unable to eject it, they had buried it in the bottom of the nest, and built over it an additional story! I also saw, in the summer of 1830, a similar circumstance with the same bird, in which the Cowbird's egg, though incarcerated, was still visible on the upper edge, but could never have been hatched. At times, I think it probable that they lay in the nests of larger birds, who throw out the egg, or that they drop their eggs on the ground without obtaining a deposit, as I have found an egg of this kind thus exposed and broken. I have also remarked sometimes two of these eggs in the same nest, but in this case one of them is usually promptly discarded. The same author in 1831 saw a hen Red-eyed Flycatcher sitting on two eggs and one of the Cowbird, and he adds that this species, Pirocos Excellent, and (more lately) Pireosolea oleacea of Bonaparte, Muscicapola olivacea, Linn., appears to be its most usual nurse. He has known this Piroco to begin incubation with only an egg of each kind, whilst in other nests he has observed as many as three belonging to the Piroo, as well as that of the intruder; and he suggests that, from the large size of the egg, the nest probably immediately feels full to the incubating bird, so as to induce her to sit directly, when the larger egg, being brought nearer to the body of the nurse than her own, is first hatched, generally, as he believes on the 12th or 13th day. The legitimate eggs are hatched about a day later, are often stided by the superior size of the stranger, which is affectionately nursed by the poor duped of a dam, and when the young are dead, are conveyed to a distance by the parent and dropped; but they are never found immediately below the nest, as would be the case, if they were ejected by the young Cowbird, as is done by the young cuckoo. [CUCULINA, vol. viii., pp. 268-9.] Indeed, continues Mr. Nuttall, 'as far as I have had opportunity of observing, the foundling is always the best fed and brooded of his nurses, and he nearly absorbs their whole attention, and early displays his characteristic cunning and self-possession. When fully fledged, they quickly desert their foster-parent, and skulk about the woods, until at length they instinctively go company with those of the same species, and becoming more bold, are seen in parties of five or six in the fields and lanes gleaning their accustom existence. They still however appear shy and watchful, and seem too selfish to study anything more than their own security and advantage.' The Cowbird is but a poor songster. Its lut-
ing migrations are generally made in the night or in the grey of the morning.

Geographical Distribution.—Besides the localities noted above, this species is also found in Mexico; but, according to Andubon, it is rare and a visitor only in Louisiana. The Prince of Musignano, in his Geographical and Comparative List, gives America generally as its locality.

Mr. Darwin (Journal and Remarks) states that another species (Le Trougade commun of Azara), of a purple-black colour, with a metallic lustre, feeds on the plain near Marandono in large flocks, mingled with other birds. Several he says, may often be seen standing on the back of a cow or horse. While perched on a hedge, and plunging themselves in the sun, they sometimes attempt to sing or rather to hiss: 'the noise is very peculiar; it resembles that of birds like a cuckoo, deposits its eggs in other birds' nests.' He states that this bird, like the cuckoo, deposits its eggs in other birds' nests. 'I was several times told by the country people that there was some bird with this habit; and my assistant in collecting, who is a very accurate person, found a host of the sparrow of the country (a Zonitrichia) with one egg in it larger than the others, and of a different colour and shape.' The egg is now in the museum of the Zoological Society of London.

MOLSHEIM [RHIN BAS.]
MOLTON, SOUTH. (DEVONSHIRE.)
MOLUCCA ISLES, constitute a part of the Indian
Archipelago, and are situated between 5° N. lat. and 9° S. lat., and between 123° and 131° E. long., being dispersed over the sea, which extends from the eastern coast of Celebes to the western coast of Papua or New Guinea. In a more limited sense, the term Moluccas is applied to the islands from which spices are obtained, as Ambonya, Banda, Ceram, &c. Others apply the term only to the northern group, or the islands lying in the Molucca Strait, between Celebes and Gilolo, including the last-mentioned island.

Soil and Surface.—We are very imperfectly acquainted with the natural features of these islands, as the Dutch, who have settlements on several of them, and who keep their sovereigns in a considerable degree of dependence, have been very anxious to exclude all other Europeans, and have succeeded in doing so, except for a few years during the wars between 1798 and 1814. It is however known that nearly all these islands are mountainous, and that the summits of the mountains reach to a height of 7000 or 8000 feet. The rocks of which they are composed seem to be mostly of a volcanic nature, and there are at least eight volcanoes still in action. These volcanoes seem to be the southern extremity of that extensive series which runs from Sumatra down the north-east coast of the Malay Peninsula, and continues southwards through the Kurules, Japan, and the Philippines, enclosing the eastern shores of Asia, as it were, with a volcanic barrier. On the other hand, it may be said that the most southern of these volcanoes, Mount Leiden, on the eastern coast of the Moluccas, joyful a barrier, which skirts Eastern Asia on the south, and proceeds from the Moluccas westward through the Lesser Sundas Islands and Java, where it terminates. Like other volcanic countries, the surface of all these islands is very rugged and broken, and contains a great number of harbours for every kind of vessel. Except where the declivity is too steep for vegetation, the mountains are covered with forest, which forms a great variety of trees, many of which are useful as timber or for cabinet-work.

Climate.—As none of these islands are more than 9 degrees from the equator, the climate is hot all the year round, but the heat is not excessive, on account of their comparatively small size and the uninterrupted continuance of the monsoons for at least ten months of the year. The seasons are dependent on these periodical winds. The rainy season begins in February or March, with the north-east monsoon; for while the north-east monsoon and fair weather prevail in the Chinese Sea and in the sea between Sumatra and the eastern coasts of Africa, the wind blows from north-west and west in the sea surrounding the Moluccas. This state of things continues at least of every year, and is the case in the Sunda Islands during the north-east monsoon, take advantage of this circumstance. Instead of passing through the Sunda Straits and struggling against the wind and current in the Chinese Sea, they sail on the winds of Java, and pass through one of the straits which divide the Lesser Sunda Islands from one another to the sea of Banda, or that portion of the Indian Ocean which extends from the islands of Celebes and Flores eastward to New Guinea. They pass between Ceram and Gilolo to Ceric, and sail along the eastern side of the Philip- pages, which grow wild in the forests and are also planted. Fish, wild deer, and hogs are also articles of food. The productions raised for exportation are limited to the clove and nutmeg trees, which are the only two articles that the Moluccas send to Europe. In addition to these articles they send to the markets of China, the table herbs, sea- lugs, and shark-fins. A small quantity of gold is also exported, as well as birds of paradise. These beautiful birds visit these islands at certain seasons of the year, coming from New Guinea and the Anilao Islands. They are a native breed. The number of articles of export would be much increased if these islands were open to all European vessels, as the fertility of the soil and the climate favour the growth of all tropical products. Even at present they furnish more than nine-tenths of the world's supply of mother-of-pearl, honey, bee's-wax, ambergis, sandal-wood, and various kinds of beautiful wood for cabinet furniture. While the English were in possession of the Moluccas, they obtained from them cordage, cables, and timber.

Inhabitants.—These islands, like nearly all those which constitute the Indian Archipelago, are inhabited by two races, the Malays and the Papuas. The Malays are in possession of the coasts, where they cultivate the ground or tend the submergents by fishing. The Papuas are Mohammedans, and among them are several shepherds, or persons who are the converts of Mohammed. They seem to have adopted that religion shortly before the arrival of the Portuguese in 1510. Their language contains a great number of foreign words, and it is said that the Papuas have numerous religious ceremonies. Their language has been an original tongue. The Papuas have been extirpated on the smaller islands, but they still maintain their ground in the mountainous districts of the larger islands. They seem to belong to the same race which inhabits the country between the Aral Sea and the Andaman Islands, but they do not exhibit that ferocity of character by which the inhabitants of the two last-mentioned countries are distinguished. They are described as submissive to the rule of the Sultan.

Diocesis. —The number of islands probably amounts to some hundreds, of which however many are small and uninhabited. They may be divided into three groups: the Gilolo group, or Proper Moluccas; the Ceram group; and the Ternate Laut group. The Gilolo group comprises the northern islands and extends from 2° S. lat. to 3° N. lat., and contains the islands of Gilolo, Morly, Mandioy, Batchan, Oby, and Mysole, with numerous smaller islands lying between and about them, among which the islands of Ternate and Tidor are the most important. In figure Gilolo resembles Celebes, being composed of four long peninsulas, which are connected near 10° N. lat. Its greatest length from south to north may be 220 or 230 miles, and its surface, on a rough estimate, about 8000 square miles. It is known that the western peninsulars and the northern and eastern peninsulars rise into high mountains, whilst the southern attain only a moderate elevation. It seems to have a considerable population. The northern peninsulars, to the east of a line drawn from the southern to the sultan of Tidor; but the two peninsulars projecting towards the east have their own sovereigns. Morly rises with a gentle ascent to a considerable height, and is said to have good harbours. Mandioy and Batchan are separated from one another by a narrow strait, which affords good anchorage. They are of moderate elevation, and are governed by their own sovereign, to whom also the island of Oby belongs. The last-mentioned island is very little known. The islands of Ternate and Tidor are small, and are separated from each other by a strait. The western group is of moderate size, and is very fertile, and they are very populous. Their sultans possess the greater part of Gilolo, and also several districts on the eastern coast of Celebes. To this group belong two smaller groups lying farther north and west. The island of Salibabo is divided into three islands of some extent, Touluer, Salibabo, and Kabruang, and the last-mentioned island is a large island and numerous smaller islands. Sangir Island is about 70 miles long; through its central part runs a ridge of high mountains, which terminates on the north in a volcano, which in 1711 made an eruption accompanied by a dreadful earthquake. The Ceram group occupies the middle between 5° and 8° S. lat., and comprehends the two large islands of Ceram.
and Booro, and among the smaller ones, which lie to the south of them, the Sipipo, on Ambonya and Banda Islands. The latter is a coffee-producing island, and is said to produce 6000 lbs. of coffee per annum, which is exported to the East Indies. It was named in honor of a Dutch trader who lived there, and died in 1865.

**History.**—When the Portuguese were exploring the eastern seaboard of Africa in the sixteenth century, they arrived at the Moluccas (Spice Islands) in 1500, and it has been said that the name Moluccas is derived from the word 'Molucco' which means 'a house to which no one can return'. The inhabitants of the islands are divided into two main groups: the Malacca and the Batak. The Malacca are the original inhabitants of the islands, while the Batak are a group of Chinese who migrated to the islands in the sixteenth century. The Malacca are the more powerful of the two groups, and they have been ruled by the Chinese for over 500 years.

The islands were first discovered by the Dutch in 1600, and they quickly became a source of wealth for the Dutch East India Company. The Company controlled the trade in spices, particularly nutmeg, mace, and cloves, which were in high demand in Europe and Asia.

**Economy.**—The economy of the Moluccas is based on the cultivation of spices, particularly nutmeg, mace, and cloves. These spices are grown on the islands and are exported to the Netherlands and other parts of the world. The islands are also rich in minerals, particularly gold, silver, and tin. The islands have a tropical climate, which is ideal for the cultivation of spices.

**Population.**—The population of the Moluccas is estimated to be around 60,000 people. The islands are divided into two main groups: the Malacca and the Batak. The Malacca are the original inhabitants of the islands, while the Batak are a group of Chinese who migrated to the islands in the sixteenth century. The Malacca are the more powerful of the two groups, and they have been ruled by the Chinese for over 500 years.

**Culture.**—The culture of the Moluccas is unique and rich. The islands have a history of trade and commerce, which has influenced their culture and religion. The islands have a rich tradition of music and dance, and the islands are also known for their delicious food.

**Environment.**—The Moluccas have a tropical climate, which is ideal for the cultivation of spices. The islands have a rich biodiversity, with many rare and endangered species.

**Conclusion.**—The Moluccas are a beautiful and unique place, with a rich history and culture. The islands are a great destination for those interested in exploring the world of spices.
New Contrivance for adapting a Telescope to an Horizontal Dial, 4to., Dublin, 1868; 'Journal of the Three Months' Campaign of His Majesty in Ireland, with a Diary of the Siege of Limerick,' 4to., 1869; 'The Case of Ireland being bound by Acts of Parliament stated,' 8vo., Dublin, 1868-1706-70-76.

(Moment of the Family and Descendants of Sir Thomas Molyneux, Knt., Evesham, 1820, 4to; Hutton's Mathematics, 4to.)

MOMBAÇA, or MOMBA, is a town situated on that part of the eastern coast of Africa which is called the coast of Zanguebar, and in 4° 4'S. lat. and 39° 28'E. long. It is built on the eastern side of an island, which occupies the greater part of the town, and may assert to the windward. The island is three miles long by two broad, the two straits which divide it from the continent are hardly half a mile across. The eastern strait constitutes the harbour of the town, which is one of the most perfect in the world. It is a good anchorage ground at the entrance, sheltered by an extensive reef on each side; the shore is so steep and rocky, that in many places wharfs are unnecessary. The cliffs surrounding the island are of madrepore, and rise with a steep ascent, so that the town does not look like a huge castle encircled by a moat, over which there is only a single ford at its north-western extremity, and even that is dangerous. The castle, built by the Portuguese in 1636, on a rock of moderate elevation, lies to the south of the town. The town is not large, but exhibits great activity of motion, and is entirely inferior in size to either of the other towns, which occupies the most northern portion of it. The former, which was once inhabited by the Portuguese, is now inhabited by the Arabs. Some free coloured people and slaves constitute the population of the Black Town. The population of the town is about 3000 or 4000. Though the Arab inhabitants of this town are poor, they cause their children to be instructed with great care in reading and writing, and in order that they may not, at the same time, lose their instinctive and religious sentences from the Koran are used as the tasks. The commerce is not considerable, and is mostly in the hands of some Banyans from Hindustan, who, during the favourable monsoon, send a small quantity of ivory and other articles of value, in which they obtain in return East India and English manufactures.

Vasco de Gama visited this port in 1498, and was well received, but nearly fall a sacrifice to the treachery of the inhabitants. It was afterwards taken and burnt by Fran·cisco de Almeida in 1506, but he did not keep possession of it. Twenty-three years later it was taken by Nuno da Cunha, after a stout resistance from the inhabitants, and was again reduced to ashes. It seems, that from that time the Portuguese remained in possession of it for nearly two centuries; when they lost it, it was in possession of the Imam of Muskat. It appears however that he lost it soon afterwards by a rebellion of the inhabitants. In 1824 the Imam sent a force against it. The Arabs, and adjacent tribes, insisted that they could not resist the Imam, put themselves under the protection of the British, and hoisted the English flag, by which means they have preserved their independence. The Arabs are governed by a sheik, whose office is properly hereditary, but the course of descent has often been interrupted by intrigues and civil dissension.

(Owen's Narrative of Voyages to explore the Shores of Africa, Arabia, and Madagascar.)

MOMENT OF INERTIA. [Moment, or Moment of Inertia.]

MOMENTUM, or MOMENT. This word has been used in various senses. It simply means a motion, the word "moment," from "momentum," being found in several ancient authors. Momentum was originally a rapid motion, whence it came to be a short time; but moment, which, in common life, means an indivisible instant of time. Thus an effect which requires a single second to produce it would not be properly momentary. But the word "momentum" has been used in the same & allied sense, but with special reference to the time of its operation, and is used to signify the amount of an effect of motion, actual or conceivable. Thus we have one in the article VIRTUAL VELOCITIES, another in LEVER, a third in MOMENTUM OF INERTIA, and a fourth, the most common of all, with which our text is occupied, to adopt the Latin term "momentum.

The English synonym of this fourth sense is "quantity of motion," and we may observe that in this sense it is most usual, in our language, to adopt the Latin term "momentum," instead of the abbreviation "moment." It is impossible to give an actual definition of momentum, in simple terms; but the conception is obtained by those who observe that the effects produced by motion (both notions are necessary) may be augmented either by giving the same motion to more matter, or greater motion to the same matter. Imagine a BALLISTIC PENDULUM, and suppose a bullet of two pounds weight to strike it with a velocity of 100 feet per second. If this bullet oscillates, when it may, it may be produced by a bullet of one pound weight striking with a velocity of 200 feet. The same effect is produced in both cases, though by different quantities of matter and different velocities, there is something which we may observe that is the same in the case of the smaller bullet with the larger velocity. This is the momentum, or quantity of motion, a notion of a cause which is asserted to be the same when the effects are the same. This definition would be useless except in connection with principles observed or deduced, by which it is applied. That there is a reality in connection with it, all who know the difference between light and heavy, as these words are frequently used, are well aware. A heavy blow, for instance, does not mean a blow with a heavy body; thus the fall of a poker may give a light blow, while that of a book of one-tenth part of its weight may give a heavy one. The difference in these cases is that of momentum.

The velocity remaining the same, the momentum or quantity of motion of a body in motion is increased or diminished in proportion to the velocity communicated. But the peculiar proposition on which the utility of the term and the notion depends is this, that in all mechanical effects produced by mechanical motions of any kind, the mass remaining the same, the momentum increases proportionally to the velocity communicated. But the peculiar proposition on which the utility of the term and the notion depends is this, that in all mechanical effects produced by mechanical motions of any kind, the velocity remains the same, the momentum increases proportionally to the velocity communicated. But the peculiar proposition on which the utility of the term and the notion depends is this, that in all mechanical effects produced by mechanical motions of any kind, the velocity remains the same, the momentums by a proportionate increase of the velocity: that is, M being the number of units of mass, and V of velocity, as long as the product of M and V remains the same, the effect produced is the same. Thus in the preceding instance M x V = 2 x 100 in the first case, and 1 x 200 in the second. And as long as M x V = 200, the same effect will be produced, if the pendulum be supposed to be heavy that the addition of M to its mass is not worth considering.

The measure of the moment is called the moment of momentum, and is generally called the momentum itself. Here (as in Mass) tacit reference is made to a unit of momentum: the equation

Momentum of M with velocity V = M x V

implies that a unit of momentum is that produced by a unit of mass moving with a unit of velocity. But the mass of a moving unit of momentum may be considered as having the momentum a, the equation should be

Momentum of M with velocity V = a x M x V.

In vol. x. p. 323 when reference is made to this article, for momentum or moving force read momentum or quantity of motion.

MOMENTUM, or MOMENT OF INERTIA. Let us conceive a system of bodies possessing weight, and immovably attached to a fixed axis, round which the whole may be turn. It is known from experience, as well as deductive from the laws of motion, that the nearer the bodies are placed to the axis, the more rotatory motion may be communicated by a given force. The moment of inertia is a much given to a system mechanical function of a system and of their positions with respect to the axis, on the magnitude of which the rotatory motion produced by a given pressure, acting for a given time, depends. This function is the same as the moment of inertia of a rigid body, taken about an axis through its centre of mass, and if dm be one of the elements of the mass, at a distance r from the axis, the moment of inertia is then f r² dm, the integration being made throughout the whole extent of the solid.

Let A be the axis, and let a pressure be communicated to the system at the point P, and such as would, were a single mass placed in P to revolve with a velocity v, the system of that single mass only to revolve with a velocity v, being at the distance a from the axis. The moment of this velocity is Pr. Let the system of m, m', m'', &c. be the masses of material points situated at the distances r, r', r'', &c. from the axis, the moment of inertia being taken about the axis through the centre of mass, and if dm be one of the elements of the mass, at a distance r from the axis, the moment of inertia is then f r² dm, the integration being made throughout the whole extent of the solid. And as long a M x V = 200, the same effect will be produced, if the pendulum be supposed heavy that the addition of M to its mass is not worth considering.

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quence of this pressure, begin to revolve with an angular velocity $\theta$ (measured in theoretical units [ANGLE]). The consequence is, that $m$, $m_1$, and $m_2$ begin to revolve with velocities $r \cdot \theta$, $r_1 \cdot \theta$, and $r_2 \cdot \theta$, and moments $mr_0$, $m_1r_1$, and $m_2r_2$. Now if pressures which would just prevent this motion in the same time as the applied pressure generated it were

applied in the opposite direction, the three pressures so applied would counterbalance the pressure at $P$. But [Pressure] the pressures which in the same time produce motions are to one another as the moments produced, so that if $a \cdot P_0$ represent the pressure at $P$, those applied in the contrary direction at $m$, and units at $m_1$, and $m_2$, but the first acts perpendicularly at the extremity of the arm $m$, the others at the arms $r$, $r_1$, and $r_2$. Hence $amr \cdot r + amr_1 \cdot r_1 + amr_2 \cdot r_2$ must be the same as $a \cdot x^2$, and hence it is evident that

$$\theta = \frac{mr + m_1r_1 + m_2r_2}{x^2}$$

the denominator of which is what has been called the moment of inertia of the system. Hence it follows that the communication of a given pressure at a given distance from the axis of rotation will cause an angular velocity which is inversely as the moment of inertia: if the masses or their distances were increased in such a way as to double the moment of inertia, the angular velocity produced by a given pressure would be only the half of what it would have been before the change.

The moment of inertia may be represented by $\Sigma m^2$ (sum of all the terms of the form $m^2$) and the whole mass by $\Sigma m$. Let $k$ be such a distance that if the whole mass were concentrated at that distance, the moment of inertia would not be altered: that is, let $k \Sigma x^2 = k \Sigma m^2$. Then $k$ is what was called the radius of gyration. [GYRATION.]

The property which is most important in the actual determination of moments of inertia by the integral calculus is one in virtue of which the moment may be found with respect to any axis when it is known with respect to a parallel axis passing through the centre of gravity. Let $PQ$ be an axis passing through $G$ the centre of gravity, and let $A$ be another axis parallel to $PQ$ and distant from it by $r$ or $k$. Then, whatever the moment of inertia may be when $PQ$ is the axis, that with respect to $A$ is found by adding the moment of inertia of the whole system concentrated in $G$, or $\Sigma m x^2$. That is

$$M \cdot I. (axis \ A \ B) = M \cdot I. (axis \ P \ Q) + Mass \ of \ system \ x \ G \ P.$$
law, had embraced Christianity in great numbers very soon after its promulgation. The sactive life of the Essenes, says Gibbon, 'their fasts and excommuniactions, the community of goods, the love of celibacy, their zeal for martyrdom, and the warmth, though not the purity, of their faith, already offered a very lively image of the primitive discipline.'

[Dean's Note: Fall, 1838.]  Two or three various accounts, after admission, that Bussagens, in his 'Histoire des Juifs,' has demonstrated, in spite of Eusebius and a crowd of modern Catholics, that the Therapeutics were neither Christians nor monks; he adds, 'we are therefore called from the most obscure forms, preserved their manners, adopted some new articles of faith, and gradually became the fathers of the Egyptian ascetics.' Afterward (chap. 37), he seems distinctly to represent the ascetics as the fathers of the monks. 'They,' he says, 'seriously denounced the business and the pleasures of the age; abstained the use of wine, of flesh, and of marriage; chastised their body, mortified their affections, and embraced a life of misery as the price of eternal happiness.

In the reign of Constantine (A.D. 306-337) the ascetics fled from a profane and degenerate world to perpetuate solitude or religious society. The first Christians of Jerusalem, they resided the use or property of their temporal possessions; established regular communities of the same sex and a similar disposition; and assumed the names ofAnthony, Paul, and the like. Thus, in the profession of the world, the latter his illustrator—'buxus vitae sectae Paulus, illuminator etiam Antonius.' (Hieron. Ep. 22, ad Eustoch., c. 16.) Paul is designated the Thebais. An account of St. Anthony, as he is styled, and of the progress of the monasticism which he was the earliest promoter of, from A.D. 251 to A.D. 356, has already been given under his name (ii. 96). We shall only note here that the first monastic community is said to have been established at Phaum, near Aphrodisias, in the Thebais of Egypt, about the year 290, probably by a company of monks who had originally driven Anthony, Paul, and others to the deserts. Strictly speaking however this and other monasteries appear to have been founded rather by Anthony's disciples, and in obedience to the spirit which had everywhere spread, than directly under his own superintendence.

Of these disciples, the most eminent was Pachomius: if the Decian persecution and Anthony gave rise to monasticism, 'the age of peace' of Constantine offered the peaceful times of Constantine. The ancient writer of the 'Acta Pachomii' makes Anthony acknowledge himself in the following speech to one of the disciples of Pachomius:—'When I first became a monk, there were only two of us; I was a stranger and a hermit, where one man was obliged to take care of another, but every one of the antient monks, when the persecution was ended, exercised a monastic life by himself in private. But afterwards your father Pachomius, by the help of God, effected this of Gibbon has in a few words well sketched the first stage of the progress of the new institution:—The prolific colonies of monks multiplied with rapid increase on the sands of Libya, upon the rocks of Thibais, and in the cities of the Nile. To the south of Alexandria the mountaineers of the neighborhood are fraternities of monks and thousand anachoretas; and the traveller may still investigate the ruins of fifty monasteries which were planted in that barren soil by the disciples of Anthony. In the Upper Thebais the ancient island of Thamusis was occupied by a band of monks, 5000 in number, and the adjacent villages contained and the monasteries of his brethren. That holy abbot successively founded nine monasteries of men and one of women, and the festival of Easter sometimes collected fifty thousand religious persons, who followed his ascetic discipline and executed the orders of the church. It is not improbable that Pachomius, who survived till the middle of the fourth century, had received his rule by special revelation from an angel. The other most celebrated early propagators of monachism are Hilary, another disciple of Anthony, who carried the system into Syria, about A.D. 326; St. Athanasius, bishop of Alexandria, who brought it to Rome, A.D. 340 [ATHANASIUS]; Eustathius, bishop of Sebastia, or Sebastia, by whom it was soon after extended to Armenia and Paphlagonia; St. Basil, who established it in the province of Moesia, A.D. 360 [BASIL]; and St. Martin, bishop of Tours, by whom it was, about A.D. 370, introduced into Gaul, whence it is generally supposed to have been imparted to the British Isles by Pelagius, about the beginning of the fifth century.

At first all the communities of monks followed the rule of Pachomius, and therefore they were not distinguished into monks and nuns; but after a few years, at the time of the death of the monks of Mount Scevthos, of Tabenne, of Nitris, of Canopus, &c. But besides the monks that lived in communities, and who are called in ecclesiastical language, 'Erasmus orientalis, or sometimes Synodites, and by the Egyptians, according to St. Jerome, 'Sacchoes,' there were for some ages divers other species, which the ecclesiastical antiquarians have taken much pains to distinguish. Some lived, although in the same district of the wilderness, yet all in separate caves or cells, and without any association or common government, in which case the collection of hermitages was called a Laura, according to Epiphanius. Another sort are described by Cassian under the name of Sabatantae, and were called by the Egyptians Remboth, according to St. Jerome, who says that they lived two or three together, without any rule, but each after his own fashion, taking up their abode for the most part in cities and fortified stations (castellita). In other respects he gives a very bad account of them: although they were wont to lead a retired life, he excludes the practice of fasting, yet at other times they would indulge to as much excess in riotous festivity; all things about them were affected; loose clothes (manicas), pulled-out boots (caliga, anenticas), coarse clothes, frequent sighing, muchvariation of the young women, and so forth. In short, concludes Jerome, they are the pests and bane of the church. Another species of these early monks or solitaries were those called Stylistes, that is, pillar saints (from stasis, a pillar). St. boy was a Syrian shepherd, who, having, in A.D. 468, when he was only thirteen years old, left his flocks and joined a monastic community, afterwards withdrew himself to a mountain about 30 or 40 miles east from Antioch, and there, confining himself to a monastic life, he continued to live for seven years, and proceeded at last to take up his residence on the top of a pillar, which was gradually raised from the height of nine to that of sixty feet. Simon Stylites died A.D. 451, after having, it is said, existed for thirty years at the last-mentioned elevation in the air. Habit and exercise, however, so much en- strueted him to maintain his dangerous situation without fear or giddiness, and successively to assume the different postures of devotion. He sometimes prayed in an erect attitude, with his hands open towards heaven; but his most familiar practice was that of bending his meagre skeleton from the forehead to the feet; and a curious spectator, after numbering twelve hundred and forty-four repetitions, at length desisted from the endless account. St. Simon however lived in the air so long that his name proved very contagious; among the few pillar saints, besides the contriver of the practice, whose names are recorded, the most famous are, another Simon, styled the Younger, who is said to have occupied his airy watch-tower for sixty-eight years, and one Alypius, who left the bishopric of Adrianople for this other sort of episcopacy, and, it is affirmed, kept singing psalms and hymns between heaven and earth, at all hours of the day and night, for the whole space of three years and ten, while a choir of of the Alexandrian church and a thousand virgins, seated on the ground below, lent the aid of their voices to swell the strain. About the beginning, or, as others think, about the middle, of the fifth century, a pious individual, named Alexander, set up a pillar in the fashion of mosaic at Constantinople, the professors of which received the name of Acometes (in Greek, Ἀκομέτης), that is, the watchers, or the sleepless, from their practice of dividing themselves into three classes, which took the performance of divine service in unbroken succession; Alexander placed two and a half times a year out the entire round of the twenty-four hours. The Acometes, sometimes called Studitae, from Studius, a Roman nobleman, who became one of their society, and built a famous monastery for them, which, after him, was named Acohmetis, and the name was afterwards transferred to numerous at Constantinople. Alongside of the Stylistes may be placed another description of fantastic enthusiasts, the Borei, or Grazing Monks, whose whim it was to live like the beasts of the field, inhabiting no houses, and eating neither bread nor flesh, but roaming about upon the mountains.
as they continued without ceasing to make the wilderness resound with their hymns and psalms, and when it was time to eat, every man, taking his knife in his hand, and proceeding to cut or dig for himself a dinner of herbs from the ground. Still another sort of old monks is made mention of under the name of Cypriot, the Cypriotes. Monks, of which the epithet may be transferred to Mount Athos, St. Benedict describes these as rambling about continually from province to province, getting themselves well entertained for three or four days at every cell they came to, mere slaves to their glutinous appetites, and in all things worse even than the Saracens.

From this sketch it is evident that the institution of monachism had arrived at a state of very considerable corruption both in the Eastern and the Western churches, when St. Augustine was sent to reform it, in the latter, in the early part of the sixth century. [Benedict, Saint, and Benedictine Order, vol. iv., p. 213.] It does not appear however that Benedict, in drawing up what is called his Regula Monachorum, or Rule, had any intention of founding a new order of monks, but rather that the principal monasteries that were founded throughout Europe were of the Benedictine order. The Lorschians, Cistercians, Grandmontines, Provamontes, Cluniacents, &c., were all only so many varieties of Benedictines. The hierarchy of the abbots of St. Gall, which was divided into twenty-three subdivisions of this order in all, distinguished only by such local or other specific appellations, and by some slight differences of habit and discipline. The innovations introduced by Benedict were of course longest in penetration into the corners of the East, and perhaps in no other part of Europe were they so long in being generally received as in the British Isles. Bede and other contemporaries discuss the more remarkable abbeys, and perhaps in no other part of Europe were they so long in being generally received as in the British Isles. Bede and other contemporaries discuss the more remarkable abbeys, and perhaps in no other part of Europe were they so long in being generally received as in the British Isles. Bede and other contemporaries discuss the more remarkable abbeys, and perhaps in no other part of Europe were they so long in being generally received as in the British Isles. Bede and other contemporaries discuss the more remarkable abbeys, and perhaps in no other part of Europe were they so long in being generally received as in the British Isles.

Meanwhile in the Eastern church also monasteries and nunneries had been made the subject of legal regulation by a conjunctura studii (Nov., 53), when the archbishop of Constantinople and ecumenical patriarch, in the consilium of Belisarius, A.D. 535. By these enactments no monastery could be founded except the ground was first consecrated by the bishop within whose diocese it was, which he had to perform within a year from his consecration. Persons were not permitted to assume the monastic habit till after a three years' probation, and the abbots (συγγελοι) were required, during this time, to examine well into their life, conversation, and fitness for the monastic profession. On being approved, the candidates assumed the dress and tonsure. Both free persons and slaves were alike admitted into monasteries, and were received on the same footing in all respects. A master might claim and take away his slave within the three years, if he could prove private accusations against him for theft or any other offence; but not otherwise. Thus the monasteries became a place of refuge to slaves who had severe masters. The law ordained that the monks should eat together, and should all sleep in a common chamber. The monastic profession was in favour of those called anchorites and hesychasts (συγγελοι και συγγελωτα), who led a contemplative life in solitude (such is the phrase), and were allowed to have separate cells. It seems that a man could leave his monastery whenever he liked, although it was an act of extreme mortification; but as all the property which he had not disposed of before entering the monastery (subject to some provisions for his wife or children, if he had any) became the property of the monastery on his entering it, if he chose to leave it he must take with him an equivalent share of his property. Celibacy and chastity were required of the monks, though at this time marriage was permitted to certain clerical persons, as singers and readers. Further regulations on the life of monks and nuns are contained in the 134th novel. A monk was prohibited from entering a female monastery (for one word only is used in these laws for male and female convents), and a nun was prohibited from entering a male monastery, under any pretext whatever. Other regulations to the same general effect of ensuring purity and the due observance of all monastic duties are prescribed by the legislation.

In the earliest age of the monastic system, the monks were left at liberty as to many things which were afterwards made the subject of strict regulation by the laws of the church. For example, one of his epistles, speaks of bishops that fast, and monks that eat and drink; bishops that drink no wine, and monks that do; bishops that are not married, and many monks that are the fathers of children. Originally, too, monks and nuns and all other clerics that segregated from the world more and more the common practice for them to take holy orders, it was not till the year 1311 that it was made obligatory upon them to do so by Pope Clement V. Nor was any vow of celibacy or any other particular vow formally required of ecclesiastics in the East, although at a later period some points came at length to be regulated by the Imperial law.

The word nun, in Greek Νοέια, in Latin Novit, is said to be of Egyptian origin, and to signify a virgin. Another account is, that the original meaning of the Latin was novi, or new. The nuns of the Benedictine order were divided into three classes, the religious, of whom the name was nona, and nunnas for a grandmother and grandmother. Cypriotes and Tertullians, in the latter part of the third century, make mention of virgins dedicating themselves to Christ. Such a practice was indeed a natural mode of sacrificing, which had been familiar to the religious sects of these ecclesiastical or canonical virgins, as they were called, appear already to have formed themselves into communities, similar to those of the monks; but others endeavoured to give a more religious discipline to the female monachism however, from the rudeness and laxity of the first form of the institution, to the strict regularity which characterised its maturity, moved on side by side with that of male monachism.

Monasteries are called by the Greek fathers not only Μοναστήρια and Monav, but also sometimes συγνυανακριβον, a holy places; ηγεμονανακριβον, the residences of the abbots, δικαιος οικονομος, or chiefs; μητροπολες, inclosures; and συγνυανακριβον, places of reflection or meditation, that being one of the principal objects of the Egyptians. The law of the monastic orders embraces an account of the different sorts of religious houses, and of their government, see the articles Abbess, Abbey, Abbot, and Convent.

The habits and other peculiarities of the principal orders of monks and nuns are explained under the name of each. It is only necessary to notice here, that the three vows of chastity, poverty, and obedience are taken by all monks and nuns at their admission. All, both male and female, likewise receive the tonsure, like all the ecclesiastics of the Roman church. In all the orders the candidate for admission must first undergo a novitiate, which varies from one to three years. The age at which novices may make profession differs in different countries; but the rule laid down by the council of Trent only requires that the party, whether male or female, must be in its 14th year to allow of admission. It was added, that in the modern constitution of monachism, the vows and status of a professed person, as indeed of all ecclesiastics, are by the law of the Roman church for life and inchoate.

The greatest revolution by which the history of monachism has been marked since the establishment of the rule of St. Benedict, was the rise, in the beginning of the thirteenth century, of the Mendicant Friars. Of these an account has already been given in the last study. The friars, or mendicants, particularly will be found under the names of the several orders.

The general dissolution of monastic establishments was one of the first consequences of the Reformation in our own times, and was of course, in all the Protestant churches. There are however a few Protestant monastic establishments in some parts of Germany. Even in Catholic countries, especially in Germany and France, the number of these establishments has been greatly reduced.
within the last fifty or sixty years, and the wealth and power of those of them that still exist most materially curtailed. The Roman Catholic church, thus little valued by the emperor Joseph II.; those of France were all swept away at the commencement of the Revolution; but some of them have been set up again, though with diminished splendour, since the restoration of the Bourbons. Since the reparation of the penal laws, several Roman Catholic parishes have been erected in England and Scotland, as well as in Ireland. Monks and nuns of all descriptions still swarm in Italy, and in the countries of South America, lately subject to the Spanish and Portuguese crowns; in Spain was composed 369,902 English, and about 3,500 in number, within these few years. Even in modern times we still hear occasionally of the institution of a new order of monks. One, called the Congregation of the Blessed Virgin Mary, was established by the late Pope L. X. in 1825. But the most important new order of monks, founded in the Roman Catholic church since the first outbreak of the Reformation, is that of the Jesuits; for an account of which see vol. viii. p. 110. [MONK.]

The most important works on the subject of monasticism are the following:—


MONACO, the Principality of, a small state in the west, enclosed for commercial purposes by the small towns of Monaco and Mentone, and the village of Roquebrune, with a small territory about five miles in length along the coast, between Nizza and Ventimiglia, and extends inland about a mile and a half. It is triangular in shape, the base facing the southern slope of the Maritime Alps, which here approach close to the sea. The town of Monaco is built on a steep naked rock rising above the sea-coast, is fortified, and has about 1000 inhabitants, and a harbour for small vessels. Mentone, farther to the east, lies on the sea-shore in a narrow strip of fertile land, sheltered by the mountains from the north winds, and planted with olive and lemon trees; it has a warm southern climate, and carries on some trade by sea. Mentone has about 4000 inhabitants, and a handsome church, with a campanile which has been used by the Pope as a castle. It has been in possession of the Genoese family of Grimaldi, under the protection of France and of the Genoese republic. The actual prince of Monaco, Onorato V., is a peer of France, and generally lives at Paris, but he acknowledges the king of France as sovereign of the state, and has a Sardinian garrison. He has a palace at Monaco and a handsome villa near Mentone. He draws from his little state a revenue of about 300,000 francs, 12,000L. sterling, of which less than one-half supplies the charges of the administration, among the rest is the use of the prince. [Bertolotti, Viaggio nella Liguria Marittima.]

The name of Monaco is derived from a temple dedicated to Hercules Monocesus, that is 'solitary,' which stood on the rock where the town now stands. It is about four miles from the sea, and at a distance of 200 stadia from Antipolis, the modern Autiules.

MONAGHAN, a county in the province of Ulster in Ireland, bounded on the north by the county of Tyrone, from which, toward the north-east, it is separated by the river Blackwater, on the east by the county of Fermanagh, from which, in one part, it is separated by the river Fane; on the south-east by the county of Louth, on the south by that of Meath, and on the south-west by that of Cavan, from all three of which it is partly or entirely separated by the river Fane. It extends entirely to the north-west by the county of Fermanagh. The form of the county is that of an irregular quadrangle. Its greatest dimensions are the diagonals of the quadrangle: one from north by west to south-east, 73 miles; the other from north-east to south-west, 37 miles; the river Fane, 32 miles. The area of the county was given by Dr. Beaufort (Memoir of a Map of Ireland), in 1792, at 450 square English miles, or 288,000 English acres, and by Mr. Wakeman, in his (Account of Ireland, Statistical and Political), at 599 square miles. In the Population Returns for 1831 the area is given, from the best authorities extant, at 377,472 acres; in the Map of Ireland published by the Society for the Diffusion of Useful Knowledge, at 313,658.2 English acres. Blacker's Topographical Dictionary of Ireland, from the Ordnance Survey, at 327,046 statute acres, of which 925 are unimproved mountain and bog, 6167 under water, and the rest cultivated land. The county is one of the most densely peopled in Ireland. Its ancient capital is Armagh, and its chief towns are Dublin, Arnaugh, and Down; by the census of 1831 there were 195,536 inhabitants. Monaghan, the assize-town, is situated in the northern part of the county, 68 English miles in a straight line north-north-west of Dublin, or 76 miles by the mail-road through Drogheda, Carrickmacross, and Castle Blayney, in 54° 15' lat. and 6° 57' or 58° W. long.

Surface.—The whole county is hilly, but the hills seem to be scattered in an irregular manner, without forming continuous ridges or chains. [Wakeman.] The principal heights are, Slieve Beagh or Slieve Beach Mountains, in the north, which define in that part the basin of the Blackwater, and those in the east, which rise about the sources of the Boyne, and are connected with the Mountains of Armagh. (Beaufort's Map.) Mullly Ash hill in the north of the county is 1035 feet high. The Slieve Beagh Mountains form an uninteresting waste along the boundary of this county and Tyrone, and are sterile without being picturesque.

Geological Character.—The geological character of the county is a small district, extending to Kingscourt in the county of Cavan, occupied by the new red-sandstone or red marl. This formation contains a valuable deposit of gypsum, in which however no workings have yet been commenced. There are also some trading and working seams of coal in the red-marls district on the east is a small coal-field. Though many trials have been made to obtain coal, none has yet been found of sufficient value to defray the expense of working; but a coal is found near the town of Cavan, in the eastern part of the county. This district is 12 inches, another of 12 inches, and several of inferior thickness have been discovered. The coal-field rests on a small tract of carboniferous limestone, which crops out from beneath it on every side (except where the coal and red-marl districts are contiguous), and is itself insulated in the transition district of the east of Ulster. Carboniferous limestone appears again in that part of the county which lies north-west of a line drawn through Monaghan and Clones. The Slieve Beagh or Slieve Beach Mountains in this part are composed of red sandstone and red marl, with the Carlow sandstone. These rocks were long considered to belong to the true coal formation; and sanguine but fallacious hopes were long entertained of the discovery of workable beds of coal. This part of the county comprehends in the red-sandstone district of the catchment of the Liffey. The yellow sandstone and sandstone conglomerate, which form the lowest members of the limestone series, appear in some places along the northern border.

The rest of the county is occupied by the rocks of the transition formation, which cover an extensive district in the east of Ulster and north of Leinster. These transition rocks consist of grauwacke slate, felsite clay-slate, felsite slate, and chlorite slate, with hornblende slate, schistose marble, argillaceous rock, carbonatic calcareous formation, and crystalline formations, granite, &c., come in contact or approach near each other. Escars, or eskers, which are low steep ridges of alluvial matter, usually composed of clay and limestone gravel, are found in several parts of the county. Those of the Glis district, at the head of Portlaw, are composed entirely of jasper, quartz, agates, and argillaceous sand. (Irish Railway Commissioners' Second Report; Lewis, Top. Dict.)

Limestone of great variety and excellent quality is quarried; also fine marble, and valuable freestone for building. A fine white sandstone, dug in the Slieve Beagh Mountains, is extensively used for architectural purposes. Ironstone is found, but of inferior quality, and several quarries of slates at Maghastone and Maghastone Slating work, and considerable works were erected for smelting it, but they were afterwards abandoned. Some potters' clay is found, and brick earth in nearly all parts of the county. (Lewis, Top. Dict.)
Hydrography and Communications.—The northern part of the county belongs to the basin of the Blackwater, the southern to the basin of the Fane, and the Clyde, and the western to the basin of the Erne. The Blackwater has about 10 or 12 miles of its course along the north-eastern boundary, and several streams which rise in the Slieve Beagh Mountains fall into it in this part. The Fane rises not far from Castle Blayney, and flows south-east, partly upon and partly within the border of the county, for 12 or 15 miles, before it enters the county of Louth, through which it flows into the Irish Sea. The Clyde rises in the south part of the county, and has a course parallel to the Fane. A considerable part of the latter stream is navigable, and has about 13 miles of its course along the southern boundary of the county. The Finn is the most important of the streams which flow into the Erne; it rises in the Slieve Beagh Mountains, and has about 20 miles of its course in this county. None of these rivers are navigable. There is one navigable canal, now in progress, the Ulster Canal, which is to unite Lough Neagh with Lough Erne. It commences in the river Blackwater at Charlemont, and crosses the county in a south-west direction near Monaghan and Clones. Its whole length, when finished, will be about 46 miles, of which about 20 will be in this county.

There are several lakes, but all of them small. The principal is Muckno Lough, near Castle Blayney, in the eastern part of the county, and Inner Lough, on the south-west border, near Rockcorry. Muckno or Barrac Lough is of very irregular form, about 3 miles long from north-west to south-east, and in some parts about a mile wide. It consists of the water of many small streams. The Fane runs through it. Lough Inner is about 3 miles long from east to west, exceedingly narrow throughout and of very irregular form. Lough Emoy, near Emoyela, and Glas Lough, near the town of Glaslough, in the northern part of the county, are of the same kind. Other small lakes may be mentioned, the Newbliss, and Lough Long, near the village of Drum, in the western parts; the White Lough and Crof Lough, near Ballybay, in the central parts; Lough Egish, or Egish, Lough Araghon, and Lough Ross, on the southern border; and Ballyhoe (through which the Lagan runs), on the southern border of the county, and Lough Ross, on the eastern border, are next in size to Muckno and Inner.

The principal road is the mail-road from Dublin to Londonderry, which enters the county on the south-east side by two branches, and runs north-north-west through Carrickmacross (at or near which town the branches unite), Castle Blayney, Monaghan, and Emoyela, into the county of Tyrone. All the mail coaches and mail-roads run from Carrickmacross by Ballybay, and rejoins the main line at Monaghan. Other roads lead from Carrickmacross to Dundalk, from Castle Blayney to Newry and to Armagh, and from Monaghan to Armagh, and by Clones to Cavan. A new road from Navan (Mayoode) to Coothatt (Cavan), passes through Clones on the western side of the county, and joins the Londonderry mail-road at Omagh and Tyrone. The principal traffic is from the port of Dundalk (Louth), on the one hand, to Carrickmacross, and on the other hand to Sligo and Cootehill in the county of Cavan; and on the other hand, to Castle Blayney and Monaghan: from the port of Newry (Down), on the one hand, by Castle Blayney, to Ballybay and Newbliss in this county, and to Ballybay, and Clones in the county of Cavan; and on the other hand, by Newtown Hamilton (Armagh) to Monaghan: and from the port of Belfast (Antrim), by Armagh, to Monaghan, Clones, and Newbliss. The portion of road most frequented by travellers is that from Newry to Dundalk, via Cavan, from Dublin, Dundalk, and Newry, converging to Monaghan.

Soil; Agriculture; Condition of the People.—The soil of the county varies much, and the variation is partly dependent on account of the surface; the low lands being generally sandy and rocky, especially in the north-western parts near the Slieve Beagh Mountains. The central district, comprehending the baronies of Monaghan, Cremore, and Dartree or Darty, are more fertile than any other part of the county; although the southern extremity considerably yields in this respect. The eastern side has a soil naturally wet, but capable of great improvement by manuring. (Lawis: Top. Dict.)

The following particulars from the 'Reports of the Commissions for inquiring into the State of the Poor in Ireland' (Parliamentary Papers for 1836, vol. xxii.) have reference chiefly to the barony of Monaghan, but may be probably extended, without much variation, to the county in general.

The soil of the barony is mostly a good loam, over a firm subsoil of clay mixed with lime, gravel, or sand. In the elevated parts the soil is moor or peaty, with the sub-soil frequently clayey. Lime, dung, clay, ashes, and tar, are used for manure; lime is dug near Monaghan and Glaslough (barony of Trough): marling is little practised.

While the soil is common, though very injurious in spots: the barony of Monaghan is altogether a tillage district, except some of the land on which some young cattle are kept: there is no grazing land in the district capable of fattening cattle. Sheep are scarce and rare that the assistant commissioners did not see one in the barony, except in gentlemen's demesnes. It is too small to admit of keeping them with advantage, and the number has been gradually declining. The average size of farms is 8 to 10 acres; a few farmers, and but a few, in the barony held over 50 and not exceeding 80 acres. The only product held above 80 acres is potatoes, which are the only products held above 80 acres. The only product held above 80 acres is potatoes, which are the only products held above 80 acres.

Almost the whole county belongs to absentee owners, and the estates are consequently managed by agents. Farms are not commonly held by lease, and tenantry at will is becoming more common; where leases are granted, they are commonly for one life or for 21 years, formerly they were limited to 21 years or less. Leases of 21 years are very rare. The rent of tillage land ranges from 25s. to 32s. 6d. per Irish acre (121 Irish = 196 English acres) and in some instances it is as high as 40s.

A farm in Monaghan is potatoes, wheat or barley, oats (sown with clover), clover, then potatoes again; another not usual rotation is, potatoes, flax, wheat or barley, oats with clover. The wheat grown is generally red wheat, and it is of inferior quality, this is partly attributed to it being grown on the sod, or on a naked fallow; partly to the weeds which are allowed to grow up with it; and partly to the want of proper mechanisms for winnowing and screening it. It is not uncommon to thresh in the field, and winnow it in the open air by masses of dry straw. A very large part of the potatoes are cut in the bulk: the peasantry keep little of their own grain, some cannot even get the seed. Flax is grown to a great extent in the county, and is most valuable as a source both of industry and profit, but it is not equal in quality to that of those grown in the counties bordering on the north.

Clove and vetches are grown in abundance, but few turnips or mangel wuzel. Green crops, especially clover, have been increasingly raised of late years. The potato crop is very uncertain, but the ground is commonly prepared for it by burning it for manure; the kind of potato cultivated for the peasantry are 'caps,' which will grow on inferior ground and yield a plentiful return. There are several orchards; the farmers do not consider them profitable.

From the want of good pasture, no cattle are fattened except a few on the demesnes of the gentry. The cattle of the district are chiefly of the native Irish breed, of a reddish colour with a streak of white along the back. They are of a small size and are usually fed from Connaught potatoes, and are never grazed on the mountains. Many of them are housed in winter, but those of the poorer farmers get little hay, only straw, and the run of the stubble-ground. The breed of cattle has been much improved; the Devon, Dumm, and Hereford meet with great popularity. The breed of sheep has been much improved; the Lincoln, Cheviot, and Corriedale are raised in the county. The native breed has increased to several instances with the imported stock. The price of cattle is declining.

The quantity of butter made has much increased from the increased intercourse with England; the supply at Monaghan has trebled of late years. It is chiefly taken to market there, but some of it is sent to Newry. It is considered to be injured in the making by the smoke of
cabinets, but increased pains have been taken with it, and it has been much improved. There is no cheese made.

The usual fences are loose stone walls, clay ditches, and sometimes hedges of hawthorns and whins. There is much ground wasted in orchards and hedgerows.

The population of the county has been stated to be very dense; the number of labourers has increased, and the decline of the linen manufacture, which once furnished them with employment, left the great majority with little other work than that which is employed on the small spot of land which they occupy (for the con-acre system is generally prevalent), or such occasional occupation as they may receive. The daily wages of agricultural labourers are estimated, to the best of our knowledge, at 10d. for Saturday, 12d. for Sunday, 1s. 6d. for the morning of the week. In the wettest condition they commonly marry early, and without making any provision. They usually pay their rent in work done for the farmer under whom they hold their con- acre and cabbin. The common employment for labourers' wives or children, except that the farm overseer may be trified by spinning, if they can spare the time, or a very few keep poultry; and the latter get a day's work now and then at weeding or looking after the cattle, for which they get about 3d. a day. Girls go to school for 1s. 6d. a week, for learning to read. The common food of the labourers is potatoes, which they prefer as constant food to bread or meal. They get a little milk or buttermilk, but very rarely. 'We think as much of a drink of buttermilk,' said a poor woman to the Commissioner, 'as you think of a blackberry.' The whole of the cabins is sea-level, sometimes of one room, it may be of 12 feet square and of 7 or 8 feet high, sometimes of two. The floor is the bare ground, usually dug up and trampled to make it harder; and sometimes, but not often, lime and sand are thrown over it. The cabins are thatched with straw, and mostly have chimneys built with sticks and clay, with perhaps an old firkin stuck up as a chimney-pot. The windows are about a foot square, rarely glazed; the doors and shutters usually have iron hinges, latches, locks, &c. The cattle are without privies, but some have wretched little places for keeping a pig. They are inferior to those in the counties of Armagh and Down. The common fuel is peat or turf, which is used by all classes of the community; if they have not sufficient turf, they make up the deficiency with bushes and bales of hay.

The peasantry are wretchedly off for clothing. Many of them and their children are obliged to stay away from prayers for want of clothes; they borrow from each other, and go on in the same way.

Few of the women make their own clothes, but since the failure of employment at spinning, they are becoming more skilful with the needle. There are few cottages which do not contain some sort of bedstead, but this frequently contains beds of straw, or mattresses of straw, or, at least, some straw is shaken down for a portion of them. Pawning appears to be on the increase, and the people are becoming used to it. 'At first, some years ago,' said a witness to the Commissioners, 'we used to go in the dusk to the pawnbroker's, but now I would not go with it. The women all the people on the market-cross saw me. They know it is mighty pressure makes us do it.' Drunkenness has much increased. Retail spirit-shops have been multiplied, and there are a number of religious houses, unlicensed spirit-shops, which, being in remote places and under no control of the Government, are of great immorality. Almost all the cases which come before the magistrates arise out of drunken squabbles; and young people steal flax or potatoes or meat from their parents or neighbours, and submit to it. The intoxicating liquor in almost exclusive use is whiskey; beer is very little used. The tradesmen about the town, and the farmers who attend the markets, are the chief drunkards; the extreme poverty of the labourers prevents them from doing worse.

Emigration has been considerable during the last few years, principally to the United States of America and to the Canadas. A very few persons have gone to Van Diemen's Land or New South Wales. Many farmers have sold their produce at auction, and have abandoned their farms; but the emigrants have chiefly been persons of a station in life above that of common labourers, and have emigrated at their own expense. Several of them have been Protestants, and persons of good character and enterprising spirit.

Divisions, Towns, &c.—The county of Monaghan is divided into five baronies, which, with their situation and population, are as follows:

<table>
<thead>
<tr>
<th>Town</th>
<th>Central or Eastern Boundary</th>
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<tr>
<td>Cremorne</td>
<td>Central and E.</td>
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<tr>
<td>Dartry or Dartry</td>
<td>Central and W.</td>
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<tr>
<td>Farney</td>
<td>Central</td>
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<tr>
<td>Monaghan</td>
<td>Central</td>
</tr>
<tr>
<td>Trough</td>
<td>N.</td>
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It contains the corporate, assize, and market town of Monaghan, formerly a parliamentary borough; the market and post towns of Carrickmacross, Castle Blayney, Ballybay, Clones, and Newbliss; and the post towns of Emaville and Glaslough. The principal villages are Ballytrain, Smithborough, Tydavnet, Scarvan, Scotstown, Scobo, Ute, Rockcrory, and Magheracloone.

Monaghan is on the mail-road from Dublin to Londonerry: the distance from Dublin has been already given.

The antiquity of the town is evidenced in several terms in the charter to consist of 'the town of Monaghan,' that is, as far as the mere buildings are understood to have extended at the date of the Charter (A.D. 1615); but there existed streets extending in every direction about three-quarters of a mile, and not in a town proper, 'the Corporation,' and divided into ten parts or 'townlands.' (Report of Commissioners of Municipal Boundaries.)

The town itself consists of an irregular assemblage of streets, the three principal of which are named after the streets. There is a square called the Square, the south-east side of the town called Shamble-square. The town contained, in 1831, 540 houses, inhabited by 690 families, forming a population of 3,458 persons: there were 12 inhabited houses and 82 uninhabited. In the Report of the Commissioners of Irish Poor, the number of houses is given at about 900 (Answers of Rev. John Caulfield to Queries for Parishes in large Towns, Third Report, Appendix C, part 1), of which about 376 were good houses, 300 middling, and the rest mere cabins. The difference in the number of houses in the two statements is owing probably to the larger space included by Mr. Caulfield under the term 'town.'

The population had however much increased in the interval, chiefly from the unwillingness of landlords to allow cottiers on their estates. There is also a market-house and a linen-hall. Some antient walls, near the Diamond-square, are said to be the relics of an old monastery built for conventual Franciscans on the site of a former conventual house from one or other of which establishments the town (and from it the county) took the name of Monaghan or Muineich, 'the monks' town.' There is also an earthen mound marking the site of a castle or fort erected here early in the seventeenth century, by Sir Edward Blayney, who had the military command of the country.

Monaghan has no manufacture: its principal trade is in the agricultural produce of the surrounding districts, which is brought to market here; and in linen, for which it is a considerable mart. The market-days are Monday for linen and for pigs, of which great numbers are slaughtered and sent to Belfast to be cured for exportation; Tuesday for corn, except oats, for which there is a market on Wednesday; and Saturday for oats and potatoes. The corn and potato markets are held in Diamond-square; the meat market in Shanrory; and a large and well-arranged live-yarn, butter, and provisions of all kinds are sold. There is a fair on the first Monday in each month. The Ulster canal,
when completed, will pass close to the town. The poor in-
habitants are engaged in occasional labour about the town,
but wages are very low, and the earnings of a labourer, if
considered at the average annual amount only 6s. 8d. per
year. The condition of the poor has been deteriorating for
the last fifteen years: they subsist on potatoes, with
sometimes a little milk. The tradesmen are better fed. There is a
savings bank, to which the principal contributors are farmers,
and traders.

The corporation was created by a charter of 11 James I.
(a.d. 1613), and consists of a provost, twelve free burgesses,
and an inductive number of freemen. The borough sent two
members to parliament, and in the reign of Queen Anne
Lord Rossmore, the patron, received, 15,000l. as a com-
penation on its disfranchisement. The borough court of record
has long fallen into disuse. The quarter-sessions for the
division and the assizes for the county are held here; but
there are petty sessions held by the county magistrates
every week. The town is watched and lighted; and is the chief
station of the county constabulary. The living is a rectory
and vicarage, in the diocese of Clogher; the tithes com-
position rent is assessed at 533l. 16s. 11d. per annum,
and is a glebe of 38 statute acres, valued at 11s. 4d. per annum,
and a neat glebe-house. The Catholics form about two-
thirds of the population. There are ten public schools,
with about 1400 children; and seven private schools, in which
are about 300 children. There is an almshouse for ten
poor with an annual income of 80l., and a mendicant
society, each founded and endowed by the relief of the poor.

Carrickmacross is in the barony of Farney, in the north
part of the county, 51 miles from Dublin on the London-
derry mail-road. It consists of one principal street along
which are a great number of small and substantial houses,
leading to the market-place. The number of houses in the
town, in 1831, was 624 inhabited (by 555 families), 34 uninhabited,
and 4 building; the population was 2979, one-fourth agricultural: the rest
of the parish of Carrickmacross contained 1771 houses, in-
habited by 1777 persons; and 968 inhabited houses, and
2295 inhabited houses, and 12,600 inhabitants. Many of
the houses are of respectable appearance. There is a
church, a neat but small stone building, with a tower and
spire; a Catholic chapel, and a Presbyterian meeting-house.
There is a fair on Monday, and a market every day, and parts of
the parish. Malting, brewing, and distilling are carried on
in the town; coarse hats, soap, and candles are manufactu-
red; and a considerable retail business is done. There are
corn-markets on Wednesday and Saturday, and a general
market on Monday, at which many pigs are sold. There
are quarries of freestone and limestone in the parish, and
several lime-kilns near the town. A portion of the county
constabulary is stationed here; there is a bridewell, a
disability society, and a branch of the National Schools. Two
schools, one for boys and one for girls, connected with the Board
of National Education, and nine other schools, in which the
children are taught gratuitously; in these schools from
1400 to 1500 children are instructed. There are besides a number of
public institutions for the benefits and happiness of the children
on the roll of the two national schools amounting, by Mr.
Carlile's statement in the Report of the Irish Education
Board, July, 1837, to 538 boys and girls. There is a dis-
penary. The living is a vicarage, the gross yearly revenues
of which are 646l. 3s. 6d. composition for tithe; and 222l.
estimated value of the glebe, which comprehends above 181
statute acres. There is a glebe-house. The inhabitants are
almost entirely Catholics.

Castle Blayney is in Muckno parish, in the barony of
Cromore, miles from Dublin on the Londonderry mail-
road. The town lies near the western shore of Lough
Muckno, and conspicuous in 1831, 307 houses, inhabited
by 350 families, 2 houses building, and 32 unoccupied: the
population was 1955, and is about one-fourth agricultural.
The rest of the parish contained 1470 houses, inhabited by 1495
families, 3 houses building, and 89 uninhabited; with a
population of 8778: the total population of the parish
was 9716. The town derived its origin and name from a fort
built by the Danes, by order of the Earl of Dunlewy; and
consists of three streets meeting in the market-
place, in which is a good market-house. Many of the houses
are built of stone, and are of respectable appearance. The
parish church of Muckno, capable of holding 350 persons,
is at Castle Blayney, and there is a Catholic chapel. The
linen manufacture was flourishing here formerly. There
is a market on Wednesday for yarn and flax, and a fair once
a month for live stock; there are markets for corn and but-ter on Tuesday and Friday. Sessions for the division are
held here in a neat sessions-house once a quarter; and pre-
vent sessions every fortnight; and a body of the county con-
stable is stationed here. There is a small bridewell.

The mansion and demesne of Castle Blayney, the seat of
Lord Blayney, are near the town. There are a parochial school
and a girls' school, supported by Lady Blayney. Besides:
The Catholic chapel at Castle Blayney, there is another at
Grimstown, and at different places in the parish there are
four meeting-houses for Presbyterians and one for
Methodists. The Catholics form half the population, and the Pres-
byterians above a third. The living of Muckno is a rectory
and vicarage, the gross yearly value of the glebe is
272l. 4s. 4d. of which arises from tithe composition, the rest
from a glebe of more than 32 statute acres. There is a
glebe-house.

Ballinamuck or Ballibay, is in Creemore barony, 64 miles
from Dublin, on a road branching from the Londonderry
mail-road at Carrickmacross, and rejoining it at Monaghan.
The town comprehended in 1831, 382 houses, inhabited by
354 families; and 19 houses uninhabited: the population
was 2080, and is about one-third agricultural. There are
market-house, a tolerably large church, a Catholic
chapel-of-ease, and a handsome Presbyterian meeting-house.
The linen manufacture is carried on, and there are markets
on Saturday for butter and flax, and on Tuesday and Friday
for corn. There are two public houses, six schools, one
a market-house, a tolerably large church, a Catholic
chapel-of-ease, and a handsome Presbyterian meeting-
house. The linen manufacture is carried on, and there are
markets on Saturday for butter and flax, and on Tuesday
and Friday for corn. There are two public houses, six
schools, one a dispensary, four public schools, with about
260 children, a parts of the parish. Malting, brewing,
and distilling are carried on in the town; coarse hats, soap,
and candles are manufactured; and a considerable retail
business is done. There are corn-markets on Wednesday and
Saturday, and a general market on Monday, at which many
pigs are sold. There are quarries of freestone and limestone
in the parish, and several lime-kilns near the town. A portion of the
county constabulary is stationed here; there are a bridewell,
a disability society, and a branch of the National Schools. Two
schools, one for boys and one for girls, connected with the Board
of National Education, and nine other schools, in which the
children are taught gratuitously; in these schools from
1400 to 1500 children are instructed. There are besides a number of
public institutions for the benefits and happiness of the children
on the roll of the two national schools amounting, by Mr.
Carlile's statement in the Report of the Irish Education
Board, July, 1837, to 538 boys and girls. There is a dis-
penary. The living is a vicarage, the gross yearly revenues
of which are 646l. 3s. 6d. composition for tithe; and 222l.
estimated value of the glebe, which comprehends above 181
statute acres. There is a glebe-house. The inhabitants are
almost entirely Catholics.

Clones is in the barony of Darten, in the western part
of the county, 79 miles from Dublin through Navan (Meath)
and Kingscourt (Corked) to Toll (Carlow). The town con-
husted in 1831, 386 houses, inhabited by 435 families;
forming a population of 2831: there were 39 houses unoccupied
and 4 building. The rest of the parish, which extends into
Monaghan barony, and into the barony of Clinkeny in the
county of Sligo, contains 1672 houses, inhabited by
3934 families, forming a population of 1922, or with the
town 22,203. Clones was, in antient times, nearly sur-
rounded by water, and an abbey was founded early in the
sixth century: from these circumstances the place obtained
its name from the Gaelic word monks, the inhabitants are
ruled over by an Archdeacon; the town has been by
corruption, has been formed, first Clonish or Clonawa,
and more recently Clones. The abbey continued till the
dissolution under Henry VIII.: there are still some re-
 mains of the antient monastic buildings. The more modern
houses in the town are slated; but the older ones are re-
covered with thatch. The church was rebuilt in 1824, and
is capable of holding 700 persons. There are a large Catholic
chapel and a Wesleyan Methodist meeting-house. The
market-place is of triangular form, and has in it a market-
house, a dispensary, and an antient steeple. There is a
brewery in the town; and in other parts of the parish are
extensive iron-works for the manufacture of agricultural
implements, and several flour-mills. Limestone and good
clays are the principal minerals. A market is held weekly on Thursday for yarn and line, and once in two
monthly fairs, one in the town for pigs and live stock, and
one at Rosaleen, in that part of the parish which is
in the county of Fermanagh. Petty sessions are held every
fortnight, and a monthly fair is held in the town for the recovery
of small debts: a portion of the county constabulary is
stationed in the town.

Beside the places of worship mentioned above, there are
in the parish two chapels of ease, one a Roman Catholic
chapel, one Presbyterian meeting-house, and one Wes-
leyan Methodist meeting-house. There are a number of
schools in the parish, aided, if not wholly supported, by
subscription, and affording instruction to about 1900 children.
Some of them are in connection with the National Board. Nearly 300 children are under instruction in private schools. There is a dispensary. The living is a rectory and vicarage, of the gross yearly value of 2000l. 6s. 8d., of which 950l. arises from tithe composition, and the rest from a glebe of about 20 acres. The glebe is partly inclosed and houses are roofed with the Romish church the parish is divided into two districts, Clones East and Clones West; each part has two chapels. Near the ruins of the abbey is one of the ancient round towers. The internal diameter is 10 feet; and there are resting places for the roosts of five foliage. It is about 4 feet away from the ground; and at the top of the tower are large embrasures. There is another round tower in the parish.

Newbils is in Killkee parish, in the barony of Dartree, about two miles from Clones. It is a small place, containing in 1831 only 85 houses, inhabited by 105 families, making up a population of 497; there were 9 houses unoccupied, and 1 building. The number of houses in the rest of the parish, which extends into the barony of Monaghan, was 1393, inhabited by 1388 families, making up a population of 7764; or, with the town, of 8261. The town consists of a single street of good width: the houses are of respectable appearance. The parish church of Killkee is nearly midway between Newbils and Clones; but there is a neat Presbyterian meeting-house, which is 12 miles from the town.

There is a market-house: the market is on Saturday, chiefly for pigs and stack; and there is a monthly fair, chiefly for pigs and live stock. There are in the town a dispensary and a school with 70 pupils. From 400l. to 400l. are paid for the clergymen. There are in other parts of the parish a Catholic chapel, six public and four private schools, in which (taken together) above 900 children are taught. The church and Catholic chapels are neat buildings. The living is a rectory and vicarage, with a glebe of 14 acres. There are 12 houses besides 10 unoccupied, and 1 building: the population is 571. The town consists chiefly of one street, and is not, perhaps, the north bank of a small stream running into the Blackwater. On the bank of the stream is a large flour-mill, and in its bed is a quarry of greenstone. A body of the county constabulary is stationed here.

Emyval is in the parish of Donagh, in the barony of Trough, in the northern part of the county; it is 91 miles from Dublin; and is 15 miles from St. Mary's College. It is 6 miles from the mail-road. It contained in 1831, 112 houses, inhabited by 122 families, besides 10 unoccupied, and 1 building: the population was 571. The town consists chiefly of one street, and is not near the north bank of a small stream running into the Blackwater. On the bank of the stream is a large flour-mill, and in its bed is a quarry of greenstone. A body of the county constabulary is stationed here.

Glasslough, or Glasslough, is also in the parish of Donagh and county of Monaghan. It is a pretty village, with a church, and is 15 miles north-east of Monaghan. It is rather larger than Emyval, containing, in 1831, 153 houses, inhabited by 165 families, and 5 unoccupied houses; the population was 812. The town is on the margin of a beautiful lake (Glasslough, the green lake) which is a large sheet of water, and is connected with the Boyne by a canal. Part of the town is a large flour-mill, a mill for spinning flax, and a linen factory have been erected; and a weekly market on Friday for corn and flax established. There is a monthly fair for stock and agricultural produce. There is a dispensary. A castle and demesne, the residence of Mrs. Leslie, are near the town. The parish church of Donagh, built half a century ago, and capable of containing 400 persons, is in the town. The parish of Donagh is large, and has a gross population of 11,065. It has two Catholic chapels, a Presbyterian meeting-house, and a Roman Catholic church. The living is a vicarage, with a gross yearly revenue of 221l. 15s. 0d., tithe composition, and the rest the produce of a glebe of about 71 acres.

The villages are all small. Ballytrain, or Bellatrain (in Abbeyleix, Clones barony, Cremore barony), had, in 1831, 42 houses, inhabited by as many families, making a population of 220. It is the station of a body of the constabulary force, and has eight yearly fairs for cattle, sheep, and pigs. It has a large Catholic chapel, in which are schools for children. The inhabitants are numerous. Smithborough owes its name to a person of the name of Smith, who established monthly fairs in the latter part of the last century. It is in Clones parish, and in the barony of Monaghan. In 1831 it had 48 houses, inhabited by 50 families, making a population of 244. There is a Presbyterian meeting-house, a school, and a dispensary. All the fairs except one in the year have been given up. There is a body of the constabulary stationed here. Tydavnet, or Tadavnet, and Scotstown, are in the parish of Tydavnet, in the barony of Monaghan; both are stations of the constabulary, and Scotstown has a dispensary. Tydavnet has five yearly fairs, and Scotstown one every month. Scotstown is in the parish of Curran, in the barony of Dartree. The parish church, capable of holding 400 persons, is in the village; and a body of the county constabulary is stationed here. There is also in Curran parish, and in the barony of Dartree, a large and long. It has a monthly fair, a small chapel-of-ease, two Presbyterian meeting-houses, a school, and a dispensary. The population in and about Drum contains a larger proportion of the people of the barony of Dartree than of the barony of Curran. Rockenny, though classed by our authorities among villages, is really a small market-town; it consists of a wide street, with a neat market-house, and has many houses of respectable appearance. It has a market on Wednesday, and a monthly fair on the first Sunday of each month. There is a party of police is stationed here. There are neat meeting-houses for Presbyterian and Wesleyan Methodists, and there are an infant-school, a sewing-school, and a dispensary. Magheracloone, or Magheraclooney, is in the barony of Farney, a short distance from Carrickmacross. It has a neat modern church.

**Divisions for Ecclesiastical and Legal Purposes.**—The county is wholly included in the diocese of Clogher, and contains the whole or part of twenty-three parishes, of which only two are under the patronage of the see. There are twenty-two benefices, fourteen are rectories and vicarages united, two rectories, and six vicarages. With respect to value, one is of 200l. a year, one 1015l., one 965l., two from 615l. to 600l., one of 515l., six of from 400l. to 500l., two of from 300l. to 400l., two of from 200l. to 300l., and one of 180l. There are twenty-two parish-churches and five chapels-of-ease. The churches are smaller than the generality of English churches; one is on horseback on the side of a mountain. In the county there are 1106 persons: many of them have been erected within the last twenty years. Divine service is commonly performed twice on the Sunday, besides services on holidays. In winter the second service is sometimes discontinued. The consistorial court of the diocese of Clogher is held at Monaghan, where is also the diocesan school.

In the territorial arrangements of the Catholic church the county is included in the Catholic diocese of Clogher, the bishop of which has the right to appoint the bishop of Carrickmacross. There are forty-six Catholic chapels, and twenty-four meeting-houses for Presbyterians (of various classes) and eight for Methodists. The population of the parishes which are wholly or partly in this county is about 208,000, but may be considerably greater. The Roman Catholic church 32,000, Catholics 151,000, Presbyterians or other Protestant dissenters 25,000. (Reports of Commissioners of Public Instruction.)

For judicial purposes the county is included in the north-east circuit, which comprehends the eastern part of Ulster. The county court-house and county-gaol are at Monaghan, where the assizes are held. Quarter-sessions are held at Monaghan and at Castle Blayney. Petty sessions are held at Magheracloone, Castle Blayney, Ballybay, and Rockenny. There are bridewells at Castle Blayney and Carrickmacross. The county-gaol is well managed; its good order, economy, and regularity are highly creditable to those who direct it; and there is sufficient accommodation in cells and day-rooms for all the purposes of classification and discipline. The prisoners are all employed, chiefly at stone-breaking; and there is a tread-wheel for those who are sentenced to hard labour. There is an excellent school, and the females are attended to under a qualified master. The boys are taught to read clean and orderly, and the management of them is conducted with the greatest regularity. (Reports of Inspectors of Prisons—Fifteenth Report.) The number of persons committed for trial or bailed, in 1836, was 596; of these 120 were bound for the time being or for specified periods for debt, or other offences against property committed with violence; 63 for offences against property without violence; 50 for malicious offences against property, 2 for uttering base coin, and 50 for other offences. Of the persons convicted, 7 were commitied or discharged. No execution took place in the year. Of those committed or bailed, 302 were males (14 under sixteen years), and 58 females (1 under sixteen years); 156 could read and write, 116 could read only, and 89 could neither read nor write. The proportion of the number of offenders to the whole population of the county is great. It is said that there are many clergymen in the county who are dissatisfied with their living.
of the county is considerably below the average of Ireland, but above the average of the province of Ulster.

The number of the constabulary force in employment on the 1st of January, 1836, was 4 chief constables, 20 constables, and 116 sub-con-
stables, with 5 horses. The expense of this force for the
year 1835 was £1110. 17s. 1d., of which 2411. 9s. 11d. was
chargeable against the county. The amount of grand-jury
presentments, in 1835, was 077. 0s. 3d., viz. 010. 1s. 1d. for
new roads, bridges, &c., 0745. 17s. 0d. for repairing roads,
bridges, &c., 13535. 5s. 9d. prison, 25371. 10s. 3d. police
establishment, 23671. 15s. 9d. salaries of county offi-
cers, 16761. 19s. 2d. repayment of government advances, 4671.
19s. 7d. public charities, &c., 6325. 2s. 6d. miscel-
naneous expenses.

The county is in the district of the Armagh Lunatic Asy-
ylum. The county infirmary or hospital is at Monaghan, and
there are dispensaries at Ballytrain, Ferney, Sc国资委,
Castleheugh, Strathbogie, Ballyhoy, Clones, Newmount,
Drum, Rockcorry, Monaghan, Carrickmacross, and Glash-
ough. There were, according to the Return of the Rev.
James Carlile (May 3, 1837), in the county 43 schools in
connection with the National Board, on the roll of which were 3464 scholars, in attendance 3406; of those whose religious sentiments (or those of their friends)
were known, 484 were Protestants and 1689 Catholics.

History and Antiquities.—In the invasion of Ireland by
the English under King Henry II, the inhabitants of all Ulster
on John de Courcy when he could conquer it, that chieftain
overran various parts (a.d. 1177), and built castles to secure
its conquests. Among others he built two in the district
now the barony of Ferney in this county," and gave them in
fealty to the king, an Irish chieftain who had in all meet-
ted himself with him. MacMahon domiciled these
castles, upon which De Courcy made an inroad into the
territory of the chieftain, and drove away a great number of
the cattle. He was followed and defeated by the natives, who
had assembled to that number of 1100. By the course of
the following night, availing himself of their careless
security, he defeated them in turn with fearful slaughter,
and secured his booty.

The English dominion in this part of Ireland was very
inflexible. In the reign of Henry IV, we find that the
district of Ferney was still held by a chieftain of the race
of MacMahon, to whom Thomas of Lancaster, son of Henry,
granted or confirmed it at a certain rent. The English re-
tained however a castle in the district of Ed.ouen.

In the reign of Henry V. the MacMahons seem to have
risen in arms, for they are noticed among the septs whom
Talbot, Lord Furlinval, the lord-lieutenant, brought into the
king’s peace. All he was able to do appears to have been to
make a treaty with them, without extending the authority of the English government. Little is known of the subsequent condition of the district, or the events that occurred in it, until the reign of Elizabeth, under whom great progress was made in reducing the counties to submission. The Irish parliament assembled at Dublin passed an act for dividing into shires that part of the kingdom which had not yet been so arranged, and Monaghan was one of the shires constituting at this time. The country however still remained in an unsettled state, for Sir Henry Sidney, when lord-deputy for the last time, received the submission of MacMahon (a.d. 1575 or 1576). But shortly after, on occasion of a murder committed by MacMahon, the lord-
deputy issued against MacMahon’s lands and burned and otherwise destroyed it. In 1584 MacMahon again submitted to the lord-deputy, Sir John Perrot, who either divided Ulster into counties, or rendered effectual the division which had been before made, and placed sheriffs, justices of the peace, and an inquisitory court in each of them. The constabulary
of the county still remained in the hands of the chief-
tain of the MacMahons; but on a charge, true or false, of
raising forces to exact the payment of the rents due to him,
Hugh Roe MacMahon was tried, and executed at the town
of Monaghan, in the year 1587, by the lord-deputy, still Ulster.
Fitzwilliams, and his lands bestowed on some of his kins-
men and other persons, to hold under a yearly rent. In
the troubles excited in following years by the earl of Tyrone,
the MacMahons lost one of his dominions, and a portion of
MacMahons appear to have joined Tyrone. The English

**It is not to be assumed that the limits of the ancient district and the
modern barony exactly coincided.**

had a fort at Monaghan. In the settlement of Ulster (a.d.
1608), on the forfeiture of the estates of such as had been
engaged in the rebellion of Sir Cahir O’Doherty, Monaghan
was assigned to the province of Connaught, and was not
subsequently engaged in the war against it. The counties were.
The corporation of Monaghan was however one of those erected about this time to strengthen the Protestant and English interest.

In the great rebellion of 1641 Monaghan was one of the counties where the rebels were strongest, and in the course of the subsequent struggle was included in the seat of war; but no events of particular interest occurred within it. In the war of the Revolution of 1648 a sharp conflict took place at Glashough, in which the Pro-
testants were defeated and their losses heavy. At the end of the year Mr. Anketel, a gentleman of property in the neighbourhood.

In the rebellion of 1798 the county appears to have been
scarcely if at all disturbed.

(Beautiful’s Map of Ireland and Memori; Second Report of the Irish Revenue Commissioners; Reports of Commissi-
nioners for Inquiring into the State of the Poor in Ireland; and other Parliamentary Papers; Lewis’s Topographical
Dictionary of Ireland; Wakefield’s Account of Ireland; &c.)

MONARCHY, from the Greek monarχia, a word com-
pounded of monon, 'one,' and the element ἅγιον, 'go-
vern,' signifying the 'government of a single person.'
The word monarchy is properly applied to the government
over a people, or it may be styled a monocracy, or
under the title of monarch, and the supreme ruler is properly styled a monarch. Examples of monarchy, properly so called, are afforded by some of the small states of Greece and Italy, by the
Grand Chartreuse of Persia (where the word monarch
is applied to the grand king, or simply 'the king'), and in
more recent times with King Louis XIV., called by his contemporaries the Grand Monarque.

Now a king does not necessarily possess the entire sovereign power. Thus the title of king is not necessarily
monarch. Thus the king has shared the sovereign
power either with a class of nobles, as in the early Greek states (Müller’s Doriens, b. iii., c. 1.), or with a popular
body, as in the Roman kingdom, in the feudal kingdoms of the Middle Ages, and in the year 1550 in the kingdom of
France and Belgium. The assumption of monarch properly implies the possession of the entire sovereign power by the person to whom it is affixed. The title of king, on the other hand,
does not imply that the king possesses the entire sovereign power. In a state where the king once was a monarch, the
kingly office may cease to confer the undivided sovereignty;
and it may even divide into complete insignificance, and
become a merely honorary dignity, as was the case with the
king of France, and the king of the Romans. (Croizer’s Abrie des Römischen Antiquitaten, ¶ 123.)

In Sparta there was a double line of hereditary kings,
who shared the sovereign power with some other magis-
trates and an assembly of citizens. The government of
Sparta has been termed a monarchy, by some ancient writers who have called it monarchical, on account of its
kings; and Polybius applies the same epithet to the Roman
republic, on account of its two consuls. (Philologische
Monat, vol. ii., p. 49, 57.)

States in which at one time governed by kings possess
the entire sovereign power, and in which the king has
subsequently been compelled to share the sovereign power
with a popular body, are usually styled sacred monarchies or limited monarchies. These expressions mean that the

* On the correspondence of Μοναρχία and vat, see Gibbon’s Decline and
Fall, vol. ii., p. 566; and on the etymology of king and kung see
Dodd’s New Castles, p. 417.*
person invested with the kingly office, having once been a monarch, is no longer; and they may be compared with such expressions as πάντα θεοί, which occur in the Greek poets.

Governments are divided into monarchies and republics; and therefore all governments which are not monarchies are republics. As we have already stated, a monarchy is a government in which one person possesses the entire sovereign power; and consequently a republic is a government in which the sovereign power is shared between several persons.

[Re-Republic.] These definitions of monarchy and republic however do not agree with existing usage; according to which a monarchy was of old in the governments of England and France, for example, are monarchies (viz. mixed or limited monarchies), not republics.

The popular usage of the terms in question, to which we have just been mainly owing these causes,

1. Kings not possessing the entire sovereign power; in other words, kings not monarchs have in many cases succeeded kings who did possess the entire sovereign power; in other words, kings not monarchs have in many cases succeeded kings who were monarchs.

2. Both in royal and republican countries, the crown usually descends by inheritance.

3. Kings who are not monarchs usually affect the state of monarchs properly so called; they intermarry only with persons of monarchical or royal blood, and refuse to intermarry with persons of an inferior rank.

Governments such as those of England and France are included by popular usage, together with republics in the term 'free or constitutional governments,' as distinguished from pure monarchies, absolute monarchies, or despotisms.

Accordingly, the use of the two terms in question is as follows:

Monarchies are of two sorts, viz. first, pure, absolute, or unlimited monarchies, that is, monarchies properly so called; and, secondly, limited, mixed, or constitutional monarchies. In the latter, the crown is properly so called, that is, republics presided over by a king, or kingly governments where the king is not sovereign.

Republics are states in which several persons share the sovereign power, and in which the person of the head of the government is not a king. Accordingly, Holland with a stadholder, Venice with a doge, and England with a protector, are called republics, not monarchies.

If the head of the Venetian aristocracy had been styled king in Venice, and if his office had descended by inheritance instead of being conferred by election, Venice would have been called a monarchy, and not a republic.

The only exception to this usage of which we are aware occurs in the case of Sparta, which is commonly called a monarchy. However, Sparta is neither a true monarchies, although it had hereditary kings. The reason of this exception probably is, that there being two lines of kings at Sparta, it was too gross an inaccuracy to call its government monarchical; though its government would have been called monarchial, if one king, in succession, possessed the powers which might that king might have possessed.

The comparative advantages of a popular or republican government and of a monarchical government have been stated, with greater or less completeness and candour, by many writers. The best statement of the advantages of monarchy (properly so called), with which we are acquainted, is in Hobbes's 'Leviathan,' part ii., c. 19.

MONAS. [Microzoria.] - A poet's name for a genus of Birds (Hermits Birds of Swainson and others) [Kingfishers, vol. xii., p. 227.]

MONASTERY. [Kildare.]

MONASTERY. [Monachism; Monk.]

MONAT. - A ray of pure gold or silver, as the 国家 (chief styled LORD in his quality of one of the judges of the Court of Session), was born in 1714, at the family seat of Monboddo, in Kincardineshire, and after studying at Aberdeen, was sent to the university of Groningen, according to a custom then followed of becoming an educated man. After a French university was considered indispensable for young men intended either for the profession of law or for that of physic. Lord Monboddo has himself mentioned that his father, who was eldest son his father's family, had the advantage. He returned home in 1736, and from that time practised as an advocate at the Scottish bar, till his elevation to the bench in 1767. He is known in the literary world by two learned but paradoxical works: the first entitled 'A Dissertation on the Origin and

Progress of Language,' in 6 vols. 8vo., 1774-92; the second entitled 'Antient Metaphysics,' in 6 vols. 4to., 1778 &c. An exclusive and somewhat intolerant admiration of the language, literature, and philosophy of the antient Greeks, some singular notions about men being only a civilised species of monkeys, a preference for the virtues and happiness of the savages, a still general credulity in favour of the marvellous, are, in addition to his general conception of the moral and spiritual condition, among the most remarkable peculiarities of these performances.

Lord Monboddo however was also esteemed a good lawyer and judge, and his character in all other respects was of a high order. The general tenour of his character and conversation has been given by Boswell in his 'Tour to the Hebrides,' in an account of a visit paid to him by Dr. Johnson at Monboddo (pp. 73-80). In a note Boswell says, 'There were several points of similarity between them; learning, clearness of head, precision of speech, and a love of research on many subjects which people in general do not investigate. Poote paid Lord Monboddo the compliment of saying that he was an Elitzev而后ian edition of Johnson.' Some further account of him may be found in Kerr's 'Memoirs of Smellie,' the Edinburgh printer (vol. i., pp. 409-415). Smellie, we are told, used to be a frequent visitor at what his lordship called his learned supper.

In imitation of the antients, says Smellie's biographer, 'for his professed love of metaphysics, and in imitation of the absolute admirers, Lord Monboddo always made supper his principal meal, and his regular time of entertaining his friends. These learned suppers used to take place once a fortnight during the sitting of the courts; and among the usual guests were the Rev. Mr. R. Black, Dr. Adam Walker, Mr. Smellie, and other men of science and learning, of whom Edinburgh at that time furnished an ample store.' Lord Monboddo died at Edinburgh, in consequence of a paralytic stroke, on the 26th of May, 1799.

MONDEGO, River.

MONDOVI, a province of the Sardinian territories, on the north side of the Ligurian Apennines, which separate it from the western Riviera of Genoa, is bounded on the east by the province of Savona, on the west by that of Cuneo, and on the north by the province of Savona and Alba. The province of Mondovi consists mainly of the basin of the Upper Tanaro, which river has its source near Ormea, at the foot of the Ligurian Apennines, and flows northward by Ceva, and Ponte Cesareo, in a lofty, narrow valley, and farther down the Stura, which comes from Coni; the Tanaro then enters the province of Alba, and continues its course towards the Po. The length of the province of Mondovi, from south to north, from the source of the river Tanaro to the town of Ceva, is 20 miles; and the Tanaro, is near 40 miles; and its breadth, from the ridge of hills which divide the valley of the Tanaro from that of the Bormida, or province of Acqui, to the limits of the province of Mondovi, is about 2 miles. The population of the province is stated by Serristori (Sag. Statisti) at 118,000. The principal towns are—1. Cossa, built partly on the bank of the river Ello, an affluent of the Tanaro, and partly on a hill which rises above it: it is surrounded by walls, has a strong castle, several churches and convents, and 15,700 inhabitants. (Calendario Sardo.) Mondovi is a bishop's see, has a clerical seminary and a royal college, and manufactories of silks, woollens, cottons, paper, and hats. The country around is rich in corn, vines, mulberry-trees, and cattle. 2. Cesareo, a regularly built town, at the confluence of the Stura and the Tanaro, a fortified town with a castle, has several churches and convents, a college, two hospitals, and 8,300 inhabitants. Silk is the principal produce of its territory. Cesareo has extensive and fine buildings, as the Oratory, a large church, and the beautiful library. The town is on an elevation, and the noble family Salaminos, and that of Gott. Several of the churches and private houses are adorned with paintings by Tarico, a native artist. The district of Cesareo is well known for its silk manufactures, which have been lately rendered more considerable by the efforts of the彩朝, a country renowned for truffles. 3. Ceva, at the foot of the Apennines, has a castle, two churches, a college, silk manufactories and iron-forges, and 3,500 inhabitants. 4. Garesio, near the sources of the Tanaro, has a castle, 7,000 inhabitants, and the name of this town has given rise to a peculiar kind of cloth, called Areseian. 5. Cuneo, has a castle, some good buildings, and 5,000 inhabitants. 6. Dogliani, on the road from Ceva to Cesareo, has a college and 4,000 inhabitants.

It was by Montreuil and the valley of the Tanaro that Bonaparte first penetrated into Italy, in April, 1796.

Vol. XV.-2 T.
MONEY is not only a coin, but a system of exchange, a representation of property, whether as coin in the form of paper—the circulating medium. For money in this latter sense, and for our monetary system, the reader may refer to the articles Bank; Bill of Exchange; Currency; Exchange, and Interest.

The earliest currency of metal has been already treated of under Coin, together with the denominations, as far as they are known, of the different moneys current among the chief nations of antiquity, as well as in our own country. In the latter there is a particular account of one or two coins that were omitted; the Farthing for instance, and the Guinea, both of which have been referred to the present article.

Although Farthings are asserted to have been round coins in the time of some of the later Saxon kings, they usually at that period consisted of the fractions or parts of the penny broken into four. Instances of pennies neatly and accurately cut into halves and quarters occur almost wherever Saxon coins have been discovered. The people of Friesland, for money, is twice mentioned in the Anglo-Saxon version of the gospels (Matt. v. 26; Luke xxi. 2).

Guinea. The unite, as it was called, or twenty-shilling piece, was first coined by King James I. It was continued under a subsequent reign at the same weight and under the same denomination of the Crown or Half-Crown, as the same. The term Guinea has been because the word was coined out of gold brought from the Guinea coast by the Royal African Company, which are distinguished by an elephant under the head, some a castle, others without, which was continued under each reign until George I., though at a few, the eagle was stuck, either of him or of Queen Anne. The guineas of Charles II. had not been long in currency before common consent had raised it to twenty-one shillings. About the year of the Revolution, James II.'s guinea was paid and received at twenty-one shillings and sixpence. In the reign immediately subsequent, the gold money remaining without alteration in weight and fineness, and the silver money growing daily of less value by clipping and counterfeiting, occasioned twenty-five shillings, then twenty-eight shillings, and at last thirty shillings were given for a guinea, but sooner was the silver money restored to its first value by the grand reconnoit, than the guinea was again reduced, first to twenty-eight shillings, then to twenty-six, and finally to twenty-two, and soon after by common consent was paid and remained as before at 21. 6d., and continued at that price for twenty years after. In 1717 the guinea was reduced to twenty-one shillings, at which it continued till the latter part of the reign of George III., when the coinage was altered, and twenty-six shillings were again coined under the name of sovereigns.

Several other coins, ancient and modern, have been already disposed of under Angel; As; Aureus; Besant; Billon; Crowns of the Sun; Daric; Denarius; Drachma; Louis and Livre d'Or.

We shall now lay before our readers as concisely an account as possible of the money which forms the present or has formed the recently existing metallic currency of modern nations, alphabetically.

Abatis, or Obasus, a Persian coin of the value of 5d. Abugulp, or Albugulp, see Griscio.

Albert's Dollar is a coin known in Holland, with its half and quarter, at 50, 35, and 15s. sivers. The term is used also as a monetary unit at Lichten and Russia. The intrinsic value of a metallic Albert's Dollar is 4s. 4d.

Albus, a small coin and money of account, at Casel, Cologne, and other places in Germany; the value of the albus was less than £1.

Almohad, a Spanish silver coin of 60 paruh, value 3s. 6d., a very Turkish coin and money of account. 120 aspers = 1 piastre.

August d'Or, a gold coin of Saxony, double, single, and half, in the value of 2s. 2d. and 2s. 6d. dollars. The August of 1754 was worth 16s. 2d.; that of 1755, 17s. 3d.

Bagattino, a Venetian copper coin, a half soldo.

Bagucho, or Soldo, a copper coin at Rome, Bologna, &c., divided into 12 denarii, or 4 quattrini; worth a trifle more than a halfpenny; there are also double and single lira bagucho, at 4 and 2 bajocchi.

Bajore, a silver coin of Switzerland, of 3 livres 15 s. current.

Barbone, a silver coin in Lucca, of 12 soldi, half and quarter of a barbone. In proportion. The barbone is worth rather more than 4d.

Basarucco, a small tin coin current at Goa on the Malabar coast. There are called by Basarucco; there are others called by good ones, of copper; all the coins of Goa are of the same two descriptions and denominations.

Baten, a base silver coin in Switzerland, and also in some parts of Germany, as at Augsburg. At Basle, a good one is called a Taler; and a similar coin is known in Switzerland. Each batzen contains 10 rappen. Silver pieces of 40 and 20 batzen, and base silver pieces of 10 and 5 batzen, were published under the Helvetian republic between 1793 and 1803. The Swiss batzen is nearly 1d. English.

Bendy, a gold coin of Manza, a value of 9s.

Besitch, a Turkish silver coin worth about 3s. 2d.

Bit, or Bitt, a small coin in the West Indies worth 3d.

Blaffert, a small coin at Cologne, worth 4 alcobas.

Blanhes, or Blanquello, a small coin and money of account in their province. It is worth about 1d.

Bolognino, a copper coin at Bologna and its neighbourhood, the same with the bacocho.

Bobbis, or Barbis, a coin in Egypt, of copper, eight of which go to a medis. Bobbies are also current at Tunis.

Borjon or Borzen, a name for the glass-beads which pass as small money in Abyssinia.

Caglarraso, a copper coin in Sardinia.

Cahuas, see Conivers.

Carron, a copper and money of account in the kingdom of Naples and in Sicily: it contains 10 grains, worth 4d.

In Piedmont the carling is a gold coin; coined before 1720, it was of the assayed value of 5l. 18s. 6d.: subsequent to that year, 5l. 12s. 6d. The half, &c., in proportion.

Carozzo, a copper coin of the town of Barra, in Hesse-Darmstadt, and Wirttemberg, value 20s. 4d.

Cash, a small coin in China, and India beyond the Ganges. It is the only coin used in China. It is not coined but cast. It is composed of 6 parts of copper and 4 of silver; is marked on one side, and at the edges, with a square hole in the middle. These pieces are commonly carried like beads on a string or wire. A tale in account of fine silver should be worth 1000 cash; or about 6s. 6d., but on account of their convenience for common use is sometimes not much raised that only 750 cash are given for the tale. Cash is sometimes called Cara. In Sumatra cash are small pieces of tin or lead, 2000 of which go to a mace.

Cent, a small coin, used in account in the new system of France, and a coin in the United States of North America. In France the centime is the hundredth part of the franc. In the money of the United States the cent is the hundredth part of a dollar, and contains 205 grains of copper. The cents are coined in New York. Churay, a small silver coin of Persia, of the value of 3d.

Commassar, a small copper coin, containing a little silver, made use of at Batelugga, or Betheliscon, in Arabia.

Copang, or Coban. The old copangs weigh 37/12 Dutch morgen, or 275 English grains, and the gold is said to be 22 carats fine; this would give 2l. 4s. 7d. sterling for the value of the old copang; but it must be observed that the Japanese coins are reckoned at Madras only 87 touch, which a 25/12 carat is stated to be 21s. 10d. sterling. The new copangs weigh 186 English grains, and the gold is about 16 carats fine, which gives their value 21s. 3d. sterling.

Coroche, see Kopeck.

Coron, or Emperor de Oro, a Spanish coin of gold, of the value of 5l. 9d.

Couvies. Kelly, under 'Calcula in Bengal,' says, 'Accounts are sometimes kept in the inferior departments of business in cowries, a species of small sea shells, which, as long as they remain unbroken, are received in payment; and 2560 cowries are generally reckoned for a current rupee; but they have intermediate divisions, thus 4 cowries make 1 gunda; 20 gundas, 1 pum; 4 pums, 1 anna; 4 annas, 1 cahuan; and 4 cahuans, 1 current rupee: but the cowries of Bengal are still more extensively used for money at Scinde on the Malabar coast, at Siuan on the farther peninsula, and in Greece, where 2000 of these shells are called a masuta.'
Cox, a small Persian coin, in copper. 10 cobbuzges or cok make a shahée.

Cruce, a small silver coin in Tuscany.

Crown, a small coin in the West India Islands, called also the Devil's Bay, which pass for 7d. currency.

Crown. In England, Henry VIII was the first king who coined a crown in gold. He afterwards, as has been already noticed, struck some patterns for a crown in silver; but it was in Scotland that the coinage of the silver crown and half-crown for currency began. From Elizabeth to William IV. the silver crown and half-crown have been struck in every reign. The crown, or crown, was formerly a coin of the Netherlands; those after 1754 were estimated at 2 florins per piece. It bore 3 crowns current, or 5 crowns, on the reverse side. It was also a crown of Denmark; double, single, and half-crowns were reckoned at 8, 4, and 2 marks crown money, or 8 marks 8 skilling, 4 marks 4 skilling, and 2 marks 2 skilling crown money.

Crown, a coin in Portugal, both in gold and silver. Of the gold crusadoes there are two kinds, the old crusado of 400 rees, the new crusado of 480 rees; the silver crusado, also of 480 rees, has its half, quarter, and eighth.

The value of the old crusado was 26½d.; of the new, both gold and silver, 2½d.

Dudder, a Dutch silver coin, or 30-sitter piece, worth in sterl. 2s. 6d.

Duzajye, a silver coin of Persia, of the value of 3 maunds of silver, about 30 s. sterling.

Decnea, a money of account and coin in the Revolutionary system of France. Ten décemes make the franc, or 100 centimes. Copper pieces of one and two décimes are still current.

Denaro, a money of account in most parts of Italy.

Denier. [Denier.] It was the 234th part of the livre, or French pound.

Demushka, a Russian copper coin, half a kopek.

Dime, a money of account and silver coin in America, is the tenth part of a dollar. There are also half-dimes; both coined in 1796, worth 5½d. and 2½d.

Dittobolo, a copper coin in the Ionian Islands, the double of the obolo or cent. The cent is worth 6d. nearly.

Decan, or Peru, a money of Abyssinia.

Ducado, or Portuguese 20 reals, or six guineas. Kelly says the old dobra coined before 1720 at 20,000 reales has since become worth 24,000; the dobra struck since 1722 is of 12,800 reales. There is also a half-dobra of 6400 reales, likewise called a Joaense. The silvering value of the latter dóbora, or the moh, the silver dollar in England at 3l. 17s. 10½d. per ounce, is 3l. 11s. 6d. 2½d.

Dog, a small coin of 1½d. Leeward currency, used in the French West Indies, called also the moir.

Dort, or Dutch, a small Dutch copper coin, the eighth part of a cent for 20 reales. Plutarch notes, that the Portuguese 20 reals are also called a Dutch currency.

Dollar. The dollar of the United States of North America, weighing 416 grains of standard silver, is valued at 4s. 4d. English. It has on the edge 'ONE DOLLAR OR UNIRED CENTUR.;' and has its division of half and quarter. By an act of 1837 the silver dollar of the United States is required to contain 412½ grains of standard silver of which one-tenth is alloy; which is now the proportion in all coins of the United States, whether of silver or gold. The Spanish dollar of the old sort, before a new coinage took place in 1772, was of the silvering value of 4s. 4d. Till then there were dollars of two denominations, the Mexican and the Sevillian dollar. That which is at present generally circulated as the Spanish dollar is really the silvering value of about 4s. 3½d. It is the Spanish dollar of a merchantman of the Spanish fleet, 15th of May 1772. The rix-dollar of the north of Europe is termed Thaler by the Germans; Pezza is the Italian and Piastre the Turkish dollar. See Rix-dollar.

Doodor and Half Doodor, copper pieces of 10 and 5 cash, current in Bengal.

Doppia, or Pistole, an Italian gold coin of which the value varies in different states. Kelly says, among the prices current at Genoa, July 20, 1807, the Roman doppia was at 20 lire 14 soldi; Parma, ditto, 26 lire 14 soldi; Piedmont, ditto, old, 35 lire 8 soldi; ditto, new, 34 lire 15 soldi. At Milan the value of the doppia was fixed by an imperial edict in 1786 at 25 lire 3 soldi current. Its English value is about 15s. 7d. sterling. In the Piedmontese territory the old doppia has been long out of currency. The present is 24 lire; the half, 6½c. In proportion. The old Piedmontese doppia of 1741 to 1755 was of the value of 11s. 3s. 9d. sterling; that after 1758, 11s. 2s. 7½d. The Parma doppia of 1787 was worth 17s. 10½d.; that of 1796, 16s. 10½d.

Doppetta, or gold acudo, a coin of Sardinia of 5 lire.

Dora, a coin and money of account in Bombay; the coin is of Copper with a mixture of Tin or Lead.

Doublia, a silver coin of Tunis, valued at 24 aspers.

Doublon, a Spanish gold coin, the antique value of which was changed in 1711, the coinage which took place in 1712, when the former piece was abolished. In the old doublon was of the value of 3l. 6s. 5½d.; that of 1722, 3l. 6s. 10d. The double and the half each of in proportion.

Ducat, Dutch, a gold coin, of the value of 5 guilders 2 aspers. English value of 5s. 2d. of Brunswick, 9s. 2d. of Cologne, 9s. 3½d.; Denmark, 9s. 3½d.; Frankfort, 9s. 4½d.; Hamburg, 9s. 4½d.; Hanover, 9s. 5½d.; Hesse-Darmstadt, 9s. 5½d.; Mannheim, 9s. 4½d.; Nürnberg, 9s. 3½d.; Prussia of 1748, 9s. 4½d.; of 1757, 9s. 3½d.; Treves, 9s. 3½d.; Würzburg, 9s. 3½d.; and all the other states of Germany.

Ducat, Russian, originally worth 2½ rubles; the double 4; but in 1764 their value was raised, the double ducat to 5 rubles 60 kopeks, and the single to 2 rubles 80 kopeks. Many rates the silvering value of the Russian ducat of 1751 at 9s. 1½d.; on 23 Apr. 1787, the Russian coin stood at 9s. 1½d.; This also had its double and half. According to the table of Russian moneys given in Leigh's 'Guide to Moscow,' 12mo. London, 1835, the gold ducat of Russia at present 8s. 4d. for 4s. 3½d.

Ducat, Swedish, of gold, of the value of one rix-dollar 46 skilling, of the silvering value of 9s. 2d.

Ducat, the Italian, is a silver coin and money of account at Naples, Venice, and other places, value in sterling nearly 5s. 6d. The Venetian silver ducats of a former time varied both in weight and fineness. In weight from 13 dwt. 18 gr. to 14 dwt. 19 gr.

Ducatello, an Egyptian silver coin, current at Alexandria, for 10 medini.

Ducatone, or Giustino, a silver coin of Venice, of 1 lire, worth 4s. 6½d.

Ducatoom, a Dutch silver coin, at 63 stivers, or a little more; English value 5s. 9½d.

Ducato, called by the English Duke, a Dutch coin in use in the Mysores country, and at Pondicherry; in the latter place 20 of them are reckoned to a mina.

Eagle, an American gold coin, of the value of 10 dollars, or units. Its intrinsic value in English gold was nearly 2½s. 8d. None however have been coined at the American mint for 10 years. By act of 1775 the eagle was to be of the standard weight of 270 gr., viz. 271½ gr. of fine metal and 22½ gr. alloy. By an act of 1837, when coined it is to be of 250 gr. standard weight, viz. 232½ fine metal and 27½ alloy. The half and quarter eagle in proportion.

Ecu, a silver coin used in the old system of France, and also at Geneva and other places in Switzerland. In France it was of 6 livres; and the Petit Ecu, or half-crown, of 3 livres. The ecu, or patagon, of Geneva was worth 3 livres or 10½ florins. Those coined in 1756 were of the English value of 4s. 9d.

Escalin. The escalin, or shilling, was formerly a base silver coin in the Netherlands, at 6 stivers of exchange, or 7 stivers current. Of the English value of 6d., and its double in proportion.

Escudo, a Spanish gold coin, of 40 reals yellow.

Fanam, a small coin in the East Indies, both of gold and silver. The gold ones are only 7½ carats fine, and are alloyed chiefly with silver; 24 of these are reckoned for an old French ecu. The present over fanam of Bombay is worth about 4½d.; that of Pondicherry 3½d.

Faruki, a gold coin of Mysore, struck by Tippoo Saib, of the value sterl. of 7s. 11d. A variety of the pagoda.

Filippo, or Philip, an old silver coin of Milan, worth about 4½d.

Florin, a money of account and silver coin in Holland, Belgium, and Germany, called also gulden and guilden, and, by corruption, guilder or guilder. The florin of Holland and Baranja is worth about 1s. 6½d.; the heavy (or minus) gulden of Austria is worth about 2s. 2½d.

Florin is also a gold coin at Hanover and in other parts
of Germany, though chiefly current in the countries on the banks of the Rhine; passing generally for 2 rix-dollars current. Assay value about 6s. 11d. 

Foril, a small copper coin of Egypt. 

Fouang, a silver coin of Siam, estimated at 800 cowries. 

France, a money of account and silver coin in the new system of France, and still more recently introduced into Belgium, with its double, quintuple, and lower proportions. Of the value of rather more than 9d. It weighs 77.17 grains, and contains 69.453 grains of pure silver. The French franc and livre were formerly synonymous, but in the coinage of 1795 the franc was made too heavy, and its value was accordingly raised 11d. per cent; thus 80 francs = 81 livres. A Swiss franc, containing 10 batzen, is equal to 14 French francs, nearly 14 1/2d. 

Frank, a silver coin in Tuscany, of 10 paoli or 61 lire; its value in sterling was 4s. 6d. 

Friedrich, or Frederick d'Or, a gold coin in Prussia, worth 15s. 3d. There are also double and half Fredericks. 

Fyackle, a money of account and copper coin in Denmark; the half-shilling. 

Gall, the only coin of Cambodia, a small piece of silver, with characters on one side only; worth about 4d. sterling. 

Ganja, a small coin in some parts of India beyond the Ganges, of brass, lead, and tin; worth usually about 1/4d. sterling. 

Genovina, a coin of Genoa, both in gold and silver. Before the year 1790 the Genovina d'oro were coined at 100 lire; halves, quarters, and eighths in proportion. The Genovina d'argento were at 80 lire; quarters, at 64 lire; and eighths at 48 lire. The Genovina, weighing 232 denari, were at 9 lire. In 1790 a new coinage took place, consisting of gold Genovina at 96 lire; halves, quarters, and eighths, at 48, 24, and 12 lire; and silver Genovina at 58 lire; quarters, at 46 lire; and eighths in proportion. Genoa being united to France in 1804, the French coins were introduced there, but the Genoese coins were still allowed to circulate, and the coinage of them to continue. The assay value of the Genovina d'oro was 13l. 5s. 9d. sterling; that of the Genovina of 1790, 3l. 3s. 4d. 

George d'Or, of Hanover, at 4l rix-dollars in cash, or 5 rix-dollars gold value. Of the value of 16s. 4d. 

Gilder, or Guilder, see Florin. 

Gin, a small coin of base silver, in Italy; half a lira. 

Giustina, see Ducatone. 

Gourde, the name given to the Spanish dollar in the islands of Martinique, St. Lucia, Guadeloupe, &c. 

Grievan, or Grievena, a small Russian silver coin, worth about 6d. 

Greiço, or Albuguel, an Egyptian silver coin, of 30 Medini. 

Groat. [Coin.] 

Groat, Good (Gut), a small coin and money of account in Prussia, Hanover, and other parts of Germany. A good groscan is 3 matthiers; a marien-groscan 2 matthiers: the former worth 1d. English, the latter 1½d. 

Grosette, coins of Ragusa, of base silver, reckoned of the same value as the paras of Constantinople. 

Grote, a small coin and money of account at Bremen: 24 grotes made 1 of a specie rix-dollar. 

Guider, see Florin. 

Guiden, see Florin. 

Hasser Denare, a silver coin of Persia, of 10 mammoodis. 

Imperial, a Russian gold coin, of 40 rubles; it has its half. The English mint value of the imperial coined before 1763 has been given at 2l. 1s. 6d.; the imperials of 1763 and later are at 2l. 2s. 6d.; the half-imperial of 1780, at 1s. 4d.; the imperial of 1801, at 1l. 12s. 2d. The present value is 33s. 4d., and of the half 16s. 8d. 

Joanese, Johannes, or Jo. a Portuguese gold coin, of 6400 reais, of the value of 1l. 15s. 11d. 

Joey, the smallest of gold coins of Japan, valued at about 15 mas. 

Kaiserprachen, a money of account and base silver coin in Bohemia and some parts of Germany. In Bohemia the kaiserprachen is sometimes called böhmern. In Bavaria it is worth of 3 and sometimes 4 kreuzers. 

Kosama, a little globular piece of silver, bearing the figure of a Japanese deity, with several letters. 

Kopeck, or Kopack, a money of account and copper coin in Poland, or the Polish penny. Inglish. There are pieces of 10, 5, 2, 1, ½, and ¼ kopecks; likewise of 2½, 2, 1½, 1, ½, and ¼ kopecks, in silver, answering to 10d., 8d., 6d., 4d., and 2d. 

Kreuer, Creutzer, or Cruisier, a small copper coin and money of account in many parts of Germany, worth ½ of a penny. 60 kreuters go to a silver florin of Holland or Bavaria. 

Lin, an old coin and money of account in Persia and Arabia, of 24 mammood. It consists of a silver wire, about half an inch in length, doubled up, and fastened on one side to receive the impressions of some characters. 

Lotgoldene, a silver coin of Tuscany, similar to the franceseone; that of 1790 was of the assay value of 4s. 5d. 

Lourd, an old copper coin in the new system of France, of the value of 3 deniers. 

Lira, a silver coin of Italy, particularly at Milan and Venice. At Milan it was worth 4 denari, or ½ of an ounce. In Venice, it was worth 1, and ½ lira were coined there at Venice in 1802, consisting (in Austrian money) of 18, 12, and 6 kreuzers, which contained only ½ of fine silver. This money was called moneta di nuovo stampo. The lira of Milan is stated by Kelly to be of the assay value of 1½d.; the lira of Venice, 2½d. and 2½d. 

Lira, base silver pieces, current at Venice, of 30, 20, 15, 10, and 5 soldi. 

Livornina, an old silver coin of Leghorn, value 4s. 5d. 

Louis, a gold coin of Malta, double, single, and half. 

Mamood, or Mamoudi, a silver coin of Persia, and constant in weight. 

Maddock, a small copper or silver coin, current in the Oons, at 20, 10, and 5 soldi. 

Madonna, a silver coin of Genoa, of 20 soldi. There were formerly double and half madonna, of 40 and 10 soldi. The double madonna was of the value of 1s. 4d. 

Maths, or Mathis, a small silver coin of the July, in the Oons, at 20, 10, and 5 soldi. 

Mecin, or Maximilian, a gold coin of Bavaria, value 13s. 6d. 

Medlin, or Medino, a coin and money of account in Egypt. Kelly says, at Cairo 40 medini are valued at 1s. 7d. 

Mirition, an old French gold coin. 

Moco, a small silver coin in the West Indies, which consists of a round piece cut out of the centre of the Spanish dollar. It sometimes ½ and sometimes ¼ of the dollar. 

Mohur, a coin of gold in the East Indies. The mohur or gold rupee of the emperor Shah Alum, 1770, was of the value of 1l. 13s. 6d.; the mohur of the same, 1787, 1l. 13s. 4d.; the sicles gold mohur of Bengal, of 1795, 1l. 13s. 7d.; the old Bombay mohur, 1l. 10s. 1d.; Surat mohur of the latest coinage, 1l. 9s. 2d.; Tippoo's gold rupee, 1l. 12s. 1d.; mohur of the Dutch East India Company, 1783, 1l. 12s. 4d.; ditto, 1797, 1l. 10s. 10d. Some of these had halves and quarters in proportion. 

Moidore, or Moidoine, an old gold coin of Portugal, of the value of 1l. 6s. 11d. sterling. It had its half, &c. in proportion. 

Murajola, a small silver coin used at Bologna, double and single, of 1/2 ducat. 

Napoléon, a gold coin in the new system of France, the successor of the lous d'or, of the value of 20 francs. The value is 15s. 10d. and of its double, or 40-franc piece, 1l. 11s. 6d. The napoleon weighs 9.956 grains, and contains 6.7 grains of pure gold. 

Noble. [Coin.] 

Noir, see Dog. 

Oban, the largest gold coin of Japan, three times the value of the copper. 

Ozan, the silver coin of the value of 30 tari, each tari being subdivided into 20 grani. Its value is about 10s. 3d.
one of account and copper coin in Sweden. *Orelin*, a silver medal rather than a coin of Venice, formerly distributed by the government. Kelly says however they have been circulated at 3 lire 18 soldi. He gives the value in sterling at 1s. 7d.

Pogada, a gold coin on the Coromandel coast, in the East Indies. Kelly enumerates several kinds, with the assay value of each annexed, viz. the star pogada of the value of 7s. 6d.; old Arcot pogada, 7s. 2d.; new Arcot pogada, 5s. 6d.; Onore pogada, 7s. 10d.; Mangalore pogada, 4s. 6d.; pogada with a crescent and one figure, 7s. 6d.; pogada of Pondicherry, 6s. 5d.; Hyderabee hoon, or pogada, 7s. 8d.; Sultanee hoon, or pogada, 8s. 3d.; Tippoo's farufee, 7s. 11d.

Puloo, a small silver coin at Florence, Rome, and other places in Italy; its value being one is double, half, and quarter. The value of the puloo is 5s.

Popta, a small silver coin of at Goa; as a coin it is worth four good tangas, equal to 2s. 6d. sterling. There are large-xerapenos of very large tangas: a xerapeno is worth 3s. 1d.

Pardo, or Parado, a silver coin and money of account at Goa; as a coin it is worth four good tangas, equal to 2s. 6d. sterling. The value of the pardo is 6s. 6d. sterling.

Ptolemaic, or Postelmaic, a silver coin of Brazil, of 600 and 640 reis, current only in that country. Kelly gives the stering value of two or three sorts: the old pataca of Brazil of 640 reis, 2s. 10d.; pataca of 600 reis, 1755, 2s. 10d.; ditto of 640 reis, 1765, 2s. 10d.; ditto of 640 reis, 1801 (half, quarter, &c., worth 2s. 6d.)

Putagon, or Puataon, called also Ecu, a silver coin in Switzerland, and also at Liége. In Switzerland its value is 3 livres 6 sous, or 33 batzen. At Liége it is worth 4s. 4d.; at Berno, 4s. 2d.

Puquem, a Spanish silver coin: the old Mexican peceta of two Mexican reals, 1736, was of the value of sterling in 1s. 1d.; the peceta of two reals of plate, 1721, and the peceta of two reals of new plate, 1775, 10d.; Mexican peso, 1757, 1s. 4d. 8d.

Penny, English (coin).

Perpero, a silver coin of Ragusa, of 12 grossetti.

Pfennig, a Prussian coin, worth one-tenth of an English penny.

Pitsa, a money of account and a copper coin in Turkey and the Levant; it is in fact the Turkish dollar. The piaster of Mustapha III., 1757, was of the sterling value of 1s. 10d.; the piaster of Abdul-Hamed, 1773, 2s. 8d.; another of the same period, 1s. 10d.; the piaster of Belim, 1781, 1s. 1d.; the coin of Coin Tartary, 1778, 1s. 6d.; the piaster of Tunisia, 1767, 1s. 1d.; the piaster of Smyrna, of 1808, 1s. 9d.

Piesa, a money of account and a copper coin in the East Indies, the latter a mixture of tin and lead, current at Bombay.

Piece of Eight, the Spanish dollar; also a money of account in what was used to be the Danish West Indies Islands.

Pistereen, or Pistarine, the name given in the West Indies to the Spanish pecetas. Kelly says pistereens are 50 pieces each, or Spanish pecetas, pass for 1s. 3d. currency, and are worth 10s. 4d. sterling. He adds, English shillings and sixpences occasionally pass here for pistereens and bits.

Poco, German. Under this name are included the old Saxon August d'Or, Prussian Frederick d'Or, Brunswick Carl d'Or, Hanoverian George d'Or, Danish Holstein Christian d'Or, and the pistoles of Hesse, the Palatinate, Hildesheim, and Mecklenburg, all reckoned at 5 rix-dolars. Pernett's Kelly gives 45 pieces of each of these sorts of money are to weigh a Cologne mark of fine silver. An allowance is however generally made for deficiency in weight and fineness, and they are current in most places as long as 35g pieces weigh a Cologne mark of gold, 211 carats, or a mark of 493 of the pastier pistoles.

Pistole, Italian, see Doppia.

Pistole, Spanish, see Doublem.

Pistole, Swiss. The old pistole of Geneva was of 11 livres 10 sols; the later pistole, coined after 1792, 10 livres current or 35 florins, with double and triple pistoles in proportion. By a law of the diet of the Helvetic Confederacy of 1804, such of the cantons as wished to have them were to regulate the coinage in such a manner that the franc might contain 8½ Swiss grains of fine gold. The stering value of the old pistole of Geneva, according to Kelly, was 18s. 4d.; of the new pistole at 1s. 1d.

Pitty, small coins in the Isle of Java, the only money of the natives, containing four parts of lead and one of tin: 25 of these pass for two duitts, or duya.

Ploetor, or Ploeter, a silver coin in the Netherlands, of 3½ stivers current. Old pieces of this denomination pass for 2½ stivers. Value in sterling 2s. 4d.

Plates, the denomination given to certain large copper coins, formerly used in Sweden. Kelly says, 'The large copper pieces of the value of 4, 3, 2, 1, and ½ silver daler, or 12, 9, 6, 3, 2, and ½ koppar dalter, weighing 7s. 5s. 3½, 1½, 1s. 1d. and ½ lb. of the victuall or common weight, are no longer considered as a legal coin, but as a sort of merchandise, which is sold at market, or exported after paying the duty on exportation. Those in general, but more particularly the 2-dalter pieces, are called plates.'

Plot, a silver coin formerly used in Sweden, ½ of the rix-doller, of the value of 1s. 6d. sterling.

Polting, Poltina, Poldina, Russian silver coins, of 50 and 25 kopeks, the half and quarter ruble. The poltin of the empress Anne was of the value of 1s. 6d.; that of Elizabeth, 1s. 10d.; of Catherine II., 1s. 7½d.; of Paul, 1s. 7½d.; of Alexander, 1s. 7d. The halves in proportion.

Polturi, a coin of Hungary, which, with the groschels and pfennigs, sometimes contains a little silver, and sometimes consists entirely of copper.

Polshusha, a copper coin of Russia, a quarter kopek.

Quadraple, the four-twelth of 5 escudos, or quadruple pistole of Spain. Its value in English gold coin has been stated to be 3s. 4d. sterling.

Quattrino, a copper coin in Italy, of 4 denari of lira. At Rome 4 quattrini make 1 paolo.

Ragnnaa, see Rupee.

Rauscheprivengier, a silver coin of Aix-la-Chapelle, double, single, and half, of 2s. 16, and 8 marks, value 1s. 4d., 8d., and 4d.

Rie, a Portuguese money of account. The gold milreis (piece of 1000 reis) which was coined for the African colonies in 1755 was of the value of 3s. 2d.; but the milreis is generally valued at about 5s.

Real. There are three small Spanish silver coins called reals, namely, the Mexican plate, the real of provincial plate, and the real vellon; the two former are worth 5d., the real vellon 2d. sterling.

Rix-dollar (a corruption of the German Reichsthaler), a money of account and silver coin in Holland, Germany, Sweden, Denmark, and Poland; the rix-dollar is worth 2½ gilders, 50 stivers, or 600 pfennigs, equal to 1s. 4d. Flemish. In Germany the rix-dollar is worth 2 florins. The assay varies, but the general value, English, is 4s. 2d.

Rube, a new monetary system was introduced into Denmark. Two of the riksdaler or bank dollar are equal to 10 old specie dollars; and the new dollar is divided into 6 marks of 16 skilling each; its value is about 2s. 3d.

Rubble, a Turkish gold coin, the third of the sequin, which is called markusche.

Rupee, a Turkish silver coin of 10 paras.

Ruble, or Rubble, a money of account, and a platinum and silver coin in Russia. The platinum coins are a six-rouble piece, value 18s. 6d., and a three-rouble piece, of 9s. 3d. Of the silver roubles, there is the old rouble, before 1763, worth 3s. 6d.; the new rouble, since 1763, worth 3s. 1d.; with the halves of each in the same proportions.

Randstyk, a Swedish money of account and copper coin, of 1 ore koppa; there are also half-randstaken.

Rupee, a money of account and silver coin in the East Indies. The coins, which were formerly struck at the Calcutta mint, were sieca rupees, also called silver rupees, and gold molhus, sometimes called gold rupee; 16 of the former, by regulation, were to pass as one of the latter. 7½ silver rupees, or its half. Kelly says, 'The old Bombay rupee was the same as that formerly coined at Surat under the Mogul: it weighed 178·314 English grains, and contained 1·24 per cent of silver. By an agreement of the English government with the nabob of the Deccan the rupee was re-coined by both were to circulate at an equal value; and they mutually pledged themselves to keep up the coin to its exact standard of weight and fineness. The nabob's rupees however were soon after found to contain 10, 12, and even 15 per cent of copper, in consequence of which most of the Bombay rupees were melted down and re-coined.'
at Surat: the coinage of silver in the Bombay mint was suspended for twenty years, and the Surat rupees were the only ones seen in circulation. At length, in 1808, the company ordered the Surat rupee to be struck at Bombay, and since that period the rupees of both places have been kept at an equal value, weighing 179 English grains, and valued at 26. 3d. In the company's financial accounts submitted to parliament, the Bombay rupee is reckoned at this value, at the rate of 19 or 20 per cent. against current rupees. Kelly, 'Universal Cambist,' 2nd edit., 4to, 1852, vol. i., p. 170, gives a large list of rupees, with their assay and value in sterling, varying from 14. 10d. to 20. 6d. The rupees of the average piece of 10 mark pieces:

Rupsona, a gold coin of Tunisia, a piece of 3 sequences, weighing 8 denari 21 grani, Florentine weight, and passing for 40 lire or 60 paoli. Value in sterling, 15. 5s. 5d.

Ryder, or Ryder, called also Stanpenning, a gold coin of Holland. By a regulation of 1745, its value was fixed at 14 florins. Value in, 1s. 4d.

Ryktor, a Danish silver coin at 24 skilling.

Schilling, or Shilling, also called shilling and escalin, a money of account and copper or base silver coin in several parts of Germany, at 12 pfennigs.

Schilt, a silver ingot used as money in Japan. It is of the value of 10. 5s. 3d.

Scudino, a gold coin of Modena, of 9 lire.

Scudo, a money of account and a silver coin in many parts of Italy, at Sicily, and Malta. The scudo of Rome is worth 4s. 4d.

Scheilling, a copper coin of Hamburg, of 6 pfennigs.

Semis, or Cashes, are small pieces of iron, copper, or brass, having a square hole in the middle, through which it is tied to a string on a wire or thread in various numbers, 600 of the smallest being reckoned for a talent.

Seguin, or Zecchin, Italian, called also Giglato, a gold coin of Venice, Genoa, Rome, Milan, Piedmont, and Turin. By a regulation of 1745, its value was fixed at 14 florins. Value in, 1s. 4d.

Seguin, or Chequeyen, Turkish: the gold coins of Turkey are the sequin fundului, with halves and quarters; the double sequin, or yermeesblish, the misser, and the rubich. There are other sequins beside the above, which have different weights, and their values also vary according to the periods of their coinage.

Sestalif, or 24-silver piece, a base silver coin in Holland, or base shilling; value 54d.

Shaker, or Shatree, a Persian silver coin, the half of the mansu.

Shilling, English silver coin, weighs 87-27 grains, and contains 80.727 grains of pure silver.

Shoe of gold, an ingot used as money in China. The name is English. Kelly, speaking of Canton (vol. i., p. 67), says it is considered as money, but as merchandise; it is sold in regular ingots of a determined weight, which the English call shoes of gold; the largest of these weigh 10 talents each, and the gold is reckoned 94 touch, though it may run to 92 or 93. Value, English silver coin, half a shilling.

Shilling, see Shilling.

Silt, a copper coin of Sweden, single and double, of 1 and 2 ore silver, or 3 and 6 ore copper.

Solido, a small copper coin of Italy. There are half soldi, and quattrini, the fifth part of a solco.

So, or Sol, a money of account and copper coin in France and Switzerland. Everywhere of 12 deniers.

Souverain or Seeroin, a gold coin, chiefly coined in the Netherlands when subject to Austria. Its value was 13l. 10d.

Sovereign, English gold coin, weighs 123-274 grains, and contains 113.001 grains of pure gold.

Stambool, a Constantiopelion coin, current at Basora for 20 finniges.

Stiver, a money of account and copper coin in Holland and the Netherlands, containing 2 groats Flemish, or 8 ducats, or ducats.

Stoork, or Schoure, a money of account and copper coin of Bremen. The smallest piece there current.

Suftor, a copper coin of Emden, at 5 witheens; 100 go to the rix-dollar.

Talaro, a silver coin of Tuscany, Ragusa, and Venice; at Ragusa it is or was the highest silver coin, worth 3s. 1d. sterling; it had also the names of vialeno and Ragunins.

Tale, see Cash.

Taro, a money of account and copper coin of Naples, Sicily, and Malta, of the value of 4d.; 12 go to the small sicilian dollar. There are pieces of 4 and 3 taro.

Testone or Testoon, a silver coin in Italy, and also in Portugal. In Italy the testone of Bologna is rated at 1 soldi; at Parma the testone is of 6 lire 6 soldi; at Rome 4 soldi. Kelly gives the sterling value at a little more than 14. 3d. The assay value of the Portugal testoon be great, at something more than 6d. sterling.

Thaler, the ordinary name in Germany for the rix-dollar.

Veinsten de Oro, see Cornillona.

Vintex, at the testoon, the highest silver Portuguese coin current of 6 vintems, or 120 rees. At Rio de Janeiro, Brazil there are vintems of copper also current for 20 rees, with half and quarter vintems, and two-vintem pieces.

Xeraphin, see Pardo.

Zloty, a Polish money, worth nominally 15 kopke, but passing current for 60 kopke. It is worth 4d. English.

Zolota, or Izelotta, a Turkish silver coin, of 10 para.

In the above enumeration of moneys have been only noticed where they were represented by real coins, both of merchandise and of which are not represented. For these our space will allow us only to refer to the general index and Commercial Dictionary appended to Kelly's 'Universal Cambist,' a work to which the present article is greatly indebted.

It is a principle of observation, says Kelly, that the progress of metals as representatives of property seems to have kept pace with the increase of wealth and commerce. This is true of brass, and copper first answered the purposes of man. Silver next succeeded, after which gold was adopted; but the gradual increase of business in time has rendered even the precious metals insufficient as a circulating medium. Paper therefore has been substituted in various ways; and it is generally found more convenient and efficacious than the precious metals are necessary; but where well founded credit exists paper is greatly preferable; it is exempt from most of the imperfections and disorders of coins, and many other respects it greatly facilitates the operations of trade and commerce.

Money of account may be considered with respect to coins as weights and measures with respect to goods, or as a mathematical scale with respect to maps, lines, or other geometrical figures. Thus they serve as standards of the value of both of merchandise and of those which are not represented. It should however be remarked that money of account, though they are uniform as a scale of divisions and proportions, yet they fluctuate in their intrinsic value with the fluctuation of the coins which they measure or represent.

There is a great inconvenience in the present system of money reckoning and the coins of most people, and particularly when we have to change money of one nation into equivalent in the money of another nation. It is also very inconvenient and tedious to add large sums, such as pounds, shillings, and pence, in the money of our own country, or in the United States of North America, the advantages arising from the dollar being the money of account, and being divided into 100 equal parts or cents, are very obvious. A slight inspection of such questions as occur in the commerce of that country will show the great facilities which this monetary system offers for all mercantile transactions. An ingenious correspondent has observed that it would be easy to bring our own system of coins to a certain perfection and simplicity. We should not be able to coin, and then we might say ten shillings make one pound. If a double penny of silver were coined, at the value of one-tenth of this double shilling, we might then say ten pence make one shilling. With a small attention to this, and the like, the province of money making, would be as easy as the province of making dimes (tenths), make one penny. There would then be no number of a denomination less than a pound that would exceed nine. The table of English money would then thus be

<table>
<thead>
<tr>
<th>Old money</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 dimes make 1 penny</td>
</tr>
<tr>
<td>10 pennies = 1 shilling</td>
</tr>
<tr>
<td>10 shillings = 1 pound</td>
</tr>
</tbody>
</table>

(Smelling's View of Coins at this time current through Europe, 8vo, Lond., 1766; Marsden's Numismata Orontadi Illustrata, 4to, Lond., 1835-5; Kelly's Universal
architectures, fortification, &c. &c.; but not with much profit.

Of this pure mathematics, we have spoken in our analytical discoveries of Monge and Laplace. He first applied the differential theory of surfaces, in doing which he was the first to give the consideration of the sum of all that illustration and clearness had, by means of plane geometry, the difficult case of two variables. He was a fervent of predecessors and rivals; it was made by him. He was neither the time of Euclid and Archimedes, nor of no such accession as he was to be known by the memory.

MONGHIR. (Hist.)

MONGOLIA (the) bends a vast extent between 38° and 53° length from east to west from north to south; in other words, the Siberian, on the China, and (which one dismember or the other).

The science of descriptive geometry, with its numerous applications to the description of machines, to perspective, to the restoration of the Ecole des Beaux-Arts, to the appearance of the Turin memoirs, of the Académie des Sciences of Polytechnique, of Correspondance Polytechnique, of the Chimie, and of Description de l'Égypte.

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tile valleys and mountains, partly wooded, as far west as the place where the Hoang-ho river turns southward: this fertile tract is included in the Chinese province of Sze-chi and Shan-si. But the tract farther west, which is surrounded by the great northern bend of the Hoang-ho, partakes strongly of the features of the Gobi, and forms part of Mongolia: it is called the country of the Ordes, taking its name from the tribe of which 5000 are reported to the great division of the Tahkakh Mongols. This whole tract is covered with hills composed of loose sand, mostly without water, and entirely destitute of trees. But the numerous depressions contain extensive meadows, with rich grass and bushes. Attempts to introduce crops of Mongolia plants have proved successful, and accordingly it is abandoned to the Mongols and their herds; but in order to prevent them from plundering the adjacent agricultural districts of the near-by Chinese province of Si-nan-ku and Kao-si, the great Chinese wall was built across the peninsula from east to west from Pao-teh-cho to Ning-hua.

That part of Mongolia which is to the east of the Khing-khan Olii, and extends nearly to the shores of Hoang Hai, or the Yellow Sea, from which it is only divided by a narrow fertile tract belonging to the province of Leao-tong, is called Kortashin. This name is properly only applied to the tract north of the river Sira Muren, or Leao-ho, which resembles the country of the Ordes, except that it is less intersected by numerous branches, and that the soil is less fertile; but south of the river Sira Muren the country contains numerous meadows clothed with rich grass, and agriculture has been introduced here by the Chinese, who seem to have found this district very suitable for the purpose of transportation. The greater part of it however serves only as pasture-ground. This was the condition of the country above a hundred years ago, when it was visited by Europeans. It would seem however that agriculture must have greatly improved during the last 20 years. It is known facts that great quantities of grain, especially wheat, are exported from the province of Leao-tong to Peking and Shanghai.

The most southern district of this country is traversed by an offset of the Khing-khan Mountains, which branches off the main range near the peak of Petsha, and extends in a south-easterly direction to the Hoang-hai, where it forms the high, rocky, and mountainous shores along the western side of the gulf of Leao-tong north of the mouth of the river Lan-ho. The deprivities of this range are abundantly watered, but the northern side is bare and destitute of wood; whilst the southern is overgrown with pine, fir, oak, lime, walnut, and other trees, and is the haunt of numerous wild animals, among which are tigers, leopards, and bears. It is to this hunting-ground of the Chinese emperor, and contains the royal palace of Ichol, which was visited by Lord Macartney and described by Sir George Staunton. The tract on both sides of the Lan-ho is an agricultural country of great fertility. Though it is situated within the boundary of Mongolia, it is inhabited by Chinese, and is very populous. Besides several small towns, it contains the large town of Quan-taishing.

This part of Mongolia extends along the north-western side of the Ta-Gobi is nearly unknown, with the exception of the eastern part, which is traversed by the caravan road from Kieachta in Siberia to Khelgan in China. Here too the surface of the country is frequently broken by hills and isolated ridges; but the intervening level tracts contain rich pasture-ground. It is mostly well watered, but wood is scarce. In advancing northward the hills grow higher, and the valleys or intervening level tracts become narrower, till near the boundary-line between Mongolia and Siberia, the whole country, which runs in a continuos chain, and are that portion of the Altai Mountains which is known under the name of Khing-khan Olii. [ALTAI MOUNTAINS.] The width of this mountainous and uneven country is very great, like that of the capital of the Tungus, and is reckoned on an average to be about 150 miles. In it originate the river Selenga and its numerous upper branches, of which a short account is given in ALTAI MOUNTAINS, vol. i. p. 399. Here also rises the Kerlen and the Oroon, two large rivers which drain the country to the North. [Auro, vol. iv., p. 477.] This part of Mongolia is called Koottoktuik. It forms a separate government of the Chinese empire, under its general governor, called pung, or hian-pung, as well as the lieutenant, called amban, reside in the town of Urga, or Uoorg. This town is built in a small plain; but though sheltered by mountains against the northern winds, it is too open to be a country in which common vegetables to be raised, which are accordingly brought to it from Mai-mat-shin, a place two degrees farther north. Its population does not exceed 7000, of which 5000 are Mongols, or born in the country, the rest being ecclesiastical establishment of the Kootokoottuik; but it is a place of considerable traffic, being a depot for the goods intended for the trade with Siberia, and also for those Chinese productions and manufactures which are consumed in the country. The capital is too confined to permit the issue of the Altai Mongolians, whose tribes wander about in the Ta-Gobi and the adjacent countries, are obliged to reside in this town, in order that their views may be known to the Chinese governor, who is a Mandahoo, and commonly a relation of the em- peror. Here also is the supreme court, called Yamoun, for the administration of justice in that part of Mongolia which is inhabited by the Khalkas. This place may in fact be called the capital of Eastern Mongolia. The small town of Mai-mat-shin is on the very boundary-line of Siberia, and less than a mile from Kieachta. [Kieachta, vol. xiii., p. 299.]

The western portion of Mongolia, extending from 84° to 96° E. long., between Siberia and the most western extremity of the province of Kan-su, has never been visited by Europeans. The interior is dry and barren, and from the geography of the Chinese empire, the Tsy-tsing-hoei-tien, and the maps annexed to it. Though a great number of localities are indicated on it, we are unable to turn any idea of the country's extent or its fitness for sustaining a population. Its western part is traversed by a mountain range, which, near its western extremity is connected with the Altai mountains, not far from the eastern banks of the Iril river, a great branch of the Yenisei. This range, which appears on our maps the Great Altai. It seems to rise to a considerable elevation, but to disappear about 94° E. long.; for farther west isolated mountain masses or short ranges occur in the same degree. The eastern or Mongul branch of this range seems to partake largely of the nature of the Gobi, extending mostly in extensive sterile plains. The great number of rivers which, descending from the southern declivity of the Ektag Olii, join the Irilis before it reaches the lake of Zaizan, seem to indicate that a tract of fertile country extends along the northern banks of that river. The Irilis is the largest river in this country, and probably runs 160 miles before it falls into lake Zaizan. Another large river, the Oroongoo, falls into lake Ksialtaas, which is situated between 91° and 92° E. long. The Olii-der-oom is a branch of the principal chain of the Altai mountains, appearing to be traversed by several subordinate ridges running east and west. Though it is much better watered than any other part of the country, it is still particularly adapted especially towards the east, but towards the west the tracts of pasture are more extensive and less interrupted by sandy districts. In this part there are several extensive lakes, all of which receive considerable rivers without having any outlet. The most northern is the Upa Nor, which receives from the east a considerable river, the Tea, besides several smaller ones. The Yeke Aral Nor, to the southwest of the Upa Nor, is the receptacle of the Dzabakan, a river whose course can hardly be less than 500 miles. In this part Mongolia extends to the north of the Altai mountains, comprehending the country in which the upper branches of the Yensesei have their origin and course. The range mountain, which divides the last-mentioned tract from the lake Upa Nor and the river Tea is called the Tangnoo-Olii. This part of Mongolia is divided into two governments, the government of Kobdo and that of Uliassutai, the boundary between them running along the eastern declivity of the mountains. The Tungus live far from the northern extremity of lake Yeke Aral Nor: the capital of the latter is Uliassutai, situated on the river Iro, an affluent of the Dzabakan. The latter is stated to contain 2000 houses, which are built in low structures; this is the border between Urga and to China, and its commerce seems to be considerable. Nothing is known of Kobdo. A general, appointed by the Chinese emperor, resides in each town, a Mandahoo by birth, who has under his inspection the Mongol inhabitants of the country; he unites in his person the military and civil authority. Vol. XV.—2 U
As the whole surface of Mongolia, with the exception of the deep depression of the Ta-Gobi, is more than 3000 feet elevated above the sea-level, and as it stretches out in vast plains, to which the comparatively low ranges of mountains along the northern border cannot afford shelter against the northern and north-eastern winds, the climate is much colder than in that part of Siberia which extends along the base of the Altai range west of lake Baikal. No month in the year is free from snow, and even frost, though the heat in summer is often delightful, supports the growth of the grass, trees and the sandy surface of the country. Sudden and great changes in the temperature are of frequent occurrence. It is however remarkable that the numerous herds which pass the winter and subsist on grass all the year round; and even after a full snow the grass is seen above it, and serves to nourish the animals. This evidently shows that the quantity of snow which falls is comparatively small, and much less than that which annually covers the northern countries of Europe or of North America. This fact is a proof of the great dryness of the air; and to this want of moisture the unfitness of the soil for agricultural purposes, even where it is not composed of sand or stones, is mainly to be attributed. A little millet is grown in a few sheltered places on the hills, which form the margin of the woods. Rain is rare, except near the great ranges of mountains, especially about Urga. Timkowsky observed that in the months of October and November the thermometer descended to + 10°, 9°, and -10° and -16° at Urga, in January, 14°, 10°, 5°, and 7°. Galba and pease are frequent, and, especially in the Gobi, blow with great force, and frequently for many days together.

The wealth of the Mongols consists in their numerous herds of horses, sheep and goats. Cattle are only numerous on the more hilly tracts, especially towards the boundary of China; there none are in the Gobi. Asses and mules are only found in the vicinity of China. Wild animals are numerous, especially hares, antelopes, dahlguiats or wild asses, and, especially in winter, fowls. On the Pron in the Gobi, abundant. In some places the desert is covered with small stones, among which several kinds of precious stones occur, as chalcedony, agate, onyx, jade, carnelian, &c., which are collected by the Gobi tribes.

Inhabitants—The inhabitants are called Mongols, and constitute the principal stock of a nation which is widely diffused over the extensive table-lands of central Asia. This nation is divided into two great divisions, the Eastern or Tchakha or Tchakha-Mongols, and the Western, or Calmucks, or Calmucks. Of the latter an account is given under Calmucks. All the tribes belonging to this nation have, from time immemorial, led a nomadic life, and subsisted on the produce of their herds; they are now attempting to throw off the old life, for the good or bad, is an circumstance which must be attributed to the countries they inhabit being entirely unfit for agriculture, with the exception of very small tracts.

The Proper Mongols inhabit that portion of Central Asia which is bounded by a line beginning at the most northern extremity of lake Baikal, and thence extending west-south-west to the northern extremity of lake Balchak, and thence running east-south-east to the banks of the river Hoo-lang, where the range of the Alaskan rises near the town of Ying-hia. From this place it follows the great wall of the Chinese empire, almost in all its extent, and from its eastern extremity it runs north-eastward to the junction of the rivers Nonni and Songari in Mandchouria, whence it returns to the north before lake Baikal. These whole country is compassed by this line is in possession of the Proper Mongols, with the exception of some plains between the Ektag Altai and lake Balchak, which are occupied by Calmuck tribes. There are however Mongols also in other parts of Asia, especially in the islands about the hoop, and about lake Kookoonor, and in the western parts of Tibet, where they are called Khoh-Katah Mongols. But our information about these last-named branches of the great nation is extremely scanty, as those countries have never been visited by Europeaners. All however the same language, and admit that they all belong to the same nation, and have a common origin.

The Proper Mongols are divided into three great nations, the Khalkha, or Khalbah Mongols, and the Tsakha or Tshakha Mongols, who inhabit the best part of Mongolia, being in possession of the tract which skirts the great Chinese wall on the north, and extends to the Ta-Gobi, a distance of from 150 to 200 miles from the wall. They obtained the full confidence of the court of Peking by yielding to the sway of the Mandchus, before they had made any considerable progress in the conquest of China. The Khalkha or Khalbah Mongols occupy the northern part of Mongolia, along the southern border of Siberia. They voluntarily submitted to the Chinese emperor, to avoid destruction in their unsuccessful war with the Oeloth Kalmucks in 1668. The Sunnit occupies the country between the northern part of Mongolia and Khalkhi, or the part of Mongolia through which the Tsakha or Tshakha Mongols pass. These are numerous and powerful than their neighbours, and less esteemed by the Chinese. They submitted to the Mandchus when the Tschakh joined them in 1634.

The Mongols have no literature; indeed their mode of life prevents them from having one that has originated with themselves. The Arabs and Mongols however have a literature, and they owe it to having conquered nations who had advanced much further in civilization than themselves; the Arabs to the Persians, and the Mongols to the Chinese. But as the Arabs preserved their dominion over the conquered nations for many centuries, their literature acquired a great degree of originality and extent, while that of the Mongols, who were masters of China only for a short period, is not so extended. They have only a few books, and a few original historical works, especially the history of their great hero, Gengis Khan. We are however very imperfectly acquainted with their literary compositions. The court of Peking takes great care to maintain a love for literature among its people, and wind and snow are but the surest means of diverting the thoughts of their princes from ambitious enterprises and from disturbing the peace of the country.

The whole Mongolian division is divided into twenty-six tribes, called aimak. Each of these divisions has an hereditary prince, except the Khalkha, who constitute one aimak, but are governed by four hereditary princes, called khan. All four claim a descent from Gengis Khan. Each aimak has its territory, in which its princes have their herds. The order of society resembles the feudal system, and the noblemen are called taidashis. The Mandchus have introduced among them a military division, according to which the whole nation forms 132 banners, each of which is subdivided and represent a military company. Some of them serve as horsemen from his eighteen to his sixteenth year. The Mongols are governed by the decrees of the Li-fan-yuen, or Tribunal of Foreign Affairs, which has instituted for them a civil government, resident at Urga, and having its several military departments, at Urga, and other places. All their princes are obliged to pay a fixed tribute as a token of their dependency, but it is small, and they receive ten times its amount back in presents, given to them as a remunera- tion for the service they render. A few receive even a fixed salary. Some of their princes also are married to a princess of the imperial blood, and thus are more closely attached to the interests of the emperor. By these means the court of Peking keeps the unruly and warlike tribes of that nation in subjection, in which it is principally supported by the indelible hatred which the Mongols bear to the Chinese. It is therefore probable that if the Chinese should rise in rebellion against the Mandchus, their present masters, the latter would be supported by all the Mongols in maintaining their present ground.

According to a rough estimate, it is thought that this nation, after having lived in peace for more than a century, can bring to the field 500,000 warriors; and as each male is a warrior, it is presumed that the whole population does not exceed three or two million souls.

(Timkowsky, Voyage à Peking, &c., Halais's Travels through Russia; Klaproth's Asia Polyglotta; Baunau's Narrative of an Embassy to China; L'Ecole's Narrative of a voyage to the Yellow Sea; Ritter's Erdkunde von Asien, i. and ii.)

MONGOLS AND TARTARS have been so constantly confounded by former writers, that even in modern times, although the vague denominations of Great Mongols and Tartars, for Tartar is dis speaking, still prevail, little confusion still prevails about the history and geography of these two nations, who are however distinguished from each other by a strongly-marked physical and moral character. The vast plateaus and plains of Central Asia or Tartary form the habitation of the Mongols, and the immemorial Mongol and Tartar, or, more properly speaking, Tur-
tribes. The last-mentioned people, whose number may be estimated at nearly three millions, are widely scattered, from the shores of the Caspian Sea to the Russian provinces of Kasan and Astrachan, and to the inhospitable tracts of Siberia, and even beyond that mountain range, the southern declivities of which are principally inhabited by the Turkmans, or those Turkic tribes from whom the European Turks, or Osmanlids, are descended. Some of the northern clans, and particularly those which are subject to the Russian government, have settled in towns and villages, and have engaged in trade, cattle-breeding, and agriculture. On the south side of Mount Caucasus numerous Tartar tribes, who trace back their origin to the earliest periods of human history, and with their flocks to the warmer regions of the plains, live alternately in tents and movable habitations; but the greater part of them resemble in many respects the Arabian Beduins, have no fixed residence, wander over an immense extent of country, and lead a roving pastoral life, being occasionally engaged in hostile excursions and predatory quarrels. Personally they are a noble and intrepid race, and though animated by fierce passions and addicted to plunder and robbery, they nevertheless carry on the duties of hospitality, and rarely shed blood, unless strongly provoked. (Leyden's learned Introduction to the Memoirs of Baber, London, 1826.) With the exception of the religion of Mohammed, there is no common tie among the many Tartar tribes which are distinguished by the Turkish denomination of hordes or encampments, such as the Nogai, Usbek, Kirgise, and Turkoman hordes. But they are all distinguished by the same striking features of the finely-formed and light-coloured horse, to which their national character, which the Mongols are characterised by a short stature, dark hair, yellow skin, robust and muscular, in which the Mongols are chiefly characterized. Another peculiarity is the exceeding studness of the horse, so dear to the Tatars, which is esteemed of all the nations of Asia; but it is to the restless hordes of middle Asia, and to the Buriats, Bashkirs, Kalmucks, and other roving tribes, that the name of Mongols is chiefly restricted. Although the Mongols, like the Tartars, are equally fond of horse and cattle-breeding with the Tatars, they wander in quest of pastureage over their boundless plains, carrying with them their whole stock of property, and even their houses, which are placed upon wheels and drawn by oxen. Thus they leave scarcely a trace of their former residence in the places which they abandon. Contending for temporary pasture-grounds, or compelled by urgent necessity, those innumerable crowds of Mongols, though not less warlike and cowardly, have often invaded the neighbouring countries. The Seychthians of old, who devastated, in the sixth century before Christ, the provinces of Media and Persia, even as far as the frontiers of Palestine, were undoubtedly Mongols (Herod. i. 103; iv. 35; Strab. xvi. 15; vit. 1; vii. 3), who afterwards, under the name of Huns and under the command of the fierce Attila, made considerable progress into Europe, ravaging the country like a host of hungry locusts, and conquering rather by their overwhelming numbers than by any regular warfare. (Ammianus Marcell. xxx. 2; Jornandes, De Rebus Goth., 35.) The Huns appear even on an antient Indian inscription (Asiatic Researches, i. 131); but the 'White Huns' mentioned by Cosmas Indicopleustes are probably Turki tribes, or those Seychthians (Sikah) whom King Vikramaditya expelled from India in the fifty-sixth year before our era. The distinctive names of Mongols and Tartars did not come into being until after the conquests of Genghis Khan, who honoured his Mongols with the pompous title of Koehna Mongkhol, or 'celestial people'; whereas the conquered Turkic hordes were called tributaries, or Tatars, as the word should be more correctly written. Although the main body of the soldiers, as well as the immediate successors of Genghis Khan, were de- cided Mongols, it is from that time that the name of the more courageous and spirited Tartars has been indiscriminately and arbitrarily applied to those Asiatic conquerors. (F. F. Schmidt, Forschungen im Gebiete der Geschichte der Mongolen, pp. 5, 39, 56.) Genghis Khan, born in 1163, be- came the chief of the Mongol clan in the thirteenth year of his age, and having first overcome the neighbouring hordes, he soon united the numerous wandering tribes into a conquering nation, and successively subdued the greatest part of Asia. His son Otkai followed him under

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the title of Great Khan, and was equally successful. In their expeditions to the west the Mongol armies, or, properly speaking, their hosts of robbers, advanced even to Hungary and Siberia; so that after the dreadful battle of Wahlstadt (A.D. 1241) the Mongol empire extended from the northern provinces of China to the frontiers of Poland and Germany. The Mongols (Khalkhas), under their khan Kublai, conquered all China, and remained in possession of that country for a century. In the course of the thirteenth century this vast empire gradually split into several independent sovereignties, till it was once more united, and even considerably enlarged in the direction of Hindustan, by that bloody conqueror of the Djangal Turki race, the famous Timur Begh, or Tamerlan, after whose brilliant career (1335-1405), the Mongol empire slowly dissolved. In the year 1519 a lineal descendant of Timur, Zehireddin Mo- hammed Baber, founded a new monarchy in Hindustan, erroneously called the Mogul empire. Being himself of Turkic origin, Baber not only wrote his interesting ' Memoirs' in the purest Turki dialect, but often censured in the strongest terms the depravity, perfidy, venal character, and cowardice of the Mongols. For the further history of the Mongol and Tartar tribes, see Abulghasr Behadurkhan, Historia Mongolorum et Tatarum, Cassn, 1823; Hümmlin, Geschichte der Mongolen, Berlin, 1796. MONGOOSE, or MONGOOZ, one of the names of a species of Macaco, Lemur Mongooz, Linn. MONIMIA/CE.E constitute a little-known natural order of plants, whose most striking distinction consists in the flowers being naked and collected together into involucres, some male and some female; the male involucres having their inner surface thickly covered with numerous stamens; the female including several carpels, each of which has a single ovule in its interior. The species are very few in number, and in all cases are South American woody plants, shrubs, or trees, with fragrant aromatic secretions. Their real affinity is unsettled; if the prevailing opinion as to their structure is correct, they must be regarded as near allies of Urticaceae; but if what is now called the involucres should be shown to be a calyx, as it was considered, till Brown suggested the contrary, they will take their station near Lauraceae, with which their aromatic qualities assimilate them.

Monimia rotundifolia.

1. a male involucro; 2, a female involucro; 3, the last cut open to show the carpels; 4, a ripe fruit; 5, a view of the ripe carpels contained in the latter, the involucrum being partly cut away.

MO/NITORS, the name given to some Lacertian Reptiles, in consequence of the supposed warning given by them 2 U S
of the vicinity of crocodiles. The warning of these Monitory Lizards was said to be a hissing or whistling; but the better opinion is, that they obtained credit for this monition solely from the accident of their haunts, which are for the most part in the neighbourhood of the waters, and consequently bring them sometimes into company with the destructive and gigantic reptiles above mentioned.

The Monitors have teeth in both jaws, but none on the palate. Cuvier divides them into two groups [lacert. aff.], and Fitzinger into three, under the names of Topinambis, Varanus, and Phasmotherianus. Mr. Gray makes the Monitoridae the second section of his Lepidoglossae, or Slender-tongued Lizards. (Zool. Proc., 1837.) The true Monitors are protected by small and numerous scales on the head, the limbs, under the belly, and round the tail, which is carinated above, the keel being formed by a double row of projecting scales. Thighs without any row of pores.

**Geographical Distribution. — The Old Continent.**

The Monitor of the Nile (Lacerta Niloticus, Linn., Topinambis Niloticus, Geoff., Owanur of the Arabs) will serve as an example of these Lizards.

**Description.** — The teeth of this species are conical and strong, and the posterior ones become rounded with age. The colour is brown, with paler and deeper dots, forming ocellated compartments, which become rings on the tail and obscure stripes on the limbs. The tail, which is rounded at its base, is carinated above, though not strongly, nearly throughout. Length from five to six feet.

**Locality.** — Egypt; where the modern Egyptians have a fable that the animal is a young crocodile which has been hatched on dry land — as indeed all young crocodiles are — but they mean, we suppose, to convey the idea that it is a dwindled and neglected offspring. The species is to be found on the monuments of the ancient Egyptians, probably on account of its devouring the eggs of the crocodile.

The great fossil Lizard [Megalosaurus] appears to have partaken of the structure of the Monitors and the Crocodiles. The Monosaurus was also very nearly allied to the Monitory Lizards [Megasaurus]. An account of the dissection, by Mr. Martin, of a Monitor that died at the Gardens of the Zoological Society in the Regent's Park, in 1831, will be found in the Proceedings of the Society for that year.

**MONK.** In England, before the Reformation, a person who entered and professed in religion, as the phrase was, from that time was considered, for all legal purposes, to be dead. Littleton (§ 260) says, 'When a man entereth into religion and is professed, he is dead in the law, and his son or next cousin (consanguineus) incontinent shall abjure him, as well as though he were dead indeed. And when he enthrone into religion, he may make his testament and his executors, and they may have due debts due to him before his entry into religion, or any other act that executors may have, as if he were dead indeed. And if that he make no executors when he enthrone into religion, then the ordinary may commit the administration of his goods to others, as if he were dead indeed.' But this legal definition of this legal notion of a civil death, that if a house was made to a man for the life of another person, and thus other person professed in religion, the lease determined; and this relation of a lease was always made for the natural life of any person or of the continuance, by which the life was to depend; and this phraseology is still maintained in legal instruments. (Co. 2, Rep. 48.)

All Regulars, that is, those who vowed obedience, chastity, and poverty, entered some house of religion as they professed. Bare admission into such a house was an entry into religion; but the person was not professed till the year of probation was expired, and he had taken the habit of his order and made the vows above mentioned.

**Locality.** — by the 27 Hen. VIII., c. 24, all almoners, provosts, and other religious houses of monks, canons, and nuns, of whatever habit, rule, or order, not having lands, rents, or other hereditaments above the value of 200l. per annum, and all their manors and lands, were given to the king and his heirs ever.

It is not considered that the king should enjoy, according to the act, the actual and real possession of such religious houses as were comprehended within it, and might give, grant, or dispose of them at will and pleasure, and in the honour of God and the king of the realm.

The act of the 31st Henry VIII., c. 13, was still more comprehensive. By the 1st Ed. VI., c. 14 (which receives the 37th Henry VIII., c. 4), all colleges, free chapels, and chancellories, and all manors, lands, or hereditaments belonging to them, on which had been given and the advancement of any priest, or of any anniversary or obit, or any light or lamp, to have continuance forever, were given to the king and his heirs and successors.

It should be observed that those acts did not affect ecclesiastical house of monasteries, abbeys, and priories; that is, they did not affect the secular clergy, such as archbishops, bishops, deans and chapters, prebendaries, archdeaconies, parsons, and vicars; but only the regular clergy. It was decided in the archbishop of Canterbury's case (Co. 2, Rep. 49), that no English religious houses, unless it was provable within the act of 31 Henry VIII. These acts however completely put an end to all the houses of regular clergy within the realm; and on the occasion of carrying into effect the statute of the 3rd and 4th Edward VI., a great many religious houses, and other charities which did not come within the provisions of the act were also suppressed. This act, says Strype, 'was soon after grossly abused, as the act in the former king's reign for dissolving religious houses was. For though the publick had then pretended that the lower poor (I hope) yet private men, in truth, had most of the benefit, and the king and commonwealth, the state of learning, and the condition of the poor, left as they were before or worse.' (Strype's Ecclesiastical Memoirs, ii. 101-103, 423, and c. 49, where there is a catalogue of King Edward's free grammar-schools, which were endowed for the most part out of the charity lands given to the king by the said act for this and other like purposes.)

**MONK.** Duke of Albemarle, second son of Sir Thomas Monk of Potheridge, in the parish of Morten, in Devonshire, was born on the 6th of December, 1660. His father's estate was much enfeebled, and his circumstances so distressed, that when Charles I. visited Plymouth to inspect the equipment of a Spanish expedition in 1642, he was afraid of joining the gentlemen of the county who were desirous of assembling round the king, on account of the menace of a creditor who threatened to arrest him. George Monk was despatched to offer the under-sheriff money to delay the execution of the warrant of apprehension, but he had accepted the money, promised what was asked, and a few days after, paid doubtless on the other side, caused Sir Thomas to be publicly arrested in the midst of the genteel society of the town. (Memoirs of Monk, by M. Guizot, translation, p. 5.) This circumstance had an immediate influence on young Monk's life; he dealt so violently with the treacherous under-sheriff, that it became prudent for him to leave England. Sir Richard Greenville
his relative, was on the point of sailing on a cruise before Cezir, and he embarked with him as a volunteer. Upon the failure of this expedition, he enlisted during the following year in the army of the Provençal prince of Arles, under the command of the Marquis de Rhié. Soon after his return from the Isles of Rhié he entered the service of Holland: 'Germany and the Low Countries were at this period the resort of those young Englishmen whose fortunes had been won in the profession of arms. He returned to England about the thirtieth year of his age, when the first Scotch war began, enlisted in the king's army, and obtained the rank of lieutenant-colonel in Lord Newport's regiment.' (Skinner's Life.) This regiment of taxes, in which he had served, was one of those, in which it was concluded, made discontented and disinclined to emigrate to Madagascar; but he abandoned the scheme, and was appointed colonel of Lord Leicester's troops sent to quell the Irish rebellion (1642). In the irregular warfare that followed he had considerable success, his power being augmented by the devoted attachment of his troops: there was not, it was said, a soldier ever so sick or so ill shod, who would not make an effort to follow George Monk. When the civil war began, the parliaments were recalled, and Monk, being suspected of favouring the parliament, was sent under a strong military guard to Bristol. Lord Hawley, the governor of the town, passed him on parole to the king; and the king, satisfied with his professions, permitted him to rejoin his regiment. In 1645 one of the parliaments of England, in the siege of Nantwich. At Nantwich he was defeated by Fairfax (January, 1644), was taken prisoner, and, after some delay, confined in the Tower of London. During the two years that he suffered the extremities of imprisonment, events pursued their course: the king became a prisoner, and the civil war ceased. His known abilities made him now desirable as a parson. The parliament actively strove to gain him, and at length, overcome by promises and gifts of money (Clarendon, vii. 362), he forsook his party, which was no longer in a condition in which he could serve it, and 'quitted his prison to serve the parliament, leaving in the Tower the royalists, his companions in adversity, who never ceased to flatter themselves that they would improve one day useful to the king in England.' (Guizot, 39.)

Monk was now sent to Ireland to command in Ulster, where he served his new masters greatly to their satisfaction, leaving only one cause for censure, a league with the rebel O'Neill. He had gained the confidence of Cromwell, who determined, on account of his military talents, to make him general of the ordnance, and to provide him a regiment with which he might accompany him in the meditated Scottish campaign. In this service Monk distinguished himself at Dunbar, and was left by Cromwell with 6000 men to complete the reduction of Scotland. It is in this campaign that he is accused of having in cold blood put to death the governor of Dundee and 800 of the garrison. After a short residence at Dunbarton, he marched with the parliaments' forces across the Forth to Scotland (1652) with other Commissioners to promote the union of the two nations. Fresh and novel services were soon required of him. He was associated with Blake and Dean in the command of the fleet which was engaged in the war against Holland. Two engagements took place, in both of which the English were victorious: Van Tromp, the Dutch admiral, was killed, and his fleet damaged and dispersed. After being rewarded with many honours at the hands of Cromwell and of the parliament, he resumed the command in Scotland, where fresh troubles had broken out.

Before we proceed further with the account of Monk's public acts we must mention some occurrences in his private history, by which his condition was considerably affected. These are, the death of his father, which occurred before his imprisonment; the subsequent death of his elder brother without male heirs; his succession to the family estates, which he so soon relieved by the fortune described in the last event took place is difficult to ascertain, but it was not acknowledged until 1653, though asserted to have been previously solemnised. His wife was Anne Clarges, the sister of Dr. Thomas Clarges, a physician, who also died, and left him with his daughter. 'She was a woman,' says Lord Clarendon (who must however be pointed out as Monk's assiduous detractor), 'Nihil melius praebere corpus generis; a person of the lowest extraction, without either wit or beauty.' (Hist. Engl. vii. 385.) The pressing solicitations of the lady, and the probable or actual birth of a child, gained Monk's consent to the union.

It was in April, 1654, after all these circumstances connected with his private affairs had taken place, that Monk, under the orders of the Protector, marched northwards with the most restless and fanatical portion of the army. He had to contend with Lord Middleton, with whom the royalists had taken refuge in the Highlands, and the people generally, who were discontented and ready for rebellion. His vigilance and activity were remarkable.

'The country submitted; the army did not quit it, till it had, by means of a certain number of garrisons, secured the country.' From the Highlands they proceeded to Scotland, where they could refuse with impunity; and order was established in those strongholds of plunder, with such effect, that the owner of a strayed horse, it is said, recovered it in the country by means of a crier.' (Guizot, p. 80.) In the autumn he returned to Edinburgh. For five years his residence was at Dalkeith, where he was 'ever engaged in business, or in his planting, which he loved as an amusement and occupation; he gave access to every one; listened to everything; had a language for all conditions, all ranks, and all parties; kept himself well informed on all subjects; and ascertaining what he might have to fear or to promote, directed by his own personal knowledge the numerous spies whose reports never missed his ears or hands.' Monk, who was thus admitted into the intimacy of the Protector, was now proclaimed Protector in Scotland, and established upon Scotland, now stood in a very curious position: for though he was the agent and confidant of Cromwell, he was also the hope and favourite of the royalists. It was always his care in advocating the cause of one party to give as little offence as possible to that to which he did not commit himself, he was silent when speaking was not absolutely necessary; when he was forced to speak, he did so with caution and artful duplicity. A letter which the king wrote to him expressed his confidence, Monk forwarded to Cromwell; but notwithstanding this apparent devotion, the Protector feared him, and used various expedients for neutralising his power. (Guizot, translator's note, p. 91.) After Oliver Cromwell's death, when Richard Cromwell was proclaimed Protector, Monk declared himself 'in adhesion to Monk, 'Why not rather 'Old George?'" but Monk would neither assume the power nor attach himself to any party. The new Protector's friends offered him 20,000l. a year for his support; but, avaricious as he was, he would make no engagement; his answer was to render himself an object of importance to all parties, and through his duplicity he succeeded in being treated with by all. When at length circumstances compelled him to act, he declared himself truly horrid; in the highest moment of the armistice, he marched to London. There were many, even at the time when he thus declared himself, who altogether discredited his sincerity, and believed him to be at heart a royalist, seeking to restore the king as soon as it might be done with least danger to supporters of the new order. He was determined to promote the Restoration. We give Mr. Hal- lam's opinion on this point. (Const. Hist., ii. 384.)

' I incline, upon the whole, to believe that Monk, not accustomed to respect the Rump parliament, and incapable, both by his temperament and by the course of his life, of any enthusiasm for the name of liberty, had satisfied himself as to the expediency of the king's restoration from the time that the Cromwells had sunk below his power to assat them; though his projects were still on a large scale, and by no means calculated to give security, which he was resolved not to forfeit by any premature declaration or unsuccessful enterprise.' The power of Lambert and the army was now rapidly demolished. Fairfax, the city of London, the fleet, and the governor of Portsmouth, all declared against them, and Monk's party gained the ascendency in Ireland. Every office and every command Monk filled with friends whom he could trust; it was observed that many of these persons were royalists, yet Monk still persisted in professing himself a commonwealthman. The expectation of the Restoration was somewhat general, but, if there were any, the number was small who suspected through whose agency it would be brought to pass.

When Monk arrived in London he was lodged in the apartments of the prince of Wales. He addressed the parliament, was invited to occupy his place there, was made a member of the council of state, and charged with the executive power. With his usual address, he continued to use the power of his army as a means of swelling parliament,
and the assertion of duty owed to the parliament as a means of controlling his army. At length the 'Rump' became so unpopular, and the cries for a free parliament so loud, that the city of London refused the payment of taxes. Monk obeyed an order from the parliament to march into the city and subdue it: but his subervience to them did not last long. He sent them a letter, 'probably the hardest ever received by that parliament, so used to insults' (Guizot, 203), ordering them immediately to fill up the vacant seats, restore the bishops, and dissolve parliament by 6th of June 1653, before the election of a new and free parliament. The restored members appointed him general of the forces of England, Scotland, and Ireland; and the republicans, as a last resource, listened to his continuing protestations again the king, and sent him a commission, and the king allowed them to him. Every day his personal power increased; he was offered the protectorate, which he declined; continuing the line of conduct he had always followed, 'that is to say, steadfast in varying his language according to the individual—he gave no handle to any definite opinions with respect to himself'. The expectation of the Restoration daily increased, and some indications in the conduct of Monk, who was gradually dismissing persons and removing objects that might render him subervient to the king, showed plainly that the event was not far distant.

At length the forces was brought to a close. Monk received Sir John Greenville, the king's messenger, and having read the despatches, and agreed to his return, directed the king to write a letter to that effect, which he did. On the 24th of May, he sent a letter to the king, by Monk's advice, went from Brussels to Breda, and Sir John Greenville, on the 1st of May, returned with letters to the new parliament drawn up as Monk desired, and the king was unconditionally acknowledged and proclaimed king. On the 23rd of May, Monk received him on the beach at Dover, was embraced by him, and addressed with great affection. He had a grant of money, together with many offices and titles, of which the principal was the dukedom of Albemarle (293).

After the restoration, Monk resided principally in London, with his wife, who was the laughing-stock of the court, and gave general disgrace. (Pepys, i, 35, &c.) In 1664 Monk presided at the Admiralty. In 1666, when, on account of the plague, the left London, he bought there a great deal of ground and quelled all confusion. In 1666 he commanded the fleet with Prince Rupert, engaged the Dutch, and gained credit for his courage. On his return his health failed, and he died of dropsy on the 3rd of January, 1667. He was buried in Westminster Abbey, in Henry VII's chapel; the king attended the funeral. He was succeeded in his titles by Christopher his son, who married Lady Isham, the granddaughter of the duke of Newcastle, and died childless.

Monk had considerable capacity for civil as well as military government: the father he proved in Scotland, the latter in all his campaigns. He had the faculty of gaining the good-will and confidence of the troops and sailors that he commanded, with whom no man was more popular than 'Old George.' He had a remarkable power of advancing his fortunes with the prevailing party, without giving offence to those that might supplant them. He was silent and cautious, shrewd and philosophic; he was profusely skilled in dissimulation, over dissembling, treacherous, and false. 'He was a man capable of great things,' says M. Guizot, 'though he had no greatness of soul.'

MONKEY, the name usually applied to those forms among the Simidae which possess a tail.

The town of [Cromwell II. James II.]

MONMOUTH, the capital town of the county of the same name, is situated at the confluence of the Wye and Monnow, in the hundred of Skenfrith, about 125 miles west-north-west of London. The population amounted in 1831 to 3,051.

The town is comprehended in the parish of St. Mary's, from which a portion called St. Thomas's has of late years been separated for ecclesiastical purposes, and appropriated to the use of that name.

From the coincidence of the position of Monmouth with that called 'Blæstim' in the ancient Itineraries, it is generally supposed to be the site of that station. From historical record it appears that Monmouth in early times was occupied by the Saxons, who fortified it to maintain their conquests between the Severn and the Wye, and to prevent the incursions of the Welsh. The town has been surrounded by walls and a moat on the sides which are partly protected by the river; four gates, the most, and portions of the walls existed in Leland's time; one gate still remains; the walls have been entirely demolished, and only a small part of the moat can be traced. The ruins of the castle, which is mentioned by our most accurate and trustworthy writers, are still visible, and the site is occupied by the modern town.

It is said by Camden to have been constructed by John of Monmouth, in the reign of Henry III, which may be an error. The castle was, however, given in Domesday Book, a castle at Monmouth is mentioned to have been then held for the king by William Fitz Baderon. A list of the successive proprietors is given by Mr. Coxe (Hist. Mon., p. 302); it was the favourite residence of John of Gaunt, of his son Henry Bolingbroke, and afterwards Henry IV; and the birth-place of Henry V, who was thence called Harry of Monmouth. The castle of Monmouth, as a parcel of the duchy of Lancaster, was inherited by Henry VI. Edward IV, in the fifth year of his reign, restored it to William Holland. The castle afterwards became the earl of Pembroke; but it again reverted to the crown, and was possessed by Henry VII and several of his successors. At what time it was alienated from the duchy of Lancaster and became private property has not been determined. The duke of Beaufort is the present proprietor.

The borough is divided into the following wards: Castle Bailey, Wye-bridge, Monnow Street, and Over Abbey. The bulk of the population resides within the limits. There are four charters of incorporation, all of which are considered as governing charters. They were granted—the first by Edward VI, in 1550; the second by Philip and Mary, in 1557; the third by James I, in 1604; and the fourth by Charles II, in 1660. The mayor and capital burgesses are the governing body; the mayor, treasurer, and recorder are magistrates for the borough.

The market is held every Saturday and the first Wednesday in each month; and there are four annual fairs; the chief, which is held in May, is for the manufacture carried on here. Formerly Monmouth was celebrated for its caps, which were worn by a large portion of the population of England and Wales. Fuller, in his "Worthies," gives an account both of the caps and the persons and circumstances in making them. Statutes were framed for the protection and encouragement of this handicraft; in the 13th of Eliz. it was enacted that these caps should be worn on state occasions and holidays by all persons (some of worship and quality excepted) at the expense of fifty or a hundred pounds, and mentions this article of clothing. In Henry V (act iv. sc. 4.) Fluellen says, 'The Welshmen did goot service, in a garden where leeks did grow, wearing leeks in their Montmouth caps.' An inn called the Monmouth Cap stands on the borders of the county, halfway between Abergavenny and Hereford.

MONMOUTHSHIRE, a maritime English county, bordering on South Wales, is bounded on the north by Herefordshire, from which it is for the most part separated by the river Monnow; on the east by Gloucestershire; and the river Wye; on the south by the Bristol Channel and the estuary of the rivers Severn and Wye; on the west by the Brecon and Radnor; on the north-west by the Black Mountains, divided by the river Runney. The parish of Bicknor, a detached portion of this county, bounded by Herefordshire and the river Wye, is situated north-west of Monmouth, between that town and Ross.

Its greatest breadth north and south is about twenty-eight miles. Its greatest length east and west is about thirty-four miles, or 310 square miles, or 204,741 acres. The gross population amounted to 98,130, being an average of about 198 persons to a square mile; on comparing the amount with the similar average in each of the counties into which the county is divided, with one exception, the population of Monmouthshire is the least dense. The population of Gloucestershire is about 307 to a square mile, Herefordshire 122, Glamorganshire 160, and Brecknockshire 63.
In extent of surface Monmouthshire is exceeded by thirty-five English and seven Welsh counties; in amount of population by thirty-six counties in England and none in Wales.

Surface.—With the exception of the southern portion, Monmouthshire is generally a hilly country. In the hundred of Wentloog a long chain, commencing with Bedwellty mountain, runs nearly unbroken to the Curtain mountain in the parish of Machen. In the same hundred is Mynd-y-Lian, and a second range of hills immediately to the west of the river Ebbw. In the hundred of Abergavenny are the Blrgyn, the picturesque Skyrred and Sugar-loaf, a portion of the Black Rock, and the northernmost parishes of Aberystwith and Llanilithel, and to the west and north of Pontypool. The Graig forms the principal height in the hundred of Skennith. These are the chief though by no means the only elevations; as we have before said, a large portion of the county is irregularly hilly: the southern district must be excepted. In Caldicot and Wentloog are large tracts of land called the 'Levels' of the hundreds in which they are situated, varying from place to place in appearance and products, and thus protected from the roads of the sea by mounds or stone walls of many miles in length. From Caldicot Level rises the hill of Goldcliff, for an account of which we refer to the [Archaeologia, vol. v., p. 61.]

The length of the coast-line from the mouth of the Wye to the Severn is about 20 miles; a portion of this length bounds the estuary of the Severn, and the rest the Bristol Channel.

Rivers.—The principal rivers in this county are the Wye, the Usk, the Rumney, the Ebbw, and the Monnow.

The line drawn from the detached portion, the parish of Walshicknor, of which it forms the western and southern boundary, thence it flows a circuitous course between the counties of Hereford and Gloucester, until it reaches Hafnock Wood, in the parish of English Newton, where it divides the parish into two parts; to the north of which is the Bryn, and to the south of which is the Wye. This river is navigable for barges, and sea-going vessels of considerable size work their way up the bridge at Chepstow, whence steam-packets also ply to Bristol. The tide, which rushes with great impetuosity through the narrows, is one of the strongest in the kingdom; and after it leaves the road leaves the river at some distance from the town.

The Usk enters Monmouthshire about three miles west of Abergavenny, flows in the vicinity of that town, thence through the middle of the county by the towns of Usk, Caerleon, and Newport, where is the lowest bridge, until it reaches the Bristol Channel.

The Monnow becomes the boundary of Monmouthshire that is most frequently visited by tourists; and the whole extent from Monmouth to Chepstow, whether from the water itself or from the approach, which follows the course of the river, is a landscape of very remarkable beauty. The abbey of Tintern, the view from the Windcliff, and the approach to Chepstow, are the most striking features; the last is particularly fine. From the heights by the road from the Usk to Monmouth, the road leaves the river at some distance from the town.

Agriculture.—The agriculture of this county varies according to the districts. In the mountainous portion on the north-west little wheat is grown; oats and barley form the principal grain crops. The Glamorganshire breed of cattle and small full sheep prevail; the system of farming being very similar to that generally practised in the hilly parts of South Wales.

In the fertile vale of Usk, the vale of Wye, and the northern and eastern districts generally, the agriculture is very similar to that of Herefordshire. Short-horned cattle have been introduced at Tredgar by Sir Charles Morgan, but they have not extended widely, and the Herefordshire breed is prevalent. Orchards are seen in favourable situations; the hills are also frequently covered with oak coppice. The southern district, bordering the Bristol Channel, consists of an alluvial tract, in which three qualities of soil are found, a black and sterile peat, and a light and a heavier clayey loam; the lightest of these soils is productive either as pasture or meadow or under tillage.

Political Division. The county is divided into the following hundreds: Abergavenny, Caldicot, Raglan, Skennith, Usk, and Wentloog: which contain 123 parishes, and eight market-towns. 1. Abergavenny is situated in the hundred of the same name, near the beginning of the Usk, in the northern portion of the county. It is distant from London 145 miles, from Monmouth 16, and from Hereford 24. The market, which is considerable on account of the neighbourhood iron and coal works, is held on Tuesday and Saturday. [Abergavenny.] 2. Caerleon, in the south
of the hundred of Usk, stands upon the right bank of the river, from which that hundred takes its name, about five miles north-east of Newport. In consequence of its neighbourhood to the thriving port of Newport, its trade has diminished, and the place become of little importance. The market, which is inconsiderable, is held on Thursday. 3. Chepstow is beautifully situated in the hundred of Calecot, near the mouth of the Wye, and is distant from London 133 miles, from Newport 16, and from Monmouth 16. [CHEPSTOW.] 4. Monmouth. Newport holds an important situation near the mouth of the Usk, in the hundred of Wentloog. In association with the boroughs of Monmouth and Usk, it forms one of the representative counties. The governing charter was granted in the twenty-first year of James I.; the mayor and thirteen aldermen form the governing body; of the aldermen, who are elected for life, the two with the highest salaries for the borough. The limits of the borough, which formerly did not comprise the whole mass of the population, were extended at the time of the Reform Act. The town is well lighted and supplied with water, but indifferently paved and cleansed. It was once surrounded by walls, of which no vestiges remain. Three gates are mentioned by Leland to have existed in his time; the sites of two of these may still be traced. The castle, the remains of which have been converted into a brewery, was probably built by Robert, Earl of Gloucester and Bridport, in the time of Henry II. (1154) (see Ch. 5, p. 50.) During the present century this town has progressively and rapidly increased in wealth and population. The population of Newport and St. Woolos was, in 1831, males, 3562; females, 3562; total, 7124. The port of Newport comprises the whole of the river Usk between Caerleon and a line drawn from Redwick Pill on the Severn, to the mouth of the Rumney river. The port dues are, for every sloop under 20 tons, 4d.; for every vessel over 20 tons, 6d.; for a schooner or brig, 1s.; for a ship or bark, 3s. The exports consist principally of coal, iron, bark, and oak timber; the importations of foreign timber and Irish provision. The number of vessels engaged in foreign, coasting, and Irish trade in 1833 amounts to one-fifth of the total engaged in the coasting trade. The export of coals, which in 1800 was 18,735 tons, in 1833 amounted to 470,339 tons. The following table shows the amount of trade carried on in this port.

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<th>Year</th>
<th>Vessels cleared in.</th>
<th>Vessels cleared out.</th>
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<td>1825</td>
<td>910</td>
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<td>1832</td>
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<td>1834</td>
<td>1339</td>
<td>7492</td>
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The gross amount of customs-duty received in 1834 was £5784; in 1835, £6709; in 1836, £11837.

Much inconvenience has hitherto been experienced on account of the insufficient accommodation of this port; vessels are sometimes obliged to lie at anchor for want of space in the road and harbor. A considerable improvement, lately (1838) been formed for the purpose of building docks, which will tend to facilitate and increase trade. Newport is distant from London 149 miles, from Chepstow 16, and from Cardiff 12. Markets are held on Wednesday and Saturday.

Pontypool, a thriving town on the southern border of the hundred of Abergavenny, stands upon the Afon Llwyd, immediately to the east of the wild mountainous district in which many of the principal collieries and iron-works are situated. Pontypool is distant from Usk 7 miles, from Newport 9, and from London 140. The market is on Saturday. 7. Tredegar is situated in the parish of Beddvery, in the upper division of the hundred of Wentloog. The activity of the neighbouring mining district has caused so rapid an increase of the population, that it has been found desirable to erect a market-house here, and to hold a market every Saturday. Many houses have lately been built, and a town formed here; there is a church, and places of worship for Wesleyan and Quakers. Tredegar is 21 miles from Newport and 12 miles from Abergavenny. 8. Usk is situated in the hundred and on the river of the same name; it is a borough, contributing with Monmouth and Newport to the election of a member of parliament. The lord of the manor of Usk holds the right of riding the assize, which capacity he appoints the recorder. There are within the borough a portreeve (nominated and elected annually by the burgesses), a recorder, two bailiffs, and an indefinite number of burgesses. Usk is distant from Monmouth 12 miles, and from London 141 miles.

Caeerwent, a Roman station of considerable importance, and afterwards a town, has now become an inconsiderable village. Its site is within the parish of Usk, and the amount of its antiquities as are worth of notice is given in the Archæologia, and in Coxe's Monmouthshire, vol. i. p. 34.

Minerals and Mining Industry. — The important minerals in this county are coal, limestone, and iron-stone. The coal is generally called, occupies a western portion of this county.

There are 12 beds of coal, varying from three to nine feet thick, and whose aggregate thickness is about 95 feet; the principal strata lies at a considerable depth, but as the coal-field is large, and the strata, in consequence of the striking shafts is avoided, levels being driven into the side of the hills. These levels form the ingress and egress to the mines, and are furnished with iron-roads for greater facility of transit. The coal may be divided into two classes, viz. furnace coal and stone-coal. For an analysis of them, and general information respecting this coal-field, see Coal. Limestone, which skirts the coal-field, and is likewise found, as we have stated in our remarks on the geology of this county, in the neighbourhood of Chepstow, is extensively used for building purposes and manure, and is used in large quantities in the manufacture of iron. Being broken into small pieces, that it may mix more intimately with the mine and coke, it becomes a flux, combines with the clayey portion of the ore, and when burnt for some time in a bag or cinder. In the selection of limestone for this purpose, those beds are preferred which contain the smallest proportion of magnesia. It is reckoned that about a ton of limestone is required for the manufacture of iron.

The iron-stone of this district is an argillaceous one, occurring sometimes in strata, sometimes in detached bums or balls; the proportion of iron contained in it varies from 18 to 25 per cent. : from 30 to 35 per cent. may be considered not a bad average throughout the的工作. Carboniferous and clay enter largely into the composition of the ore; and water, sulphur, silica, and perhaps a little arsenic, complete the list of ingredients. The iron-works of Monmouthshire and South Wales are comprised in a range of country of about 25 miles, extending from Newport in the direction of southwest, and in the direction of north-west and south-east. The works at Hirwain in Breconshire, and Aberdare in Glamorganshire, form the extreme points to the westward. This comes Merchy Tidral with its important works after the are, as it were, of the manufacture; and from Merthyr there is a continued line of furnaces formed by the works at Dowlais, Newport, Tredegar, Howey, Beaufort, Newtown-Glas, Bishton, the Vartist, Abersychan, and Pontypool, which is estimated to be a considerable number of forges, and to contribute, according to the demand for iron at this time (1839), that all available furnaces are in blast, and many new ones in course of erection. Under the head Irons will be found an account of the iron manufactured by Monmouthshire and South Wales; and a more detailed account of the Furnaces of Monmouthshire, of Useful Knowledge, entitled 'Manufacture of Iron,' from which these remarks have been extracted. See also a prose Essay On the Mineral Basin of South Wales, by Mr. Boss (London, and Cardiff).

Political and Ecclesiastical Divisions. — Monmouthshire is divided into four doyens, Abergavenny, Newport, Neberwent, Newport, and Usk. It is in the province of Canterbury, and, with the exception of four parishes, in the diocese of Llandaff. The parishes of St. Mary's, Monmouth, is in the diocese of Hereford; those of Cymwug, Oldcastle, and Llanthony, in the diocese of St. David's. The benefices are generally of very small value, the greater proportion producing annually less than 120£; the principal are
The churches are generally very small and frequently of Norman architecture, of which Malpas offers a good specimen.

Two members of parliament are returned for the county; the polling-places are, Monmouth, Abergavenny, Usk, Newport, and the Rock Inn in the Parish of Bedwyn. Both elections are held at Monmouth by the judges of the Oxford circuit, having a route from Hereford to Gloucester. The quarter-sessions are held alternately at Monmouth and at Usk. Poor-law Unions have been formed, and workhouses altered or extended. The principal towns are Chepstow, Monmouth, English, Monmouth, and Pontypool. The principal gentlemen's residences are Tredgan, Llanover, Troy, Pontypool Park, Pearcefield, Llantrillo Cressenny, Clytha, Llanwern, Coldbrook, and Llanvihangel Crucowy, a gloomy but beautiful place, having one broad avenue of old Scotch firs in front, and a second of very fine Spanish chestnuts at the back, with the Skyrrid, whence the prospect is magnificent, rising, as it were, out of the grounds.

Hist. and Antiquities.—Monmouthshire at the time of the Roman invasion was occupied by the Silures, who made the then important town of Caerwent their capital. The Silures remained unmolested by the Romans until England was subdued, and successfully resisted their arms under the reign of Tiberius, when they submitted to the Emperor; July 30th, from this time the Romans occupied their country, until a.D. 405, a period of 330 years. The history of this district during a period immediately subsequent to the departure of the Romans is uncertain and obscure; in the Silures, who were an agricultural people, the scene, its sovereigns Uther Pendragon and Arthur [Arthur] are marvellously extolled, and Caerleon is mentioned as a place of great splendour and importance. During the establishment of the Heptarchy, the Saxons and Angles took the Silures and were continually in conflict. The Saxons drove back their adversaries and confined them within the narrower limits which now form the boundaries of Wales and Monmouthshire, and compelled them to pay tribute. Wales was now divided into three parts as far as Beverley and Caerleon, Newport, New-shire, and Monmouthshire, once within the limits of Deheubarth, afterwards divided at some times separate districts under the names of Gwen, at others was comprehended in Morganw, or the kingdom of Glamorgan. The petty princes who shared the power of Glamorgan were generally tributary to the kings of Glamorgan, but withheld their tribute whenever these kings were not in a condition to enforce the payment. Occasionally they aimed at independence; a savage attempt to have been induced to search for their pasture. They were also bold enough to resist the English kings. Alfred, we find, made preparations to subdue Caerleon, and Canute entered Gwent in 1043, and defeated the prince of South Wales. It is a subject of dispute whether Monmouthshire was ever inhabited by the Normans, for the Normans occupied Monmouth, Chepstow, and Caerleon, and Harold built a castle at Portishead, it may be conceived that, if the whole district was not actually in their power, it could not have failed to have been speedily overcome. The Normans, after their invasion of England, could spare no troops for the conquest of Wales; they therefore invited the barons to make incursions at their own expense, and rewarded them with the gift of the lands which they subdue. They held these lands by feudal tenure under the enfeoffment of the abbey remaining the same as a basis for their followers. The sites of about 25 castles have been traced in Monmouthshire alone. These lands, says Ernere, 'being helden, per baroniam, with full power to ad- minister justice unto their tenants, were invested with diverse tenures, and the baronial right of suit andizable courts were current among them. But in case of strife between two barons' marches, concerning their territories or confines, for want of a high court, the baron of one hundred miles, suit and justice was administered to them in the superior courts of the realm.' Such was the wretched state of feudal jurisdiction in Monmouthshire, as well as in the other marches of Wales, till Henry VIII., in the 37th year of his reign, abolished the government of the lords marches divided Wales into twelve shires, and annexed Monmouthshire to England. Monmouthshire however was not wholly freed from the dominion of the Welsh until a later period of our history; it was not annexed to the Ox- ford circuit until the reign of Charles II., and remained partly under the authority of the lords marchers' court, which was not finally abolished until 1707.

The following are among the most important historical events which took place in the county of which we treat.

Henry II. seized and garrisoned the town and castle of Caerleon, in his progress to Ireland, in 1171. In a subsequent year it was wrested from him by John the Great. Henry III. made two expeditions against the castle of Grosmaunt, which had in earlier times belonged to the families of Breos and Cantlupe: having taken it, he converted it to Hubert de Burgh, but again seized it, and afterwards annexed it to his dominions. Such an event as this, however, never happened at Usk and Grosmaunt in 1405. There is a tradition that this chieftain, after he was subdued, disguised himself as a shepherd, assumed the name of John of Kent, resided with his daughter married into the antient family of Scudamore of Kentchurch, about a mile distant from Grosmaunt, that he died here, and was buried in Grosmaunt church. Usk Castle was frequently an object of attack, and the town and country surrounding it was many times laid waste. After the death of Castell, Chepstow Castle was considered an important fortress during the Rebellion: the king retained it till 1645; it was then taken and retaken; afterwards Cromwell marched against it in person, and compelled a surrender. Martin the regicide, after a contest of two years, finally died here, and was buried with great honours. Raglan Castle, after a long resistance, was surrendered to Sir Thomas Fairfax, who besieged it in person in 1646.

The importance of the position of Monmouthshire has caused its occurrence in all early periods to fortify it to the best of their power. We find consequently many Roman encampments, and castles of different dates of architecture. The encampments, which are very numerous, have been laid down by Mr. Coke on the map published with his history; they are dispersed pretty generally over the country, but are more frequent in the neighbourhood of Newport than in other parts. Two Roman roads traversed this county: the Via Julia, extending from the mouth of the Severn to Caerleon, and Clunford, running eastwards from Caerwent over the rivers Wye and Severn to Cirencester. The stations which antiquaries have acknowledged to be Roman are, Isca Silurum (Caerleon), Venta Silurum (Caerwent), and Goban- tium (Abergavenny), and they may have been extensive or complete: — Abergavenny, Caerleon, Caerlcleod, Castel Gils, Chepstow, Dinham, Grosmont, Llanfair, Llangibby, Llan- vaches, Llaniar, Monmouth, Newport, Pencoed, Penhow, Raglan, Skenfrith, St. Briavelis, Usk, and Breamore. Very ancient dwelling-houses are seen at St. Pierre, Moin's Court, Pencoed, Machen, Werndee, and Trewon. St. Julians, now altered, was formerly the residence of Lord Herbert of Cherbury.

The principal ecclesiastical antiquities of this country are Tintern and Lanthony abbeys. The well-known ruins of Tintern Abbey are situated on the right bank of the Wye, about nine miles below Monmouth. The roof and tower of the building have fallen, but the greater part of the rest of the abbey remains, and may have been extended by various periods of restoration. The date of the abbey is uncertain, and the abbey was founded for Cistercian monks, by Walter de Chere, and received its charter from St. Louis. The foundation of the church was commenced by Roger de Bigod, earl of Norfolk; the abbots and monks first celebrated mass within it in 1261. The site was granted in the 28th of Henry VIII., to Sir John Worsley, who held it for a time under a lease from the property of the duke of Beaufort. Lanthony Abbey stands at the foot of the Black Mountain, in the Vale of Ewias, a portion of the northern promontory of the hundred of Abergavenny. The abbey, built like a cathedral, was in the shape of a cross, and, though of small dimensions, was well proportioned. The building is of the twelfth century, an earlier date than that of Tintern, and in a style of transition from Norman to early English architec- ture. Through neglect only a small portion of the build-
Abergavenny. A priory, which remained until the general suppression.

Basaile. A Benedictine priory.

Caerleon. A Cistercian abbey and monks.

Goldcliff. A priory, founded in 1113, and afterwards united to Tewkesbury. It was granted to Eton College in the 29th of Henry VI. The college was deprived of it, but subsequently regained possession.

Gracelieu. A small Cistercian abbey.

St. Wynemark or Kinnersley. A priory, in existence before A.D. 1291.

Llanwyk, or Llangi. Near Grossmont, a cell of Black Monks, subordinate to the abbey of Llavor, in Anglesey.

Llandarmon. A Cistercian abbey.

Malpas. Near Caerleon, a cell of Clunian Monks, to the priory of Montacute, in Somerset.

Monmouth. A priory of Black Monks, who came from Anjou in the reign of Henry I.; also two hospitals, one dedicated to St. John, the other to the Holy Trinity.

Newport. Situated 'by the key beneath the bridge' was a house, probably of Friars Preachers, for such was granted to the 35th of Henry VIII.

Strigil. An alien priory of Benedictines to the Abbey of Cornelle, in Normandy.

Usk. An old hospital and a priory.

About two miles south of Chepstow may be seen the remains of Mathern, formerly the episcopal residence of bishops of Llandaff. The palace, now converted into a farm-house, was built by different bishops in the fifteenth and sixteenth centuries. The last bishop who resided in it died in 1706. Three ruditudinal stones of considerable size are standing near the village of Trelech, and several may be seen in that vicinity.

Corporation and Boundary Reports: Conway, Flint; Monmouth, Monmouth; manufactures of Iron; Archery; etc.

The Welsh language still prevails in the hilly districts bordering on Brecknock and Glamorganshire.

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**STATISTICS.**

Population. Monmouthshire is chiefly a mining country and the extensive workings carried on for obtaining valuable products of iron and coal have produced a remarkable increase of population in the south-west part of the county since the commencement of the present century. The parishes of Abergavenny, St. Woolos Newport, Monmouth, Chepstow, and Bedwellty, which contained less than ten inhabitants in 1801, were, in 1831, reckoned to contain 21,606; of these the male inhabitants are chiefly employed in the pits and mines, and in removing the coal and iron ore. The process of forging the iron and otherwise preparing it for further purposes had, in 1831, created manufacturers to the number of 2,000 at Trethelah and Portgool, at Up-up, and elsewhere. The last census, 1825, showed Monmouth 80, and 50 or 60 in other places. The preparation of tin employs 300 men at Panteague, Lower Llanbrech, and Ringerstone. Iron-wire is manufactured at Castle Hill by 60 men; the preparation of colours from lead at Crick, and the manufacture of lead smelting 76 men at Morley, and the manufacture of japanned tin is not quite extinct at Usk.

Of 26,910 males twenty years of age and upwards, 3,359 are employed in the manufactures specified above; 7,647 are engaged in agricultural pursuits, and 7,173 are employed as labourers in labour not agricultural. In 1811 Monmouthshire ranked the nineteenth in the list of agricultural counties, but in 1831 it was as low down as the thirty-first.

The following table exhibits a summary of the population, &c., of every hundred, as taken in 1831.

<table>
<thead>
<tr>
<th>HUNDREDS</th>
<th>HOUSES</th>
<th>OCCUPATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>----------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>Abergavenny</td>
<td>5,815</td>
<td>6,057</td>
</tr>
<tr>
<td>Calderot</td>
<td>2,222</td>
<td>2,393</td>
</tr>
<tr>
<td>Ragland</td>
<td>1,575</td>
<td>1,632</td>
</tr>
<tr>
<td>Skinfreth</td>
<td>815</td>
<td>877</td>
</tr>
<tr>
<td>Usk.</td>
<td>1,663</td>
<td>2,004</td>
</tr>
<tr>
<td>Wentloog</td>
<td>5,427</td>
<td>5,764</td>
</tr>
<tr>
<td>Monmouth</td>
<td>894</td>
<td>1,164</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>18,612</td>
<td>19,911</td>
</tr>
</tbody>
</table>

The population of Monmouthshire, at each of the four following periods, was:

<table>
<thead>
<tr>
<th>Period</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
<th>Inc. per cent.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1801</td>
<td>22,173</td>
<td>23,409</td>
<td>45,582</td>
<td></td>
</tr>
<tr>
<td>1811</td>
<td>36,987</td>
<td>31,140</td>
<td>68,127</td>
<td>36.2%</td>
</tr>
<tr>
<td>1821</td>
<td>37,278</td>
<td>35,555</td>
<td>72,833</td>
<td>15.62</td>
</tr>
<tr>
<td>1831</td>
<td>51,095</td>
<td>47,035</td>
<td>98,130</td>
<td>36.0%</td>
</tr>
</tbody>
</table>

showing an increase between the first and last periods of 52,348, or more than 115 per cent. on the whole population, being 58 per cent. beyond the whole rate of increase throughout England.

County Expenses, Crime, &c.—The sums expended for the relief of the poor at the four dates of—

<table>
<thead>
<tr>
<th>Period</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
<th>Inc. per cent.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1801</td>
<td>28,249</td>
<td>29,091</td>
<td>57,340</td>
<td>91</td>
</tr>
<tr>
<td>1821</td>
<td>26,840</td>
<td>27,091</td>
<td>53,931</td>
<td>73</td>
</tr>
<tr>
<td>1831</td>
<td>26,613</td>
<td>26,931</td>
<td>53,544</td>
<td>72</td>
</tr>
</tbody>
</table>

The sum expended for the same purpose in the year ending March, 1831, was £6,802; and assuming that the population had increased from 1811 to 1831 in the same rate of progression as in the ten years preceding 1821, the above sum gives an average of £2 for each inhabitant. These averages are below those for the whole of England and Wales.

The sum raised in this county for poor-rate, county-rate, and other local purposes in the year ending 25th March,
1833, was 37,894l. 4s., and was levied upon the various descriptions of property as follows:—

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>On land</td>
<td>£27,805 4s.</td>
</tr>
<tr>
<td>Dwelling-houses</td>
<td>6,998 3</td>
</tr>
<tr>
<td>Mills, factories, &amp;c.</td>
<td>1,030 2</td>
</tr>
<tr>
<td>Manorial profits, navigation, &amp;c.</td>
<td>1,989 15</td>
</tr>
<tr>
<td>Total</td>
<td>£37,824 4</td>
</tr>
</tbody>
</table>

The amount expended was—

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>For the relief of the poor</td>
<td>£26,938 19s.</td>
</tr>
<tr>
<td>In suits of law, removal of paupers, &amp;c.</td>
<td>1,688 12</td>
</tr>
<tr>
<td>For other purposes</td>
<td>7,203 10</td>
</tr>
<tr>
<td>Total money expended</td>
<td>£38,031 1</td>
</tr>
</tbody>
</table>

In the returns made up for subsequent years the description of property assessed are not specified. In the years 1834, 1835, 1836, 1837, and 1838, there were raised 37,706l. 13s. 3d., 32,689l. 5s., 31,191l. 14s. (not specified in 1837), and 26,711l. respectively; and the expenditure of each year was as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Money Raised</th>
<th>Money Expended</th>
</tr>
</thead>
<tbody>
<tr>
<td>1834</td>
<td>37,706l. 13s. 3d.</td>
<td>27,025l.</td>
</tr>
<tr>
<td>1835</td>
<td>32,689l. 5s.</td>
<td>23,365l.</td>
</tr>
<tr>
<td>1836</td>
<td>31,191l. 14s.</td>
<td>20,947l.</td>
</tr>
<tr>
<td>1837</td>
<td>26,711l.</td>
<td>19,962l.</td>
</tr>
</tbody>
</table>

The saving effected in the sum expended in 1838, as compared with that expended in 1834, was therefore 955l. 15s., or about 25% per cent.; and the sum expended for the relief of the poor in 1838 was less than that in 1834 by 932l. 6s., or about 33% per cent.

The number of turnpike trusts in Monmouthshire, as ascertained in 1835, under the acts 3rd and 4th Wm. IV., chap. 80, was 11; the number of miles of road under their charge was 315. The annual income arising from tolls and parish compositions in lieu of statute-duty in 1835 was 31,962l. 7s., and the annual expenditure in the same year was as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual labour</td>
<td>£3,113 15 0</td>
</tr>
<tr>
<td>Team horse carriage of materials</td>
<td>760 16</td>
</tr>
<tr>
<td>Materials for surface repairs</td>
<td>1,330 7</td>
</tr>
<tr>
<td>Land purchased</td>
<td>157 0</td>
</tr>
<tr>
<td>Damages done in obtaining materials</td>
<td>69 8</td>
</tr>
<tr>
<td>Tradecorn's bills</td>
<td>885 2</td>
</tr>
<tr>
<td>Salaries of treasurer, clerk, and surveyor</td>
<td>1,194 3</td>
</tr>
<tr>
<td>Law charges</td>
<td>341 15</td>
</tr>
<tr>
<td>Interest of debt</td>
<td>3,363 3</td>
</tr>
<tr>
<td>Improvements</td>
<td>2,908 11</td>
</tr>
<tr>
<td>Debt paid off</td>
<td>685 16</td>
</tr>
<tr>
<td>Incidental expenses</td>
<td>262 17</td>
</tr>
<tr>
<td>Estimated value of statute duty performed</td>
<td>599 10</td>
</tr>
<tr>
<td>Total expenditure</td>
<td>£16,572 3 0</td>
</tr>
</tbody>
</table>

The county expenditure in 1834, exclusive of that for the relief of the poor, was 4940l. 17s., disbursed as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridges, building, repairs, &amp;c.</td>
<td>263 14</td>
</tr>
<tr>
<td>Gaols, houses of correction, &amp;c., and maintaining prisoners, &amp;c.</td>
<td>1,794 10</td>
</tr>
<tr>
<td>Shire-halls and courts of justice, building, repairing, &amp;c.</td>
<td>66 16</td>
</tr>
<tr>
<td>Prosecutions</td>
<td>1,129 19</td>
</tr>
<tr>
<td>Clerk of the peace</td>
<td>319 17</td>
</tr>
<tr>
<td>Conveyance of prisoners before trial</td>
<td>211 14</td>
</tr>
<tr>
<td>of transports</td>
<td>118 15</td>
</tr>
<tr>
<td>Vagrants, apprehending and conveying</td>
<td>49 18</td>
</tr>
<tr>
<td>Constables, high and special</td>
<td>44 19</td>
</tr>
<tr>
<td>Coroner</td>
<td>147 8</td>
</tr>
<tr>
<td>Debt, payment of principal and interest</td>
<td>318 7</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>318 7</td>
</tr>
<tr>
<td>Total expenditure</td>
<td>£4,940 17 0</td>
</tr>
</tbody>
</table>

The number of persons charged with criminal offences in the three septennial periods ending with 1826, 1827, and 1834, were 282, 412, and 741 respectively, making an average of 40 annually in the first period, of 59 in the second period, and of 106 in the third period. The number of persons tried at quarter-sessions in each of the years 1831, 1832, and 1833, in respect to which any costs were paid out of the county rates, were 60, 53, and 48 respectively. Among the persons charged with offences there were committed for—

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
<th>Convicted</th>
<th>Acquitted</th>
<th>Discharged by proclamation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1831</td>
<td>120</td>
<td>49</td>
<td>39</td>
<td>32</td>
</tr>
<tr>
<td>1832</td>
<td>132</td>
<td>53</td>
<td>39</td>
<td>40</td>
</tr>
<tr>
<td>1833</td>
<td>132</td>
<td>49</td>
<td>27</td>
<td>54</td>
</tr>
</tbody>
</table>

There were 197 persons charged in 1837 with crimes at the assizes and sessions in Monmouthshire. Of these 10 were charged with offences against a person, 4 of which were common assaults; 24 were charged with offences against property committed with violence; 145 with offences against property committed without violence; not any were charged with malicious offences; 8 for forgery and uttering counterfeit coin; 7 for riot, and 3 for keeping disorderly houses. Of the whole number committed 131 were convicted, 37 were acquitted, 5 were not prosecuted, and no bill was found against 2. Of those convicted 3 were transported for life, 5 for fifteen, 7 for ten, and 6 for seven years; 1 was imprisoned for three years, 5 were imprisoned for two years or above one year, 22 for one year or above six months, and 77 for six months or under; 3 were fined. Of the whole number of offenders 156 were males, and 41 females; 57 could neither read nor write, 116 could read and write imperfectly, 10 could read and write well, not any had been instructed beyond reading and writing, and the degree of instruction of the remaining 5 could not be ascertained.

The number of persons registered in 1837 to vote for county members was 4347. Of these 2466 were freeholders, 419 leaseholders, 339 copyholders, 1109 occupying tenants, 13 trustees, 11 mortgages; being one in 23 of the whole population, and one in 6 of the male population twenty years and upwards, as taken in 1831. There was no contest at the last general election for the representation of this county.

Monmouthshire contains 5 savings' banks: the number of depositors and amount of deposits on the 20th November, in each of the following years, were as under:

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of depositors</th>
<th>Amount of deposits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1836</td>
<td>56</td>
<td>£1,094</td>
</tr>
<tr>
<td>1837</td>
<td>57</td>
<td>£1,166</td>
</tr>
</tbody>
</table>

The various sums placed in the savings' banks in 1836, 1837, and 1838, were as distributed, as under:

<table>
<thead>
<tr>
<th>Year</th>
<th>Depositories</th>
<th>Deposits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1836</td>
<td>56</td>
<td>£1,094</td>
</tr>
<tr>
<td>1837</td>
<td>57</td>
<td>£1,166</td>
</tr>
</tbody>
</table>

Education.—The following summary is taken from the Parliamentary Returns on Education made in the session of 1835.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant schools</td>
<td>9</td>
</tr>
<tr>
<td>Number of children at such schools</td>
<td></td>
</tr>
<tr>
<td>ages from 2 to 7 years</td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>64</td>
</tr>
<tr>
<td>Females</td>
<td>78</td>
</tr>
<tr>
<td>Sex not specified</td>
<td>46</td>
</tr>
<tr>
<td>Daily schools</td>
<td>196</td>
</tr>
<tr>
<td>Number of children at such schools</td>
<td></td>
</tr>
<tr>
<td>ages from 4 to 14 years</td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>475</td>
</tr>
<tr>
<td>Females</td>
<td>2,289</td>
</tr>
<tr>
<td>Sex not specified</td>
<td>1,511</td>
</tr>
</tbody>
</table>

Schools. Total.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total of children under daily instruction</td>
<td>6,645</td>
</tr>
</tbody>
</table>

Sunday-schools.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>205</td>
</tr>
</tbody>
</table>

2 X 2
Number of children at such schools; 
es ages from 4 to 16 years:—

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
<th>Sex not specified</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5,157</td>
<td>4,881</td>
<td>2,567</td>
</tr>
<tr>
<td>Total</td>
<td>12,545</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Assuming that the population between the ages of 2 and 18 years has increased in the same proportion as the whole of the population since 1821, and that the whole population has increased in the same ratio since 1831 as in the ten years preceding that time, the approximate number of children between the ages of 2 and 15 thus found residing in Monmouthshire in 1833 was about 35,000. Seventeen Sunday-schools are returned from places where no other school exists, and the children (665 in number) who are instructed thereto cannot be supposed to attend any other school; at all other places Sunday-school children have opportunity of resorting to other schools also, but in what number, or in what proportion duplicate entry of the same children is thus produced, must remain uncertain. Eleven schools, containing 547 children, which are both daily and Sunday schools, are returned from various places, and duplicate entry is therefore known to have been thus created; at several of the Sunday-schools a few are receiving instruction who are upwards of 20 years of age. Making allowance for these two causes therefore, we may perhaps fairly estimate that little more than one-third of the children between the ages of 2 and 15 years are under instruction in this county.

Maintenance of Schools.

<table>
<thead>
<tr>
<th>Description of schools</th>
<th>Number of schools</th>
<th>Number of scholars</th>
<th>Number of parishes</th>
<th>Number of scholars per parish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants Schools</td>
<td>17</td>
<td>104</td>
<td>2,185</td>
<td>51</td>
</tr>
<tr>
<td>Daily Schools</td>
<td>20</td>
<td>542</td>
<td>2,645</td>
<td>26</td>
</tr>
<tr>
<td>Sunday Schools</td>
<td>11</td>
<td>148</td>
<td>191</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>694</td>
<td>7,601</td>
<td>25</td>
</tr>
</tbody>
</table>

The schools established by Dissenters, included in the above statement, are—

<table>
<thead>
<tr>
<th></th>
<th>Scholars</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants</td>
<td></td>
<td>91</td>
</tr>
<tr>
<td>Daily</td>
<td></td>
<td>136</td>
</tr>
<tr>
<td>Sunday</td>
<td></td>
<td>9,396</td>
</tr>
</tbody>
</table>

The schools established since 1819 are—

<table>
<thead>
<tr>
<th></th>
<th>Scholars</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants and other daily schools</td>
<td>114 containing 3,305</td>
<td></td>
</tr>
<tr>
<td>Sunday schools</td>
<td>146</td>
<td>12,122</td>
</tr>
</tbody>
</table>

Sixteen boarding-schools are included in the number of daily schools given above. No school in this county appears to be connected to the children of parents of the Established Church, or of any other religious denomination, such exclusion being disclaimed in almost every instance, especially in schools established by Dissenters, with whom are here included the Wesleyan Methodist.

Lending libraries of books are attached to 8 schools in this county.

MONOCEROSS. [EYMMOTTOMATA, vol. ix., p. 458.]

MONOCYSTEIN (the Unicorn), a constellation of Hevelius, surrounded by Hydra, Canis Major, Orion, and Canis Minor. Its principal stars are as follows:—

<table>
<thead>
<tr>
<th>Character</th>
<th>No. in Catalogue</th>
<th>No. in Catalogue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(82)</td>
<td>(82)</td>
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<tr>
<td></td>
<td>(82)</td>
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<td></td>
<td>(82)</td>
<td>(82)</td>
</tr>
</tbody>
</table>

MONOCHORD (moum, one, and yod, a string), an instrument of one string, used by really scientific musicus, for the purpose of ascertaining and demonstrating the relative proportions of musical sounds. It is composed of a board, or rule, divided and subdivided into various parts, and of a string strained between two bridges, one of which is placed at each end of the rule. There should also movable bridge applicable to the graduated line, in order to stop the string at the distances required, and to both; but this is indispensable. The invention of the Monochord is attributed to Pythagoras, and Ptolemy measured and proved its intervals by it. Guido also, in his Micrologus, says, he recommends the use of this instrument, and gives a description of it, and a formula of translation of which we refer the reader to Hawkins's History, i. 449. In Dr. Crotch's Elements of Musical Composition will be found a simple and cheap method of constructing a Monochord, with plain rules for doubling all the common practical purposes.

MONOCONDYLIAE. M. D. Origiby's name for a sub-genus of Uniopteris, which he describes as equilateral, sub-rotund or angulate with a hinge external. The Monocoxy is a genus of Didomus, which possesses a single coteledon in a rudimentary state. Usually the single cotedon of these plants rolls up, enclosing the radicle and plumula, so that the embryo appears to be in a cylinder with no interruption to the continuity of the surface; but there are many deviations from this, the main striking of which are those of grasses and aquatic Monocotylidae.

MONOCULUS. [BIONICUS, vol. ii., p. 416.]

The face is erroneously placed upside down, and the Monodon, the Linnaean name for the Narwhal.

MONODONTA (or rather MONODON), Lamarche's name for a genus of Trogidae, the colubrids of which terminate abruptly in the tooth or notch. It is the Odontis of Sovereigns.

TROCHIDE. MONOGRAM, a cipher or character formed by an interlacing of letters, intended as an abbreviation of a name, formerly much used. Monograms are of very ancient date. They are not uncommon upon Greek coins, especially those of Macedonia and Sicily. They likewise occur upon the coins of the Seleucids, and are found upon many of the family coins of Rome, though not upon those of the Roman emperors till a late period.

The name of Jesus Christ, upon the coins of Constantine the Great, is well known. It was continued frequently by his successors, even as low down as Alexander Comnenus and Theodorus Lascaris, and was also placed upon one piece of the Roman libation.

Monfaucon, in his 'Palombarus Graecus,' p. 144, has given a small plate of monograms used upon coins, and a number of the earliest manuscripts, to represent the names of Greek c. So this will also be found in Schlegel, 'Comment. de Nov. Alex. M.' tab. 3; and in Freiherr, 'Annal. Reg. Sac. tab. 20. Dr. Charles Combe, in the 'Musaeum Heteromunium,' 4to., Lond., 1782, plates 63 and 64, has given no less than four hundred and twenty monograms which occur upon the coins of the Greek states and cities: others will be found in the 'Veterum Pupulam et Regum Nominum qui in Museo Britannico asservantur,' 4to., Lond., 1814.

The conjunction of two, three, or four letters together is not uncommon in Greek and Roman inscriptions. Many of those of the Roman time will be found in Gourand's 'Sigillum Romanum,' 4to., Lond., 1792. Père Mounier has preserved those of many of the popes. Ducange, in his 'Glossary,' has given tables of those of the popes, emperors, and kings of France. Monograms appear upon almost all the coins of the kings of France of the second race, that is, from a.d. 751 to 987. (Le Blanc, Traité Historique des Monnaies de France, pp. 87-144.) Each monogram gives a reason for Chaluz's usage of a monogram upon his coin, and should he could not write; and Le Blanc thought that a great many bishops did the same for the same reason, which is absurd, as at that period it was the fashion to...
EUROPE generally, they appear upon our own Saxon coins, and especially those of Alfred.

Bartholk, in his "Le Picturis Graecorum," has given tables of the monograms used by the German and Italian engravers. The French artists rarely used monograms. The most extensive information on this class of monograms will be found in the Memoire de l'Institution de Brullot's "Dictionnaire des Monogrammes, Marques figées, etc."

MONOCRANIA [Inanity.]

MONOMANIA, Lamparc's name for his second subclass of the class Parcephalopoda. [MALACOLOGY, vol. iv., p. 323.]

MONOPHEREUS, Lamparc's name for his second order of the class Parcephalopoda Monoca. [MALACOLOGY, vol. iv., p. 323.]

MONOPHOREUS. [Salpidae.]

MONOPHYSITES. [Echinoidea.]

MONOPHROBRANCHIATA, M. de Blainville's name for his third order of the class Parcephalopoda Monoca. [MALACOLOGY, vol. iv., p. 323.]

MONOPOLY. This term is now applied to an individual or group of individuals who have established a monopoly over a particular market, thereby controlling the price and supply of a product or service.

A number of individuals or companies have sought to establish monopolies in various industries, often through legal means such as patent laws or exclusive contracts. These monopolies have led to higher prices for consumers and restricted competition, which can have negative effects on the economy.

In the case of a monopoly, the term "monopoly" is used to describe a situation where a single entity controls a market, often leading to the exclusion of other competitors and the potential for higher prices.

English law, except where there was a royal grant authorising one or more persons only to deal in or sell a certain commodity.

By the act of 21 Jac. I., c. 3, all monopolies and all commissions, grants, licences, charters, and letters patent to any person or body politic or corporate, or for the sole buying, selling, making, working, or using of any thing, or for the sole or any other thing to the prejudice of the laws of the realm and utterly void and of none effect.

By the sixth section of the same statute the above provisions do not extend to letters patent and grants of privilege thereafter to be granted for fourteen years or under, of the sole buying, selling, working or making of any new manufacture to the true and first inventor thereof, which others at the time of making such letters patent and grants shall not use, so as also such letters patent be not contrary to the law or mischievous to the state, generally inconvenient.

This section is the foundation of the present law as to patents for inventions. [Patents.]

Copyright and patents are now generally placed among monopolies by legal writers, but not correctly. The original legal sense of the term monopoly has been already explained; and the power of the crown to grant patents is now limited and defined, as well as the several formalities to be observed in obtaining them. Any patent not obtained in due form is void, and the term monopoly, as above explained, has legal existence as to exist.

There is still a vulgar and common use of the term monopoly, which is incorrect, inasmuch as it has not the sense which monopoly had.

MONOPOLY was, in ancient times, a term used to describe the exclusive control of a market by a single entity, often leading to monopolistic practices and higher prices. It is important to understand the legal and economic implications of monopoly to ensure fair competition and protect consumer interests.

* At Athens there was a law which limited the amount of corn that a man could buy. (Lycurg. Lias xiv. 67.)
to buy as cheap as they can and as good as they can—they will apply this word in an invidious sense to any person or persons who can only command customers because the customers have been trained to expect from them a species of merchandise that nowhere else, owing to no other persons having provided themselves with the commodity for sale.

That kind of monopoly or sole-selling or dealing which is given by the law of copyright, and by patents, is in effect a kind of monopoly by law denoting an exclusive power of an author or inventor, and which he could not effectually acquire or secure without the aid of the law. It is not however a monopoly in any sense in which that term has ever been used. Whether it be profitable or injurious to the community or to contemporaries in general.

MONOSYLLABLE. [SYLLABLE]

MONOTHALAMIA, Lamark's name for his second division of Cephalopoda, including one genus only, viz. Argonauta. [CEPHALOPODA, vol. vii., p. 245; MALACOLOGY, vol. xi.]

MONOTHELITES. [ETYCHIANA]

MONOTIGMA, Mr. Gray's name for a genus of turbinate shells allied to Turrillia.

MONOGRAPH, the name for certain edentate mammals which have but one external aperture for the passage of the semen, the urine, and the other excrements.

The organs of generation of these extraordinary animals present some peculiarities not observed in the other mammals. The different canals terminate in the urethra, which last opens into the cloaca. Their intromittent male organ lies hid, when in repose, in a sheath which opens by means of a hole towards the bottom of the cloaca. Their uterous merely consist of the uterus; and the opening of it is guarded by a double orifice into the urethra, which is large, and, as in the male, has its exit in the cloaca. It was for a long time doubted whether these animals were oviparous or viviparous, but there is now no reason for believing that the young are not brought forth in the body of the parent alive. Though they have no pouch, they still possess the supernumerary bones which exist in the Marsupialia, and are described in the article which treats of the last-named animals. In other parts of their osseous structure they are remarkable for possessing a sort of clavicle, placed more forward than the ordinary clavicle, and analogous to the os furcatorius, furciform bone, or merry-thought in birds: the coracoid bone also reaches the sternum. The eyes are quite small, and there is no external concha to the ear. Two genera only are known, Echidna and Ornithorhynchus. [ECHIDNA; ORNITHORSYNCHUS]

MONOTROPACEAE or small natural order of monopetalous exogenous plants, parasitical upon the roots of other herbaceous plants instead of leaves. They resemble Orobanchaceae, from which they differ in their regular flowers and multilocular ovary. In natural classifications they are usually placed in the neighborhood of Ericaceae, on account of their flowers being monopetalous with hypogynous stamens. Monotropa hypophysy, found in fir woods, is the only European species.

MONRO, ALEXANDER, M.D., was born in 1697. He was a pupil of Cheselden, and afterwards studied at Paris, and under Boerhaave at Leyden. In 1718 he returned to Edinburgh, where his father practised as a surgeon, and the following year was appointed Professor of Anatomy to the Company of Surgeons. He soon after, in conjunction with Dr. Alston, commenced giving public lectures on anatomy, and thus laid the foundation of a school of medicine in Edinburgh, which was soon after attached to the university. It was also at the suggestion and under the direction of Dr. Monro that the Royal Infirmary of Edin- burgh was established, in which he delivered clinical lectures on surgery. Dr. Rutherford at the same time lectured on medicine. In 1739 he resigned the lectureship on anatomy to his son, from whom it has since descended to his grand- son; but he retained his clinical lectureship till within a short time of his death in 1767. He was a fellow of the Royal Society of London, and a member of the Royal Academy of Surgery in Paris; and it is chiefly to his talents as a lecturer that the Medical School of Edinburgh first owed the celebrity which it has since always enjoyed. Be that as it may, Monro's lectures are recorded in the Transactions of different scientific societies, especially in those published by a Society which he was the founder, under the titles of 'Medical Essays and Observations,' and "Essays Physical and Literary." The work by which he is chiefly known is his 'Osteology,' which was first published in 1726, and which has been since reprinted in a great variety of forms, and edition, and in 1817, with the consent of the Continent. His complete works were published by his son, in one volume 4to, in 1781.

MONROE, JAMES, was born in the county of Westmoreland, Virginia, on the 16th of March, 1731, of a Scotch family. He was educated at the College of William and Mary, in Virginia, and in 1762 and 1763, at the University of Edinburgh. He had long been considered as a man of great abilities and capacity, and it was thought proper to have soon shown great decision of character, having entered the army as a volunteer at the age of sixteen. In 1777, in the retreat through the Jerseys, he was wounded at Trenton. He was then a lieutenant, and on his recovery was made a gentleman of the bedchamber to Lord Stirling. Just before the close of the war, he was appointed colonel on the recommendation of General Washington. He then went to the college of William and Mary in Virginia, where he studied law; and soon after represented his native county in the legislature; and was appointed to the council of state. In 1788 he was a member of the Virginia Convention, and was opposed to the adoption of the constitution. After it came into operation, he became a candidate for a seat in the house of representatives; but Mr. Madison defeated him. He was however soon after chosen a senator of the United States by the state of Virginia, and after continuing in that body about three years, he was appointed by General Washington minister plenipotentiary to France, and in 1793 became unacceptable to the ruling party in that country. It was thought that a well known member of the party friendly to the French revolution might be able to restore that confidence between the two countries which was already in a state of decay; and in 1793, he was sent to France as an envoy with the design of concerting terms with Hamilton and his party towards Great Britain. He accordingly endeavoured to fullfil this object of his mission, and, as some thought, at too great sacrifice of the rights and interests of his own country. Such was the opinion that the change of policy by France in consequence of Mr. Jay's treaty, and he was accordingly recalled in August, 1796. It was considered by the Opposition, French, or Democratic party, for it was called by all these names, that he had been sacrificed for his attachment to liberal principles and as the majority in Virginia belonged to this party, he was appointed governor of that state in 1799. He held the office for three years. In 1802 he was appointed minister to France, and, in conjunction with Mr. R. Livingston, who was already in France, and engaged in the purchase of New Orleans, he succeeded in effecting the purchase of Louisiana. From France he went to Spain, and thence to Great Britain, as minister, where, with his adjutant Mr. Pinckney, he made his residence. Mr. Monroe, disapproving, refused to lay before the senate. Mr. Monroe returned home in 1808, much dissatisfied at the treaty, which had been with great difficulty effected, had been received with so little respect, and that his return had been delayed, as he supposed, for the purpose of conferring his competition with Mr. Madison for the presidency. He was accordingly supported by the opposition in Virginia, and great efforts were made to enlist the popular sympathies in his favour; but all these efforts failed, and he obtained no votes in his own state or elsewhere. By means of Mr. Jefferson a reconciliation was brought about, and Mr. Monroe was then made secretary of state, in which office he continued until he was chosen president, in 1814. His administration lasted 12 years, during which he has been his conduct, and so little had the course of public affairs interfered with his popularity, that he was again unanimously, with the exception of a single vote. After his term of office expired, he lived a short time in Loudon county, New York, in which he was born, and which he considered as the seat of the peace. He was also a visitor of the university of Virginia. Towards the close of his life he removed to New York, where he died on the 4th of July, 1831. He left two daughters, Mrs. Hay and Mrs. Guermeur, who resided in New York, in which he had married while member of Congress in 1790.

Mr. Monroe was not endowed with any shining qualities, but he had great prudence, united to great frankness, great regard to the public interest, and an inflexible judgment, and unwearied perseverance. He never could have attained the dignity of the presidency independent of his intimate and political connection with Mr. Jefferson; but it is
small praise to have profited as he did by these favourable circumstances, and there has seldom been so striking an example of what steadiness of purpose and untiring perseverance can accomplish. One cannot but admire, but, considering the society he had always kept, he was strangely awkward in almost all that he said and did: he used old inappropriate expressions, and often said what might have been better omitted. But all this was of course exaggerated, and the conduct of the French was perfectly credible. He had unusual success in making friends, and though his kindness and courtesy would in most people have appeared insincere, it always seemed to come from the heart with him, and without doubt he really possessed many of the qualities which would have made him a most even a worse manager of money matters than Mr. Jefferson. He was always in debt, and always in want of money; but by the grants which he obtained from Congress, and an inheritance derived from an uncle, he left to his daughter a competent fortune. (Communication from Virginia.)

MONROVIA. [Massurada, Cape.]

MONS, the capital of the province of Hainaut, is situated in 50° 27' N. lat. and 3° 55' E. long., on the river Themswald, with a population of 22,921. It is one of the strongest fortified towns in Belgium, the works having been greatly improved since 1818: its form is that of a polygon flanked with fourteen bastions. It is surrounded by the city, of which the ramparts, which were so bravely defended by Quintus Cicero, brother of the orator, against the attacks of the Eburones, Nervii, and other Gallic tribes. Having fallen to ruin, it was fortified anew about the year 1456, in the wars of Mons, and a siege against Hugh Capet, and about fifty years later was again invested by Baldwin of Flanders. In 1492, and again in 1112, great part of the city was destroyed by fire; and towards the middle of the twentieth century it suffered greatly from the plague. Count Baldwin V., who then reigned, did much to repair these disasters, and thus gained the well-merited title of the Restorer. Under his successor Baldwin V., the citizens, having repulsed the count of Brabant, obtained various privileges, among which was the right of carrying arms and of forming a personal defence of the city. In 1290 the city was enlarged, and new walls, enclosing a greater area, were built. In the war which Jacqueline of Bavaria, countess of Hainaut, sustained with the duke of Burgundy, Mons, after an obstinate resistance by its citizens, was taken without resistance. The situation of the city offers little worthy of remark, except the appearance at various periods of the plague, which committed great ravages. Under the reign of Charles V., Mons attained the highest degree of prosperity: and such was the extent of the woollen manufacture carried on, that at the hour when the workmen left their labour the streets were too narrow for the traffic, and the passing of carriages through them was forbidden. Manufactures of wool, satin, and some linen, were carried on there, and several streets wholly inhabited by goldsmiths. This state of prosperity was cut short by the exactions of the duke of Alva in 1569, which caused the inhabitants to revolt, and they for some time maintained themselves and the garrison. The last breach of the city having been treacherously given up to the duke of Alva, the count capitulated, against the wish of the people, who declared their readiness to fight to the last extremity, and to perish in the ruins of the city rather than submit. The garrison, consisting of the citadel, the barracks, and such of the inhabitants as desired it, were allowed to retire from the city. Of those who remained a great part were executed at the stake or on the scaffold. Mons was quiet under the rule of the archdukes of Austria, but its commerce and its splendid passageway with the manufacturers, and the loss of its workmen and artists. In 1678 Mons was invested by the French under mar.
Both monsoons occur in the Bay of Bengal, but there they are somewhat modified and less regular. The north-east monsoon does not set in regularly before the beginning of December, when it blows from north-east and north-east-south-east. In January and February it is irregular, and frequently turns to the south-east, and in March it ceases altogether. It is preceded by heavy squalls and winds in the southern parts of the Bay, and occasionally along the coast of Ceylon during these squalls that this part of Hindustan is fertilised by abundant rains, which however are less plentiful than those brought to the coast of Malabar by the south-west monsoon. The mean annual quantity of rain at Madras is not very large, but it is more regular in its strength, and not in its direction, as it blows frequently from the south, and even from south-east, especially near the mouth of the Ganges. Little rain falls during this wind on the west coast of the Gulf of Bengal, but it is abundant in the countries surrounding the north, in which direction it extends to the foot and declivities of the Himalaya mountains, and as far as the place where the Ganges issues from the range; but here too the quantity decreases as it advances inland. The mean annual quantity of rain in the raining season in British India is from 2 to 2½ feet of water, or 75 to 90 inches. The quantity of rain which, during this monsoon, descends on the eastern coast of the bay, is still larger, especially towards its northern recesses, in Chittagong and Arcan, where, according to a rough estimate, founded on partial data, it amounts to from 3½ to 4½ feet of water, or 135 to 150 inches.

The monsoons are subject to much greater variation to the coast of the Bay of Bengal. In the Chinese Sea and the Sooloo Sea the wind is south-south-east when the sun is in the southern hemisphere, but it does not blow at regular force, being sometimes interrupted by high winds. It brings rain to all the countries which surround the sea on the north and east. In the southern provinces of China, in the Philippine Islands, and in the Sooloo Islands, the rainy season is the period in which they receive the greatest amount of rain. In September and October. The rains, though rather abundant, when compared with those which fall in the countries without the tropics, are much inferior in quantity to the rains in Bengal and Chittagong. It is remarkable that these rains extend to the countries surrounding the Gulf of Tonkin. The monsoon blows in these seas from north-north-west when the sun is in the southern hemisphere; but it is still less regular in its force, though more so than in the Bay of Bengal. It brings rain to the countries on the north and west, the coast of Cochin China, and the northern shores of Borneo, where the rains commence at the end of October and continue until March. They are more abundant than those which fall during the opposite monsoon on the northern part of the continent, and precede the rains from the north.

Along the equator, and about one or two degrees from it, it appears that the winds are subject to frequent changes; and it is also observed that the islands situated within these limits have frequent showers nearly every day in the year. In the Java Sea and the south which encloses the strait which leads from the sea to the Chinese Sea, the wind generally blows from the west when the sun is in the southern hemisphere, and from the east when it is in the northern hemisphere; but it turns freely, and the westerly winds the air is generally dry, but sometimes there are heavy showers. In these islands neither season has that decided permanent character which distinguishes it on the continent of India, and the rains are far from being so violent, and although the monsoons have a more of the character of the season of the continent of India. The rains indeed do not seem to come down with such violence; not a drop falls during June, July, August, and September, which sometimes the case in Java and the Lesser Sunda Islands.

The direction of the monsoons in the vicinity of the land is frequently changed by the direction of the coast, especially when a mountain-range extends along the shores. The most remarkable instance of this phenomenon is observed...
not partake of the fertilising rains which this monsoon brings to all the coasts whose mountains oppose its progress. This, we think, is sufficient to explain the south-west monsoon in the Arabian Sea, where it is most constant and regular.

The south-east trade-wind, not extending to the north of the equator, cannot be considered as contributing to produce the south-west monsoon in the Bay of Bengal; and the east monsoon in the north of this gulf, and therefore seems to owe its existence merely to the rarefaction of the air produced by the heat in the wide plain of the Ganges; but as this plain is partly covered with trees (Sunderbund and Tara) and nearly everywhere with vegetation, the effect of the heat on the temperature of the air is less regular; and thus it may be explained that the south-east monsoon here is less regular and constant. The vegetation which covers the Gangetic Plain is probably also the reason why the rains brought by the monsoon are distributed over its whole extent, whilst it passes over the dry sands of the Thurr almost without letting a single shower fill.

The origin of the south monsoon in the Chinese Sea is more difficult to explain. The great plains of Siam and Cambodia, the mountain-range of Cochín China, which extends along the coast of the South China Sea, and the plains of Tonquin, probably contribute largely to it; but we are too imperfectly acquainted with the extent and nature of these plains to be able to form a correct opinion. The south monsoon extends to the island of Formosa can hardly be ascribed to them. To this explanation, when it is considered that the north-east trade-wind returns to the most northern corner of the Chinese Sea, and is there very feeble and irregular.

As for the monsoon in the Indian Ocean and of the seas between the Lesser Sunda Islands and Australia, there seems to owe their origin principally to the changes of temperature which occur in the countries lying along the northern coast of Australia, of which we have no information at all.

Forrest on 'Journal to the Mergui Archipelago'; and Capper on Winds and Monsoons.

MONSTER, an individual in whom one or more of the organs or parts of the body present some congenital malformation, in consequence of which the affected being differs more or less in appearance and internal structure from other animals of the same species or sex. The term monstrosity is often applied to those anomalies only which are apparent externally, and which produce more or less deformity; but, in a scientific point of view, it includes every variation, either external or internal, of whatever organ, from its most general or natural conformation; and it is in the latter sense that we shall here treat of it.

Monsters were formerly regarded as sports or prodigies of natural nature, and were ascribed to the influence of the stars, or to the want of correct moral character, continued prevalent among all classes of people until the commencement of the last century, and are even now held by the uninformed. By the physiologist, however, the study of the various anomalies of organization in man and animals is now viewed as a branch of natural science. Accurate anatomical examination of numerous monsters, and a minute acquaintance with embryology and comparative anatomy, have shown, that the formation of these different imperfect beings is governed by the same laws which preside over the formation of perfect individuals; and the only difference being, that the process of development in the former cases has been perverted or arrested in its course during the growth of the embryo.

Classification.—In consequence of the immense number and variety of forms of monstrosity (there being scarcely any part in any species of animal which has not been observed to depart from its usual form and structure), it becomes absolutely necessary to arrange them according to some plan. The necessity of a classification is generally admitted, authors greatly differ in the methods which they have adopted; some basing their arrangements upon the forms or peculiarities of the monsters themselves; others upon the theories which they may hold concerning the causes which produce them. The system most generally followed is that which was proposed by Buffon, and which has been adopted with some modifications by Blumenbach and Moëckel. Buffon divided the classes: in the first class, in which the parts of the body are increased in number, constituting monsters by excess; the second contained those beings in whom fewer than the usual number of organs are present.
met with, or monsters by default; and in the third he placed the various irregularities in size, relative situation, and structure of parts, which so often occur. The classification proposed by Meckel (De Duplic. Monst. Comment., p. 21), wherein he divides the human body into the addition of a fourth class, including the different forms of hermaphroditism only. The simplest classification of monsters, being that which excludes all theory as to their causes, is to distribute them according to some simple and obvious characteristics, either development, or the region or system of organs affected; and such is the kind of classification which we shall adopt in the present article.

Monsters may be first divided into simple and compound, the first of which only contain the elements of a single individual, the constituent parts of which are united, or they may be again distributed into classes, which, though not all distinguished from each other by precisely those characters, are certainly important for practical purposes.

In the first of these classes may be included those congenital varieties of conformation which are simple and uncomplicated, only affecting one organ or system of organs, and in most cases not interfering greatly with the performance of the functions of the body.

The second class, on the contrary, contains all those cases in which the degree of malformation is so extensive as to produce great alteration in the anatomical and physiological relations of organs, as well as, in most cases, serious external deformities. In these deformed monsters, Isidore Geoffroy St. Hilaire (Histoire des Anomalies, tom. I., p. 79) is of opinion that the term monster should be confined to these more complex cases, and thinks that all the other kinds of malformation, with the exception of the congenital characters, should be simply termed anomalies; but this distinction is arbitrary and inconvenient; indeed, in dividing this class from the previous one, it is exceedingly difficult to say where one begins and the other leaves off; and, consequently, to know in which of them to arrange particular cases.

The third class may be very clearly defined, for all the malformations which it includes affect one system of organs, namely, those of generation. The monsters in this group are denominated hermaphrodites, the sex being imperfectly developed, and both sexes, or some of their characteristics, being present in one individual.

An immense number and variety of anomalies are included in the first class, which may be again subdivided into ordinary anomaly and those which affect the development of the embryo to an extent so great as to interfere with its subsequent life. These are sometimes called monstrosities, and are distinguished by the size and form of the skull and brain being frequently altered; and in such cases we find a great change both in the form, structure, and position (or arrangement) of the affected limb. Simple alterations in the size or form of parts are so constant that they exemplify the kind of abnormal condition which is preserved, but some very interesting changes in the intimate structure of the tissues of the body have been met with; and particularly that peculiar absence of the colouring matter of the skin which characterises the state called albinism. A description of this curious anomaly has been given in the preceding chapter, and we shall only here state that its origin must be accounted for by simple arrest of the process of development. M. Geoffroy St. Hilaire says (Hist. des Anomal., tom. I., p. 219), 'Coloured forms of colouring matter are deposited in the fetus up to a very advanced period of intra-uterine life, and even in black or dark people the integument remains, for some time after birth, of the same colour as in the children of fair men. We can easily conceive therefore that before the development of the nervous system, before the period when, in the natural order of formation, the pigment is deposited in the mucous layer, and consequently it will remain uncoloured. The colouring matter of the skin and hairs, the iris and the choroid, may thus be deficient in an individual (independently of any pathological alteration), in the same manner as any organ or part of an organ may be wanting from arrest of development.' If any doubts remain regarding this explanation, they are removed by the circumstance that the absence of pigment is not the only condition of that life which is preserved in albinism. We know that the fetus, during the latter part of pregnancy, has the skin covered with down; and this down is frequently preserved in albinos, particularly in those which are met with on the isthmus of Panama. Lastly, the persistence of the membrana papillaris in some of these cases beyond the period of its existence, is another equally evident proof of arrest of development.

Many curious anomalies in the position and connection of parts have been met with, and it has been observed that organs are subject to changes of position in proportion as they are less important in the organs which they comprise. The walls of the abdominal and thoracic cavities are thus much less subject to alterations in the position of their component parts than the organs which are considered to be of a higher order. The organs here have been found removed from one part of their natural cavity to another, or transported into a neighbouring cavity, as from the abdomen to the chest; and some of the organs may protrude externally, when the malformation has been so extensive as to render the walls of the body incapable of retaining them internally. These anomalies the most curious is that in which the viscera are generally inverted, all the thoracic and abdominal organs presenting exactly an opposite arrangement to that which constitutes their natural state; the liver, coecum, three- dressed lungs, etc., being transposed to the right side, being transposed to the left; while the heart, spleen, sigmoid flexure of the colon, &c., are found on the right.

It is the peculiar characteristic of this monstrosity, that though the actual situation of the viscera is changed, their relative positions are maintained, and the alimentary canal is generally the same as in the normal subject. It was communicated by Mery to the Academy of Sciences (of an invalid soldier, aged 72), may be prolonged to its ordinary term. The causes of this malformation are exceedingly obscure, but it seems probable that general change of position of the embryonic organs depends upon the situation in one important organ, as the heart or liver; for we know that many organs are connected by their functions, or by the medium of large blood-vessels, in such a manner as to acquire a certain relative situation to each other, which also becomes necessary to preserve the general shape of the animal. Accordingly we find that when any important viscus is changed in its situation, other viscera are affected in a similar manner. In the earlier periods of the development of the embryo, the parts of the alimentary canal are naturally placed in the centre of the body, or in the median line: this is the case with both the heart and liver. The knowledge of this fact enables us to understand more readily how these parts may remain in some species or in some individual parts of the body, which are usually found; though we are unable to explain the mode in which they change the direction of all the other abdominal and thoracic viscera.

Together with the alterations of connection, we must place those which present themselves as changes in the intestinal canal; different organs, naturally entire, are apparently divided into two or more portions, as in Hare-lip and Spina bifida. The latter of these malformations consists in a division or fissure of the posterior part of the rings of the vertebræ, either in one or several cases, of which the parts, or some of them, are supposed by analogy to take place in almost all), that the growth goes on from the circumference towards the centre, and that the lateral parts of each organ are developed with less intensity than the central, and the same thing is true of the posterior part. If the process of development becomes arrested by any accidental cause, these states will become permanent, and the child will be malformed.

We have shown that the process of development may produce unnatural separation of parts, and it may also occasion the closure or connection of parts naturally open or separate. Thus we frequently meet with deficiency of one or more of the orifices which open on the surface of the body, and particularly of the nose, which may be perfect, and its orifice only closed by a membranous fold,
or it may be very incomplete, and terminate in a cul-de-sac at a greater or less distance from the situation of its natural outlet. The division is easily distinguished by the mode of formation of the alimentary canal, which is originally a prolongation of the intestinal vesicle, which gives rise in one direction to the stomach and upper part of the digestive tube, and in the opposite direction to the inferior or descending part of the intestines. The formation of either of these portions may be arrested in any part of its course (the canal terminating in a blind extremity), though the large intestines, as the colon or rectum, are most commonly the seat of this anomaly, which, on account of the serious interference which funnels in structure and appearance, and may be even entirely deficient, in cases where the head and trunk preserve almost their regular form. Monsters have been seen in which the hands or feet were alone developed and inserted immediately upon the trunk. From a fancied resemblance between the state of the limbs in these monsters and their natural state in the seal and other amphibious animals, the name Phocaenidae has been applied to them. M. Duméril (Bullet. de la Soc. Philom. xii. art. xi.) has described a man who was affected with this anomaly, and who died in Paris about the year 1800, at the age of 62. His body was carefully examined after death, when all four limbs were found alike deficient; the two clavicles were united by the humerus, and the arms did not exist at all, but the hands were articulated by the bones of the wrist immediately to the scapula. In the abdominal limbs the head of the femur and the trochanters were mere mere, and a rudimentary stumps existed which was articulated with the foot, but had no connection with the short thigh-bone. The hands and feet have sometimes been found wanting in cases where the whole or part of the arms and legs were developed, which terminated in a rounded extremity; and, lastly, some of the limbs in man and different animals have been found entirely deficient. In another family of monsters, denominated Sympletes, or Sirens, the two thoracic or abdominal limbs are fused together into a single member: thus the trunk is prolonged into a long stumpy stumps; and, instead of the limbs in man and different animals have been found entirely deficient. In another family of monsters, denominated Sympletes, or Sirens, the two thoracic or abdominal limbs are fused together into a single member: thus the trunk is prolonged into a long stumpy stumps; and, instead of either a double or single foot, or terminating in a point or stump. These monsters are generally malformed in some other respects, and mostly die soon after birth.

The trunk may be the principal seat of malformation, which is chiefly a part of the head and limbs similar. In monsters of this kind evagination has generally been found, accompanied with other anomalies. Evagination consists in imperfect development of the walls of the abdomen, and consequently protrusion of the greater part of the viscera, which are covered only by a very thin and delicate membrane, consisting of the dilated base of the umbilical cord. This anomaly may be solely confined to the abdomen, or it may also involve parts of the extremity. If the cavity of the upper part of the abdomen, the sternum may be divided by a fissure, or may even be completely wanting, so that the heart will be suspended like a bubble in the amniotic fluid. The diaphragm is also imperfect, being partly wanting or divided (J. Geoffr. St. Hilaire, Hist. des Anoms. t. xi. p. 237.) When the evagination occupies the inferior regions of the abdomen, the urinary and genital organs are often imperfectly developed, as well as in some cases one or both of the abdominal limbs. Extravention of the bladder is an uncommon but well known anomalies of this class. In this malformation there is both displacement and imperfect development of the bladder itself, as well as of part of the walls of the abdomen, the front wall of which is deficient, and the bone membrane of its posterior side is retroverted, forming a soft, red, projecting tumour above the symphysis pubis. On the surface of this tumour, towards the lower part, two apertures may be observed, from which the urine is constantly trickling; these are the openings of the ureters and the bladder. The bladder does not seriously impede the performance of any of the vital functions, and therefore is not incompatible with prolonged life; but the more complicated forms of evagination are necessarily fatal. In two of the preceding families of monsters the head is slightly at all deformed; but many instances have been met with in which the head and face are the parts most excessively altered, though it has been observed, that whenever serious malformation of the cerebral organs takes

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place, some other parts of the body participate in the anomaly. The brain has often been found imperfectly developed, and situated wholly or partly without the cranial cavity, the walls of which were incomplete. In these monsters, which have been named _Eocenecephali_, the brain may protrude through an opening in the posterior or occipital region of the skull, or in the anterior or frontal region. The bony displacements of the brain are often accompanied with merriform or spiral fissure. The brain in some cases has been entirely deficient, and the vault of the cranial absent, a bright red-coloured tumour composed entirely of vessels lying on the base of the skull, and parts of the free surface of the brain. In some cases of this kind the vertebral canal has been seen widely open, and the spinal marrow also deficient, the vascular tumour sometimes existing and sometimes not.

The face in some monsters is the principal seat of anomaly, and no form of monstrosity has attracted more attention than that denominated _Cyclopia_, in which, from atrophy of the nasal organs, the eyes approach and unite in the median line. In some of these beings, which have also been called _Cyclopsia_ of St. Hilaire, the two eyes are placed very close together, but still remain distinct, the bony parts of the nose being entirely atrophied, but the soft and tegumentary parts remaining in the form of a proboscis, or trunk, situated above the orbits, which, though capable of some movement, are not united. In other cases only one orbital cavity has been found, containing a double eye, the component parts of which are sometimes so blended together, that only a few traces of duplicity remain; thus the cornea, pupil, and crystalline lens have been found quite united in one eye. (Histoire, t. ii., p. 287.) None of these single-eyed monsters have ever been known to live for more than an hour or two after birth, and their speedy death must be accounted for by the imperfect state of the brain, which constantly accompanies this anomaly. In information of the only case recorded to such an extent, that the natural structure becomes completely lost, and a mere shapeless mass remains; and, lastly, in those monsters to whom the denomination of Acrocephalus, Horsfield and others applied, the head is entirely deficient, no external vestiges of it remaining. In these very imperfect beings other parts of the body always participate in the malformation; the symmetry of the form is lost, one or both of the superior extremities are generally deficient, and many of the thoracic and abdominal viscera wanting: the heart and lungs have been found absent in most cases; and some writers have remarked that the heart is never found in accephalous foetuses, but the testimony of many observers has proved that this is incorrect. (Bulwer, Anatom. i. 205.) In one of the cases described by Horsfield, there was a curious case (I. de la Soc. Méd. d'Émulpt, Sept. 1821), in which an accephalous foetus was furnished with a simple tubular heart resembling the dorsal vessel of insects, into which arterial vessels opened. This case is peculiarly interesting, since we know by the researches of embryology that the heart first appears in the embryo in the shape of a long tubular pound, which ordinarily transient state had doubtless become permanent in the above monster by arrest of the process of development.

Some of the irregular shapeless masses generally called moles, consisting of different organic parts, as teeth, bones, hair, skin, _&c._, which are occasionally found in the uterus or ovaries, must be considered as the imperfect products of emanations from a similar cause. But we must distinguish these cases from others which often very closely resemble them, in which tumours of a similar kind have been found in the ovaries of virgins, and even of girls before puberty, the occurrence of which must be explained in quite different manner, either by the action of some morbid process in the system, or by the theory of monstrosity by inclusion, which supposes that the elements of one being have been originally enclosed in the body of another where they have remained in an imperfectly developed state.

The last class of simple monsters includes the various forms of hermaphrodism. An hermaphrodite was defined by the ancients as an individual capable of fulfilling by turn the functions of both sexes, or at least of one who simultaneously possessed both the male and female organs fully developed; such a being is however not only unknown among the authentic details of anomalies, but is physically impossible in man and the higher orders of animals without extensive alteration in the connections of the bones and other parts of the pelvis. The signification of the term hermaphrodism is now much extended, and is used to designate an individual who possesses any mixture of the characters of the two sexes. An immense variety of these malformations of the generative organs has been observed; but in most cases the malformed being belongs exclusively to one or the other sex, and is only related to the opposite sex by some few characters. The two families of male and female hermaphrodites have been thus formed, which include a great proportion of the cases which have been met with. In both of these forms of anomaly, by a careful attention during life, or during their earlier death, it will be found that all these beings are essentially male or female.

In a few cases of what have been denominated neuter and mixed hermaphrodism, the organs belonging to the opposite sexes seem to have been so blended together in the same individual, that the being could not be referred to one sex rather than the other, but these instances are very rare. A most curious instance of this description is given by Scholle, German anatomist. (Med-Chir. prakt. Arch., von Haden, &c., t. i., 1804.)

The mode of origin of hermaphrodism is very obscure, though the first mentioned forms of this anomaly may probably be referred to some arrest or excess in the process of development in the case of generative organs; a very close resemblance exists between the generative organs in both sexes.

We now come to those curious and interesting anomalies in which the component parts of two or more distinct beings are blended together, as the two subjects composing a double being may possess an equal degree of perfection, or be very dissimilar in size and structure, one appearing as a mere parasitical appendage of the other: thus two individuals nearly perfect and distinct in shape and development are united in one individual. There are cases in which one individual then has eight extremities; in others there is only one supernumerary extremity, which, in some cases, has been observed single at its origin and doubled or tripled towards its termination, as when two or three feet are attached to the same arm. (Anat. Park. Vol. 1.) It has been observed that in whatever manner or degree two beings are joined together, they are always united by corresponding aspects of the body, that is to say, side to side, face to face, or back to back; each part and each organ in the one individual is connected with the corresponding part or organ in the other. Thus every vessel, nerve, or muscle situated in the line of union joins itself to the corresponding vessel, nerve, or muscle in the other subject, in the same manner as the two primitives are united in the single individual, which, according to M. Serra's theory of eccentric development, is originally separate, unite by the progress of development.

We have already said that the two subjects composing a double monster may be both nearly perfect and distinct, only adhering together by one region of the body. Beings of this description are sometimes capable of supporting an independent vitality for a considerable number of years, though they are mostly destroyed during parturition; their structure occasioning great difficulty to the process of delivery. Of the cases usually regarded as remarkable was that of a double female who was born in Hungary in 1701, and christened by the two names of Helen and Judith. This monster was shown about seven years in almost all the countries of Europe, and lived to the age of twenty-two years. Her legs were each quite perfect, except at the point of union, where they were placed back to back, and united by the buttocks and part of the loins. The external organs of generation offered distinct symptoms of duplicity, though there was a single vulva, which was placed inferiorly and hidden between the two thighs; the vagina was at first single, but soon divided into two distinct canals, which led to separate uteri. The two intestinal canals likewise terminated in a common anus, and the various appendages, or at least some of them, were each quite perfect.
was ill the other felt so too, and participated in her sister's distress; it was therefore predicted that the death of one would necessarily occasion that of the other. This was true. Judith, at the age of twenty-two years, was attacked with disease of the lungs and brain, of which she died. Heden, who, at the commencement of her sister's attack, which had been ill, and both expired at the almost the same instant.

The junction of two fuses may take place by almost any region of the body; thus they have been seen attached to each other by the crown of the head, both being placed in a single body; this was noticed by Chevalier (Gén., 410, Paris, 1831); by the anterior portion of the thorax, or abdomen, or by part of the front of both, as occurred in the well-known double monster which was exhibited in London in 1829-30, and denominated the Siamese twins. In this instance the two brothers were only furnished with a single umbilicus. Two varieties have been observed in the mode of junction wherever situated; in one the attachment is superficial, being effected only by the skin and bones; in the other it is more deeply seated, the cavity of the body at the point of union communicating in the two individuals, or being in fact converted into one; thus, the chests being united, the sternum may be altogether deficient; and the thoracic cavities thrown into communication, in which case the chest becomes mesoscolic, that is, with a middle arrangement. Sometimes there are two hearts, which are perfectly distinct, and enclosed in separate pericardia; sometimes the hearts, though both well formed, are contained in one common pericardium, in which they may be either in the form of a single organ arranged at some point. In other cases two hearts are found, but both in a very imperfect state; lastly, there may be only one heart presenting several vices of conformation, as three or four ventricles unvariably large, and partly divided by a septum. In other cases of this description the heart has been found single and well formed, but the large vessels have been all double, so that two aortas sprang from the left ventricle, &c. In these cases a single organism has been proved to exist, the two individuals being distinct and separate at their lower halves, but more or less intimately united at the upper part of their bodies, so that they appear to have a double body and single head. In others, on the contrary, there are two distinct heads, and the upper part of the body is double, while the pelvis and inferior extremities are nearly or quite single. In some cases belonging to the former of these divisions the separation of the bodies is only complete inferiorly, all the parts above this being united. The most singular case was that of a female, the separation of which was accom- plished in the uterus; in others the separation is perfect as high as the neck. In all these instances however the head and upper part of the body, although apparently single, almost invariably present on dissection some supernumerary parts, which it is impossible to determine whether they were due to the union of two monsters which are furnished with two heads and a single body offer numerous varieties; the head may be double, but not distinctly divided, there being two faces, more or less perfectly formed, placed side by side, and united by a longitudinal division; each face is generally provided with a pair of eyes, but sometimes there are only three, one being placed in the median line and formed by the union of two together, as in cases of Cyclopa. The two heads may be completely double, but the body and extremities single. Lastly, the heads and upper halves of the bodies may be separate, there being four upper extremities, while the monster is only single by the pelvis and lower extre- mities. A human monster of the last kind, which lived to be born, was exhibited at Paris in 1793, it was a double female, and denominated Rita-Christina. It was born in Sardinia, and was brought to Paris to be publicly exhibited. It was carefully examined after death, and a detailed account of its structure has been given by Hellhammer in the Transactions of the Medical Society of Paris. The two vertebral columns were found quite distinct in their whole length, and a rudimentary pelvis separated them inferiorly: another fully developed pelvis was found in its natural position, which supported the two malformed bodies. Each consisted of a single bladder, uterus, and rectum, which were common to the two subjects, but behind these organs were found rudimentary traces of others. There were two distinct hearts, and all the other thoracic and most of the abdominal viscera were doubled. A singular and unique case is recorded by Sir E. Home.

(Philos. Trans., vol. lxxx., p. 236, and vol. lxxix., p. 28; also in Lectures on Comparative Anatomy, 1 iii., p. 334), of a child born at Paris, in 1774, with a head and two arms on its summit on to the crown of the natural head. The body of this child was well formed in every respect, having no supernumerary parts, and the principal head was quite natural in appearance; the part before the parietal region, where its integuments were continued into those of the accessory head. The latter was placed in an entirely inverted position, the neck, which terminated in a round tumour, being directed upwards and a little backwards. This monstrous child lived for more than thirteen years, and was to be four years old, and then only died from the bite of a serpent. In this case, which must be included with those of double monstrosity, we must suppose that the body and limbs belonging to the accessory head had become completely atrophied, but it is exceedingly curious how this remaining part continued to live solely by means of vascular and nervous communication with the principal individual, and without any separate umbilical cord or special organs of nutrition. The last variety of monstrosity which we shall mention is that by inclusion. In these cases fragments of one fetus have been found contained in the interior of another. A case of this kind is recorded by M. Dupuytren (Bull. de la Faculté de Médecine, vol. i.), who found a cyst in the transverse process of the vertebrae, which contained a perfect and well-organized mass, which, when carefully examined, presented traces of the brain, spinal marrow, nerves, muscles, and most of the bones of a fetus, but no vestiges of the organs of digestion, respiration, or circulation. Similar cases have been recorded in various other instances, and in animals, and there is doubt of their nature; though the mode in which the germ of one fetus has become included in the body of another is at present entirely unknown.

Compounded monsters, formed by the union of more than two distinct individuals, are exceedingly rare, and very few authentic cases of such anomaly are on record.

None of the different theories which have been proposed in explanation of the mode of origin of single monsters and how any light could be thrown on the cause of such cases is correct. It is difficult to decide whether the two monsters have been originally double, or whether two or more have become united during the progress of development. The latter is the most general opinion; and the most probable idea respecting their mode of union is, that two ova become adherent whenever they are contained within the same membranes, and opposed to each other by corresponding aspects of the body.

Predisposing and exciting Causes of Monstrosity.—Of these little is known; for while the influences determining the phenomena of normal development are hidden from us, those presiding over irregular formation must necessarily be involved in darkness. In the article Forces it is stated that the conception of the fetus is considered to be successively developed, and not evolved from originally pre-existing elements: the notion therefore that the germ of the future embryo is ever originally monstrosous previous to impregnation must be abandoned, and the causes giving rise to the various forms of congenital malformation must be sought for in some accidental influences disturbing or arresting the process of development in the embryo. Direct evidence has been afforded by experiment that the natural stages of formation may be so altered in the embryo of the chick during incubation by external injury. Godfrey St. Hilaire injured several eggs in which the process of incubation had commenced, and had been going on naturally for several days. He shook some of them violently, and the eggs, instead of being put to different places with a sharp instrument, or kept them in a vertical position, upon either the large or small end, during the whole time of hatching; a gain, in some he covered the part of the shell with wax, or a piece of black cloth, and his injuries were the production of a very considerable number of anomalies, either simple or complicated, among which may be mentioned cyclopia and other malformations of the face and head, bronchial obstruction and stomach and intestines the case of double monstrosity met with, which might a priori, have been supposed; a double monster being composed of two distinct embryos, the germs of which must have previously existed in the same egg. (Mémoires du Muséum, xiii. p. 289; also Journal Compend. des Sci. Med., tom. xxxiv.)
The younger St. Hilaire repeated these experiments in a different manner, altering the structure of eggs previous to the commencement of the causation, and during the course of each process, as had been done by his father. His experiments were attended with quite a different result: the more violent disturbing influences destroyed the vitality of the embryo altogether; others, less active, produced general retardation or arrest of the process of development of the whole body; but in no instance was malformation of any one region or part effected. (Hist. des Anom., toin. iii., p. 503.) These experiments confirm the opinion that anomalies involving a single individual must principally be referred to the operation of some one disturbing cause occurring during the process of development. In some instances the birth of a monster has undoubtedly followed an accident received by the mother during the months of gestation, such as a fall, a violent blow on the abdomen, or some local anaesthetic. But the nearest approach to the serious accidents during pregnancy. It is unnecessary to bring forward any arguments to refute the antient superstitious notions of the vast influence which the imagination of the mother was supposed to exert over the formation of the embryo, for that hypothesis is no longer supposable. It is impossible that any object which has been seen or longed for by the parent can be depicted on the body of the child; and in most cases where the child has been supposed to have been deformed through the influence of any such cause, if the object mentioned received by the mother be not fully ascertained, it will be found that the organ supposed to be altered or marked by such impression must have been nearly or fully developed at the time that it was received, and therefore could be in no way affected. And we cannot admit causes for some malformations, or the occurrence of disease in the fetus itself, and there is no doubt but that some cases of anencephalia and other malformations of the brain and spinal cord must be referred to diseases occurring in the interior of the mother during the embryo. In these cases this explanation is insuperable, and supported by no proofs. Many other hypotheses have been proposed to account for the production of monsters, as admissions between the fetus and its investing membranes; modifications in the quantity and quality of the nutriment received by the embryo; pressure made on the fetus by tumours attached to the parietes of the uterus, &c. It is unnecessary to enter into the consideration of these causes; for, after all, we only have the conclusion that the development of the embryo in anomalous cases has been diverted from its natural course, or arrested by some accidental cause, which, whether taking its origin in the fetus itself, or acting secondarily on the embryo, is involved in obscurity.

Though the occurrence of accidental causes acting during the process of development will account for most of the phenomena of monstrosity, yet it will not account for all. It has been observed that some malformations are hereditary, are transmitted from father to chlidren; and since all the influence of the father on the child must cease with the act of fecundation, these anomalies must be dated from the moment of conception.

Laws of Monstrosity.—From extended observation it has been found that all the forms and varieties which monstrosity presents are apparently under the control of certain fixed laws; or, in other words, there appear to be a number of general facts which are applicable to all cases of malformation. To these facts it is necessary to be acquainted with, since, by a knowledge of them, we may often be enabled to distinguish (when reading or hearing descriptions of monsters, or looking at figures in old works) those anomalous cases which may really have existed, from others which are only fanciful, and abound with the productions of a fertile imagination. To one of these laws we have already alluded, for instance, the fact that union between two individuals forming a double monster always takes place by corresponding parts of the body; and we shall now briefly mention several others.

Monstrosity, however complicated and extensive, is never carried to such a degree as to remove the animal affected with it out of the series of natural beings in which it has been originally placed; no entire being nor organism has ever been met with so deformed that the species to which it belonged could not be recognised. Again, in the most extensively deformed monsters the relative connections between different organs are never so completely altered that it becomes impossible to distinguish them by the position which they occupy. Thus the heart has never been found in the cranium, nor the brain in the abdominal cavity; while the stomach and the intestines of the most monstrous individuals are always placed as in normal individuals.

Anomalies are more frequent in proportion as they do not affect vital organs nor interfere with any important functions. Thus we very commonly meet with irregularities in the course of blood-vessels, since it signifies little whether the blood arrives at the right or the left extremity of the heart, or arrives at the organ to which it is destined to supply. It has also been found that the parts most liable to vary are those which are the latest in attaining their complete evolution; and this fact may very readily be explained, for if the process of development be disturbed or arrested by any cause during the course of fetal life, those organs which are already nearly or fully formed at the time of the occurrence of such disturbing influence will be little or not at all subject to such suppression or very marked alteration may be effected in other parts of the formation which has not commenced or is very imperfect. This fact has been explained in another manner, by supposing that different organs are subordinate in their formation one to another; so that the suppression or arrest of a part of the development preceded it. Thus the suppression of any part will not influence those which have been previously formed, while it must necessarily lead to the complete absence of all those which ought to have followed it in the order of development.

A kind of compensation or balancing has sometimes been observed between different organs in monsters; excess of development in one part being accompanied with a corresponding arrest of formation in some other organ. Thus the head of a monster usually has fewer teeth than the number on one hand frequently has the opposite limb furnished with fewer than the usual number, and monsters deprived of the brain have been observed to have the face unusually large. Many other applications have been made of the theory of compensation, as it has been termed by Geoffroy St. Hilaire.

It has been said that the left side of the body is more frequently deformed than the right, and that a greater number of monsters belong to the female than to the male sex, which last fact Meckel explains by the theory that the generative organs are in both sexes originally female, and that many monsters remain of that sex by arrest of development, who, if naturally formed, would have been males.

For the further instruction of the reader the following table is added. The reader may particularly consult Haller's treatise De Monstris; Meckel's Manual of Pathological Anatomy (German); Geoffroy St. Hilaire's Anatomie Physiologique; and his son Isidore Geoffroy St. Hilaire's Histoire des Anomalies.

MONSTRELET, ENGUERRAND DE, a celebrated French chronicler, lived in the fifteenth century. His quotations from Lurs, Sallust, and Vegetius lead to the opinion that he must have had a tolerable acquaintance with Latin literature. M. Dacier supposes that either from bodily weakness or a predominant taste for study, he altogether abstained from the profession of arms, which at the time when he lived was almost essential to the character of a gentleman. The same author is also of opinion that he became a naturalist, as he mentions the fact that he was nor indeed acted in any of the events of his time, but was a quiet spectator of the circumstances which he has recorded. In all his work Monstrelet only alludes to himself. He has been the captain of the guard of Orleans before Compiegne (livre iii. chap. ix.). He tells us that he was present at the interview between the Pucelle and the Duke of Burgundy, and almost implies that he was not present at the skirmish in which the capture was effected. He has been considered by many as the Duke Philip perhaps as historian. The rest of his life he passed in the city of Cambrai, where he held several offices, being bailiff of the chapter of Cambrai, provost of the city, and bailiff of Wallancourt. He died in the middle of the year 1453.

The first book of the Chronicles of Monstrelet begins with the year 1400, and ends with the year 1422; the second concludes with 1444. The early editions contain a third
and fourth book, which are both rejected by M. Buchon, as a modern editor; the latter for the obvious reason that the
events which it records did not take place till after the death
of the chronicler, and the former on the authority of M. Coney,
who declares that Monstrelet stopped at 1444, as well as from
the result of certain critical investigations on the part of M. Buchon.

Monstrelet is greatly commended for his minuteness of
detail, his fidelity, and the extended view he takes in his "Chronicles"; for, like Froissart, his predecessor, he does not
confine himself to France alone, but gives all the circum-
stances of the wars of the countries of Europe which were
within the compass of his knowledge. His principal object
was to give a history of the wars of his time, and of the persons
engaged in them, but he adds much valuable information, both political and ecclesiastical.

In France there are several manuscripts of Monstrelet.
The first printed edition is a quarto, dated 1512, which was
followed by four others, the last dated 1603, all containing
the additional books rejected by Buchon, who however
praises the third edition (1578) for its accuracy. The new
edition by Buchon was published in 1836, and forms part of
a series of the "Pantheon Littéraire," in which it is designed
to give all the principal chronicles of France. In 1808 an
English version of Monstrelet was published by Mr. Johnnes,
the poet.

MONT DE MARSAN. [LANDS.] MONT DE PIETÀ (MONTE DI PIETÀ), in Italian, a
benevolent institution which originated in Italy in the
fifteenth century, the object of which was to lend money
free of interest to the poor. The first regulating law was
the great money-lenders in that age, enacted an exor-
rious interest, and as much as 20l. to 25l. per cent. The
Papal government and other Italian governments estab-
lished such institutions, having been in operation for a
fixed term, at a low rate of interest, intended chiefly
to defray the unavoidable expenses of the establishment; at
the expiration of which term, if the capital lent and interest
were not repaid, the pledges were sold, and the surplus
remained after the expenses of the institution, as well as
for the benefit of the borrowers, and not for the profit
of the lenders, and that every reasonable facility was afforded
the latter. The administration of the Monte di Pietà was
therefore conducted upon economical and strictly equi-
table principles. George II. of Hanover, by charter of 1711,
gave to the city of London a public institution for the good
of the poor, at a rate of interest fixed by act of Parliament.

In most instances however the term might be re-
newed by merely paying the interest. The difference
between these establishments and those of the ordinary pawn-
brokers seems to have been that they were intended mainly
for the benefit of the borrowers, and not for the profit
of the lenders, and that every reasonable facility was afforded
the latter. The administration of the Monte di Pietà was
therefore conducted upon economical and strictly equi-
table principles. George II. of Hanover, by charter of 1711,
gave to the city of London a public institution for the good
of the poor, at a rate of interest fixed by act of Parliament.

Leo X., some say Paul III., sanctioned the first establish-
ment of a Monte di Pietà at Rome, which was under the
direction of a society of wealthy persons, who, having con-
tributed the necessary funds, lent upon pledges small sums
not exceeding thirty Roman scudi, a little more than six
pounds sterling, to each person. The money was lent for a
term of eighteen months. The establishment was under
the inspection of the treasurer of the Apostolic Chamber.

Large storehouses were annexed to the office, which stood
in the district dell' Aragola, near the banks of the Tiber.
(Richard, "Description de l'Italie", vol. v.) Other establish-
ments of a similar nature existed at Milán, Florence,
Naples, and most other towns of Italy. That of Padua is
one of the oldest on record, having been established in 1491,
when the Jewish banks, which lent at ventures interest,
were shut up. (Scardeoni, "De Antiquitate Urbis Paduei.")

Charities came into the Netherlands, and Monts de Pétè were
established at Brussels, Antwerp, Ghent, and other places. In
Spain there were also similar establishments at Madrid and
some other cities, where, owing to the misfortunes generally
spread as in Italy, the original country of benevo-

sions for war contributions, was obliged to make an agreement with the
payers of the "Pledge of the Monte di Pietà" for the reparation of
which he gave bonds; but these bonds lost all value in the
subsequent invasion of Rome by the French in 1798. The
Monti di Pieta have been re-established in most Italian
cities.

The Monti Frumentarii, in several parts of Italy, are
storehouses of corn, which is lent to poor cultivators
on the same principle as money by the Monti di Pietà.

BRESCIA. MONT D'OR. [Puy de Dôme.] MONT LOUIS. [Pyrenees Orientales.]
MONT LUCON. [Allier.]

Montagna, Dr. Loach's name for a genus of Macra-
rous crustaceans allied to Callianassia.

Montagu, Lady Mary Wortley, by birth
Lady Mary Pierepoint, was the eldest daughter of Evelyn
earl of Kingston (afterwards marquis of Dorchester, finally
Duke of Kingston), by his wife the lady Mary Fielding,
dughter of William earl of Denbigh, and was born at her
mother's seat of Thoresby in Nottinghamshire, about the
year 1690. Displaying great attractions of person as well as
spirituality of mind from her earliest years, she was the
fame and pride of her father, who, having lost his wife in
1694, and continuing a widower, introduced his daughter
to society, and placed her preside at his table, in the hope
that she had well outgrown her childhood. It does not appear
however that there is any truth in the common account of
his taking pains to have her talents cultivated by a learned
education. What Latin she knew seems to have been acquired
of her nurses, and the further education she received at the
latter part of her life, and in personal intercourse with the
woman who had studied Greek, a translation made by her,
when a girl, of the 'Encheiridion' of Epictetus, which has
been referred to as a proof of her knowledge of that language,
which she read from the Latin. She had read at least however
an eager reader of whatever fell in her way in her mother-tongue.

In August, 1712, without the consent of her
father, with whose views in regard to a settlement his
proposed son-in-law had refused to comply, Lady Mary
married Lord Wharton, having obtained her father's
permission. Hon. Sydney Montagu, and grandson of the first earl of
Sandwich. Her letters to Mr. Montagu before their mar-
rriage, which have been published entirely for the first time
in the late complete edition of her works by her great-
grandson, the present Lord Wharton, afford much of her
attained much of that sharpness both of style and thought
for which her writings are remarkable, as well as a maturity
of judgment far beyond her years. Soon after the acces-
sion of a new king, who had reigned for some years in
parliament, obtained a seat at the Treasury Board, of
which his cousin Charles Montagu, earl of Halifax, had
been appointed first commissioner; and from this time
Lady Mary resided principally in London, where her wit
was in great requisition. Her beauty had been admired in
her childhood, and her husband had long been on terms of intimate
friendship with Addison and other eminent literary men of the
day, and in that society she moved with the same lustre as
for the circles of rank and fashion. In 1716, Mr. Wortley
Montagu was appointed ambassador to the Porte; and
in August of that year he set out for Constantinople, accompa-
nied by his wife. They remained abroad till October,
1718, and it was during this absence from her native coun-
try that Lady Mary addressed to her sister, the countess of
Mar, Mr. Pope, and other male and female friends, the
celebrated Letters upon which her fame principally rests.
The picture of Eastern life and manners given in these
letters is admitted by all who have since visited the Levant
not to be in general as correct as it is clear, lively, and
accurate; but the latter are invaluable for those who are
abroad not only in wit and humour, but in a depth and
sagacity of remark, conveyed in a style at once
flowing and forcible, such as has rarely proceeded from a
female pen. Although they were not written during her
life, they are undoubtedly written with a view
to publication; copies of all of them were preserved by
Lady Mary, and some time before her death she presented
two complete transcripts of them, the one, in her own hand,
to Mr. Johnson Swode, and the other she gave to "Des-
dam, 'to be disposed of as he thinks proper,' the other,
in a different hand, to Mr. Moleworth. Both these copies
were procured immediately after her death by her daugh-
ter, Lady Bute, the first-mentioned having been purchased
for the sum of 500l.; but it appeared that a transcript
had been previously taken (as Mr. Swode affirmed,
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Lady Mary's visit to Turkey, besides producing the Letters, is famous for having been followed by the introduction, through her means, into this country, and thence into the rest of Europe, of the practice of inoculation for the small-pox. [Inoculation.] Of the next twenty years of her life, which she passed in England, the most memorable incident is her quarrel with Pope, an affair which is involved in confusion of mystery, but in which it appears she bore the greater share of blame than the other party. During this interval also she composed a considerable quantity of verse, which was handed about society, and some of which got into print; but she had not much of the poetical temperament, and her rhymes, though not without sprightliness, contained nothing which could ensure them a long life. Among those of her performances in this line of greatest pretension were six satirical sketches, entitled 'Town Eclogues,' which have been often reprinted as a collection, or that many of which have been generally attributed to her, are in so free a style, as to make it necessary to exclude them from the modern editions of her works. For reasons, the nature of which is not well understood, she left England, without her husband, from whom however she seems to have parted on very good terms, although they never met again. She directed her course to Italy, where she lived first on the shores of the lake of Iseo, and afterwards at Venice, till 1761, when she was prevailed upon, by the solicitations of her daughter, to return to England. She only survived her return to her native country a few months, dying in a cancer in the breast, on the 21st August, 1762. Besides a son, the subject of the next article, she left a daughter, Mary Louisa, who married in 1791, Edward Bute (George III.'s celebrated minister), and who died in 1794.

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Notwithstanding all this prof igy and disregard of reputation, Mr. Montagu, having procured a seat in the House of Commons, retained it for two parliaments, till at last his extravagant expenditure involved him in such pecuniary embarrassments that he deemed it expedient to settle in Germany, and is now living a more retired life. But proceeding first to Italy, made himself remarkable there by becoming a convert to papery, and then transferring himself to Egypt, excited a still greater sensation by the translation and publication in French of M. d'Arlandes' Levant, having in the mean time been disintegrated by his father and mother; but he was on his way back to England when his death took place at Padua in 1776. Besides his early tract he wrote another entitled 'An Examination into the Causes of Those Ambiguities and Equivoques,' which is a work of great merit in every respect, and second edition of this publication appeared in 1817, containing some additional letters; but its value has been since entirely superseded by the publication of The Letters and Works of Lady Mary Worthy Montagu, edited by her great-grandson, Lord Weymouth, in 1798, London. Besides presenting the letters formerly printed in a much more correct shape, this publication contains several letters and other pieces which had not before been given to the world. In the preface Sir Philip Francis, chief of the Jacobites, defends himself from a new Life of Lady Mary, modestly entitled 'Biographical Anecdotes' (understood to be from the pen of Lady Louisa Stuart, the only surviving daughter of her daughter Lady Bute), which is as able and spirited as anything Lady Mary herself ever wrote, and must be considered as one of the gems of our literature.

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made a gentleman of the king's chamber and a knight of the order of St. Michael.

When he was three years of age Montaigne married François de la Chassaigne, in order, as he says, to please his friends rather than himself, for he was not inclined to a married life. He however lived on good terms with his wife till his death. He had only one daughter by his first marriage, who managed his own estate, on which he generally resided, and from which he derived an income of about £6,000 per annum.

In 1569 Montaigne translated into French a Latin work of Raymond de Sebonde or Sebon, a Spanish divine, on "Noblesse et pauvrete," in which he discussed the relations of civil and religious war, and Montaigne, disapproving of the conduct of the court towards the Protestants, and yet being a soldier and a Catholic, and by principle and disposition loyal to the king, was glad to live in retirement, and take no part in public affairs, by engaging both parties to moderation and mutual charity. By this conduct he became, as might be expected, obnoxious to both sides. The massacre of St. Bartholomew plunged him into a deep melancholy, for he detested cruelty and the shedding of blood. In equal about this dismal epoch of 1572 he began to write his "Essays," which were published in March 1580, and met with great success.

With the view of restoring his health, which was not good, Montaigne went up and down Switzerland and Italy. At Rome he was well received by several cardinals and other persons of distinction, and was introduced to pope Gregory XIII, and received the freedom of the city of Rome by a bull of the pope, of which he speaks. The condition of the city at that time was religious and political, with Rome; he there found himself at home among those scenes and monuments which were connected with his earliest studies and first impressions of his boyish years. He wrote a journal of his tour, evidently not intended for publication, but he wrote it for his own private use. The essay, as the word is used, and has been used by 15th century in an old chest in the château of his family, was published in 1774, under the title of "Journal du Voyage de Michel de Montaigne en Italie, par la Suisse et l'Allemagne, on 1580." It is one of the earliest descriptions of Italian life and manners.

While he was abroad he was elected mayor of Bordeaux by the votes of the citizens, an honour which he would have declined had not the king, Henri III, insisted upon his accepting the office. At the expiration of two years Montaigne resigned. On his retiring from office he returned to his patrimonial estate. The war of the League was then raging in the country, and Montaigne had some difficulty in saving his family and property from the marauding bands of the enemies of the crown.

At this time the plague also broke out in his neighbourhood (1586), and obliged him to leave his residence and wander about various parts of the country. He was at Paris in 1588, busy about a new edition of "Essays." It appears that during this time Montaigne was employed in negotiations with a view to conclude a peace between Henri of Navarre, afterwards Henri IV, and the duke of Guise. At Paris he became acquainted with Mademoiselle de Gournay, a young lady who had conceived a kind of sentimental affection for him from reading his book. Attended by her mother she visited him, and introduced herself to him, and from that time he called her "fille d'alliance," or adopted daughter, a title which she retained for the rest of her life, as she never married. Montaigne was then aged 43 years. This attachment, which, though warm and reciprocal, has every appearance of having been of a purely Platonic nature, is one of the remarkable incidents of Montaigne's life. At the time of his death Mademoiselle de Gournay was 46 years of age, and one of the most beautiful women in France. Understanding the civil troubles and the insecurity of the roads, to repair to Montaigne's residence and mingle their tears with those of his widow and daughter.

He returned to Paris in the latter part of 1588. Montaigne stopped at Blois with De Thou, Pasquier, and other friends. The States-General were then assembled in that city, in which the duke de Guise and his brother the cardinal were treacherously murdered, on the 23rd and 24th of December. Through the same year and the next seen that the civil dissensions could only terminate with the death of one of the great party leaders. He had also said to De Thou that Henri of Navarre was inclined to adopt the Catholic faith, but that he was afraid of being forsaken by his party; and that on the other side Guise himself would not have been averse from embracing the Protestant religion, if he could thereby have promoted his ambitious views. After the catastrophe Montaigne returned to his château.

In the following year he became acquainted with Pierre Charron, a theologian and writer of considerable reputation, and formed an intimate friendship with him. Charron in his book "De la Sagesse," borrowed many ideas from Montaigne's "Essays." Montaigne by his will empowered Charron to assume the coat of arms of his family, as he himself had no children. "He died of a great quintain, which kept him speechless for three days, during which he had recourse to his pen to signify to his wife his last wishes. He also requested that several gentlemen of the neighbourhood should be invited, in order that he might take leave of them. When they were all assembled in his room, a priest said mass, and at the elevation of the host, Montaigne balf raised himself up in bed, with his hands joined together as in prayer, and in that attitude he expired. The 13th of September, 1592, in the sixtieth year of his age. His body was buried at Bordeaux, in the church of the Feuillâns, where his widow erected a monument to him. Montaigne's "Essays" have been the subject of much conflicting criticism. If we consider the age and the intellect of the author, we must consider them a very extraordinary production, and it must be kept in mind that the author lived, we must consider them a very extraordinary production, and it must be kept in mind that the language. Literature was then at a very low ebb in France, the language was hardly formed, the country was distracted by feudal turbulence, ignorant fanaticism, deadly intolerance, and civil factions, and yet in the midst of all this a country, and a country living under the shadow of the law, and feeling itself belonging to the then rude, fierce, feudal aristocracy, composed a work full of moral maxims and precepts, conceived in the spirit of the antient philosophers of Greece and Rome, and founded on a system of natural ethics, on the beauty of virtue and of justice, and on the lessons of history; and this book was read with avidity amid the turmoil of factions, the din of civil war, and the cries of persecution and murder.

The moralist of the "Essays" has been called, and not unreasonably, though not correctly in the expression, a pagan morality: it is not founded on the faith and the hopes of Christianity, and its principles are in many respects widely different from those of the Gospel. Montaigne was an Epicurean, but he was not an Epicurean of the antient school in a great measure that of Seneca and other antient writers, whose books were the first that were put into his hands when a child. Accordingly, Pascal, Nicole, and other Christian moralists, while they do justice to Montaigne's talents and the many good sentiments contained in his work, are very severe upon his ethics taken as a system. A living moralist of our own time, Professor Vinet of Baile, has given a fair analysis of the spirit of Montaigne's ethics. (Essais de Pierre Charron, Paris, 1829.)"
order to clear themselves of the suspicions arising from their past errors, become violent, indiscreet, unjust, and throw discredit on the cause which they pretend to serve. And a few lines after, he modestly places himself in the second class, namely, of those who, disdaining the first state of uninformed simplicity, have not yet attained the third and last exalted stage, "and who," he says, "are thereby rendered inept, importunate, and troublesome to society. But I, for my part, endeavour, as much as I can, to fall back upon my first principles from which I should love to depart." In his chapter on prayers (b. i, 56), he recommends the use of the Lord's prayer in terms evidently sincere; and in the 'Journal of his Travels,' which was not intended for publication, he manifests Christian sentiments in terms of personal peace.

Montaigne has been censured for several licentious and some cynical passages in his 'Essays.' This licentiousness however appears to be rather in the expressions than in the meaning of the author. He spoke plainly of things which are not alluded to in more refined society, but he did so evidently without bad intentions, and only followed the common usage of his time. Montaigne combats most earnestly the malignant feelings frequent in man, in his countenance, in his race, and in his cruelty he detects, his whole nature was averse from it. His chapters on pedantry, on the education of children, on the administration of justice, and especially of criminal justice, are remarkably good. He also throws considerable light on the state of manners and society in France in his time.

The 'Essays' have gone through many editions; that of Paris, 3 vols. 4to, 1725, is the most complete. Verner published, in 1816, 'Notes et Observations pour faciliter la lecture de Montaigne,' 2 vols. 8vo, Paris. It is a useful commentary.

MONTANISTS, or CATAPHRYGIANS, a sect of Christians, which arose in Phrygia about 171 a.d. (Euseb. Church Hist. 170; Hist. Eccl. v. 3.). They have been called Montanists from their leader Montanus, and Cataphrygians or Phrygians from the country in which they first appeared.

Of the personal history of Montanus little is known. He is said to have been born at Ardaia, a village in Myasia, and to have been only a recent convert when he first made pretensions to the character of a prophet. (Euseb. Hist. Eccl. v. 16.) His principal associates were two prophetesses, named Prisca or Priscilla, and Maximilla. According to some of the ancient writers, Montanus was himself the founder of this sect; but his followers are the Paraclite, or Holy Spirit. Probably this is an exaggeration, but it is certain that he claimed divine inspiration for himself and his associates. They delivered their prophecies in an ecstacy, and their example seems to have had some influence. The sect was divided into two branches, one by Cyprian, and the other by Minucius. The former branch, which was more numerous, adhered to the sees of the orthodox, and the latter was more favored by the representatives of the church in Rome. The Montanists were chiefly distinguished from other Christians by the austerity of their manners and the strictness of their discipline. They condemned second marriages, and practiced fasts. They maintained that all flight from persecution must come under the censure of the church; but they did not forgive sins committed after baptism. They held the doctrine of the personal right of Christ on earth at the Millennium. They are accused by some of the early writers of embellishing mysteries attended with cruel and licentious practices, but it appears quite certain that these charges are unfounded.

The Montanists were warmly opposed by the writers of the Catholic party, though they were once countenanced for a short time by the bishop of Rome. Their name is not very well known, but who is supposed to have been Victor. Tertullian wrote several works in defence of their opinions. (Tertullian.)

The sect was numerous, and lasted a considerable time. They existed in the time of Augustus and Jerome, the latter of whom wrote against them.

MONTAGNE [Loiret.] MONTABAN, a town in the south of France, capital of the department of Tarn et Garonne, situated on the river Tarn just below the junction of the little river Tescou, in 44° 14' N. lat. and 1° 24' E. long.; 336 miles in a direct line south by west of Paris, or 408 miles by the road through Orleans. It is situated on a rocky, elevated site, and commands the rivers of the region.

The town was founded in A.D. 1144 by Count Alphonse of Toulouse. In the religious contests of the sixteenth century it was fortified by the Huguenot party, and resisted the attack of the Catholics, which occurred in 1569. In the following century, being still in the hands of the same party, it resisted the attack of Louis XIII., A.D. 1621, and did not submit until after the siege and capture of Rochelle, A.D. 1629. Its fortifications were soon after destroyed. It suffered much from the devastations of Louis XIV., but is still one of the chief seats of the reformed religion in France.

The town is in a pleasant situation, partly upon a gentle slope. It is a handsome place, and is considered healthy. The streets are well laid out and clean, and the houses, which are of brick, are in general well built. There is a handsome square in the centre of the town, with a piazza of two tiers of arches, ornamented with Doric pilasters. The place is called the square of the sovereign's garden. There are besides two handsome public walks, with a raised terrace between them, from which there is a fine view of the Pyrenees, distant 130 or 140 miles. There is a fine cathedral erected at a very early period. The upper public galleries are reserved for ladies, especially the town-hall and the bishop's palace. There is a bridge built of brick over the Tarn, which is here navigable, and runs through the town, dividing it into two parts. There are numerous small streets.

The population in 1831 was 18,255 for the town, or 25,460 for the whole commune; in 1836 it was 27,363 for the commune. There are a considerable number of manufactories of common woollen cloth, kersey, serge and other woollen goods, silk stockings, and cards for dressing woollen goods: there are also soap-houses, potteries, brimstone distilleries, ten-yards, and dye-houses. It is a great mart for corn and common woolens. There are five fairs in the year, three of which are continued for eight days each. The navigators of the Tarn and the Garonne affords ready communication with Bordeaux. The town has a theatre, a public library of 10,000 volumes, baths, and excellent inns. The surrounding country abounds with excellent fruit, fish, poultry, and fowls. The climate of the place is considered equal to that of Toulouse, and the wines of Montbarier, Fau, Auras or Aussac, and Avillier, obtained from the vineyards round the neighbouring town of Castel-Sarson, are the best in the Languedoc. The town has produced some writers of considerable repute.

There are subordinate courts of justice, a commercial court, several fiscal or administrative government offices, and societies for the promotion or direction of manufactures and agriculture. There are the theological seminaries for Protéans and a Protestant Auxiliary Bible Society; a society of agriculture, science, and the belles-lettres; a highschool, a free drawing-school, and a maternity society.

Montauban is the seat of a bishopric; the diocese contains 316 parishes, and no pontifical college. The bishop is a suffragan of the archbishop of Toulouse and Narbonne.

The arrondissement of Montauban has an area of 619 square miles, and comprehends 62 communes. It is subdivided into three cantons or districts, each under a justice of the peace. The population in 1831 was 107,852; in 1836 it was 106,792.

MONTBERIARD. [Doubs.] MONBRISON. [Loire.]

MONCABER [Armes DE. [Wolfe, General]

MONCADA. [SOMME.]

MONCAECIINO is the name of a celebrated monastery in the kingdom of Naples, in the province of Terra di Lavor, near the borders of the Papal state. It is situated upon the summit of a mountain, deep and inaccessible, about 1500 feet above the offset of the Apennines, and which rises above the valley of the Frigido, an affluent of the Liris. The town of San
Germano, which is built at the foot of the mountain, partly occupies the site of the antique Casinum, a town of the Volsci, and subsequently a Roman colony, which was sacked by Hannibal's troops on their march from Capua towards Rome. Remains of the antique town are still seen, including an amphitheatre, a theatre, and several sepulchral monuments. It was in a much higher state, and Mounier refers to this spot, and began the foundation of this celebrated monastery, which afterwards became the head-quarters of his order. [Benedict, Saint.] The monastery was destroyed, according to the Longobards about the year 883, was restored more than a century after, and became more magnificent than before, being enriched by gifts from various princes. Ratchis, king of the Longobards, as well as Carroson, brother of Pepin, king of the Franks, retired to Monte Cassino, whose army was destroyed when the monastery was again destroyed by the Sarscenos, A.D. 884, but was restored in the year 949. The age that followed was a period of the greatest splendour for the monastery: the abbod was a powerful feudal baron, who had jurisdiction over an extensive territory, and inhabited in the quarters of the neighbouring princes and of the Normans. The abbod Desiderius, afterwards pope Victor III., rebuilt the church of the monastery in the year 1066, and a numerous assembly of bishops assisted at its consecration. The bronze gates were wrought in the most dignified manner at Constantinople, and which are still seen, exhibit in silver inlaid letters a list of all the tenures, castles, fiefs, and lands possessed by the abbey at that time. The abbots were the chief of the entire monastic institution, which was bestowed in commendam on several cardinals in succession. The last commendatory or titular abbod was Giovanni de Medici, afterwards pope Leo X., after which the regular election of abbots was restored. The abbod was elected by the monks, during which he was also bishop of San Germano and the adjacent district. He was first baron of the kingdom of Naples, enjoyed ample privileges, and went out generally in a coach and six horses. At the expiration of the six years, he returned to his former condition. In the gaud of the abbots, the power of the order along the same time a mark of his dignity, and he had precedence in great religious ceremonies.

The revenues of the abbey were 100,000 ducats, about 17,500l. sterling. With the monks supported not only their own community, which consisted of about thirty professed members, besides lay brothers or servants, but also extensive auxiliary establishments, such as the hospice at the foot of the mountain, where sick and aged monks were kept, and travellers were entertained; and a seminary in the town of San Germano dedicated to saint episcopal see.

Among other literary men who visited, at various times, the monastery of Monte Cassino, chiefly for the sake of its library, are Dante, Petrarch, the Pisan and military talents of his time. Monte Cassino has been the birthplace of many of the accounts of whom may be referred to for the condition of that institution in their respective epochs. Swinburne and other travellers of the last century have given an account of Monte Cassino as it was before the French revolution.

After the French occupied the kingdom of Naples in 1806, they suppressed all the wealthy convents, abolished among others the feudal rights of Monte Cassino, and seized its lands and property, but the rest of its now a brilliant establishment, as well as those of Monte Vergine and the Casinum, with a few monks in each to take care of the valuable archives and libraries of those institutions. King Ferdinand, after his restoration in 1815, gave back to the monastery of Monte Cassino all its lands and property, which was preserved, and the monastery has now a revenue of 24,000 ducats, about 4,000l. sterling, and is inhabited by about 15 monks. The last account we have seen of Monte Cassino is by the Hon. Keppel Craven, in his Interesting Excursions in the Abruzzi and the Marches of Ancona, London, 1829, from which we derive the following description.

The vast structure, every side of which exhibits long rows of windows, covers the whole platform of the detached and conical mountain, the grand height of the building of the walls on all sides, from which the whole is visible to the sands down to the sea. Some of the adjoining buildings have been converted into enclosed grounds, and furnished with fruit-trees and timber of larger growth. The edifice is built of small stones, covered with a reddish-gray stucco, of a sober yet not dull hue. The road to the monastery winds in a zigzag up the mountain, and gives access to the buildings through an archway cut in the rock and double gate leading into a large court, followed by two other of equal dimensions, communicating with each other by open arcades. The middle court is provided with a large cistern, and from one of its extremities a handsome flight of steps ascends to the quadrangle before the church, which stands on a very high raised platform. The more ancient cloisters, the arches of which are supported by fine granite columns, brought from the ruins of Casinum. Marble statues of the principal benefactors of the community are placed on the sides of the cloisters. The church is very handsome, rich in marbles, and ornaments, and contains with several interesting sepulchral monuments; amongst others, that of Piero de Medici, the son of Lorenzo the Magnificent, who was drowned in the Liris after the defeat of the French, and the tomb of the Guecchi. The font is of Carrara marble. The ceiling and lateral chapels are painted by Luca Giannino and other Nepotele and Sicilian painters. The organ is one of the finest in Italy. The seats in the choir are of walnut and oak wood, richly carved. The church is kept remarkably clean, and in this respect it reminds the traveller of St. Peter's at Rome. The rest of the monastery is grand and imposing, but not magnificent, being distributed internally in a style of simplicity which corresponds with the original institutions of the order. The contrast between the buildings of the cells and the church and the magnificence of the public or communal part of the building, such as the courts, porticoes, church, chapter, and refectory, is characteristic of the old spirit of the community: in the community was everything and the individual nothing.

The library of Monte Cassino, which is now kept in very good order, contains 18,000 volumes, among which are some rare editions of the fifteenth century. The archives contain a valuable collection of MSS., charters, grants, &c., of emperors, kings, and Longobard dukes, as well as papal bulls; many of the charters belong to the ninth century, and some MSS. to the sixth century; a curious letter of Mahomet II. to Pope Nicholas V., with the answer of the papal nuncio, a letter of the Emperor Albert of Bavaria to the King of Naples, and several letters of William of Montfaucon, Muratori, and other learned philologists. (Valdery, Voyages en Italie.) There is also a small collection of antiquities, inscriptions, and a chair of 'rosso antico,' of exquisite workmanship, which was found in the neighbourhood.

MONTECUCULI, RAYMOND, COUNT DE', Prince of Molf, Knight of the Golden Fleece, and Generalissimo of the Imperial armies, was born at Modena in 1608, of a noble family of that name. Following his father, some of its members, he entered the service of the house of Austria in the Thirty Years' War; and after bearing arms as a simple volunteer under one of his uncles, and rising through the usual gradations of rank, he first signalized his military talents in the memorable battle of Parnawa, in 1627, in which the Swedes under the celebrated Bancker, near Prague. He is said to have beguiled the two years of his captivity in cultivating the taste for letters which he subsequently excited; and, after his release, he resumed his service, with increasing reputation, in the defence of Silesia and Bavaria, and in the defeat of the Swedes under Wrangel at Trierbel, in 1647; until the termination of hostilities, by the peace of Westphalia in the following year, enabled him to revisit his native duchy. There, at the marriage festivities of the Duke Francesco I., he had the misfortune to offend some of his nearest friends, Count Mancusi, in a tournament; perhaps the latest recorded catastrophe which attended the dangerous games of chivalry.

In 1647 Montecuculi was sent by the emperor to assist John Casimir, king of Poland, against Rugotzki, prince of Transylvania, and the Swedes, whom he drove out of Poland, and compelled to conclude a peace. He was subsequently employed in Hungary in the war, of which he had given himself full share, between the Imperialists and the Turks; and in 1664, he set forth to decide a victory over the latter at St. Gothard as to compel them to sue for a truce of twenty years.

In 1673 he reached the climax of his fame by being opposed to the illustrious Turenne, in the war between the empire and France on the Rhenish frontier. He direction.
balanced operations of these two great generals, who, with-out committing the event to a battle, displayed more science in marches and encampments than other commanders have exhibited in a whole life of victories, were the admiration of their contemporaries; and when the fall of Turenne by a chance shot, in 1675, gave free scope to the genius of his opponent, Louis XIV, could find no one but the great Condé competent to arrest the progress of Montecuculi. Another most able though indecisive campaign closed the services both of Condé and Montecuculi: the latter of whom, claiming no victory, deemed it his highest honour to have encountered without defeat the two greatest French generals of their century. The remaining few years of his life were spent in retirement at the Imperial court, and he died in 1680.

As a general, Montecuculi was accused of excessive ca-tion and want of enterprise, qualities which he himself held to be no reproach. He had profoundly studied the art of war; and the memoirs which he composed upon its general principles and practice, as well as upon the conduct of warfare against the Turks, and on the operations of the Turkish war of 1661-1664, still retain their value, not only as the most interesting and instructive records of the marti-ral efforts of the year, but for the soundness of the maxims which they contain, applicable to all ages of the military art. He was a zealous and generous patron of letters, as well as a great strategist; and to him principally the Academy of Naturalists at Vienna owes its existence.

A good French translation of the Memoirs of Montecuculi was published at Amsterdam, in 1732, with a 'Life of the Author' prefixed.

MONTÉGO-BAY. [JAMAICA]

MONTÉLIMAR, or MONTÉLIMART, a town in France, capital of an arrondissement in the department of Drôme, situated at the junction of the Jabron and the Roubion, two small streams which flow into the Rhône a little below the town, in 44° 33' N. lat. and 4° 44' E. long., 381 miles from Paris by Sene, Auxerre, Lyon, Vienne, and Valence.

The itinerary from Burdigala to Hierosolyma (Bordeaux to Jerusalem), and the Théodose or Peutinger Table, mention a place, Acunum, on the road between Valenta (Clermont) and Nauma (Naumburg). It is said that this is repeatedly mentioned in the annals of a Roman colony, Acusio, in the country of the Cauves. These two places are considered as identical, and some geographers fix them on the site of Montélimar; but Belville prefers to fix them at Anceaux, visible near Montélimar, on the bank of the Rhône. It is at any rate probable that Montélimar rose on the decay of the Roman town. In the religious wars of the sixteenth century it was taken by the Huguenots, who had a considerable party in this region, and who were led by a young Catholic, who said it was not till the reign of Henri IV. that internal peace was restored.

The town is delightfully situated in the midst of hills, covered with vines and mulberry and other fruit trees. It is about 65 miles distant from Grenoble, which has no strength without. The town gates face the four cardinal points. The ruins of an ancient citadel command the place. Several canals traverse the town, and the road from Lyon to Marselle runs through the best built and pleasantest quarter. There is a stone bridge over the united streams of the Roub-ion and the Jabron.

The population in 1831 was 5816 for the town, or 7560 for the whole commune; in 1836 it was 7965 for the commune. As a watering-place, it has the following springs: a little hody, carbonates, and excellent morocco, amongst others. Travellers are supplied with coffee, tobacco, and all the necessaries of the road. There is a tolerable hospital, and the whole town is supplied with wine, beer, coffee, and all sorts of provisions. The town is on the road from Grenoble to Paris, and is situated about 36 miles from Grenoble, and 34 from Cluny.

The population in 1831 was 62,530; in 1836 it was 64,612.

MONTEM

MONTEM, the ancient custom of a prococ-

sion of the scholars of Eton school in Buckinghamshire anzmonte. It has been made every third year on Whit-Tuesday, to a tumulus near the Bath road, which has acquired the name of Salshill, by the Turks the neighbourhood of this has been long known. The chief object of the celebration is to collect money for salt, as the phrase is, from all persons present, and it is exacted even from passengers travelling the road. The scholars who collect the money are called salt-bearers, and they are followed by a procession inscribed with some motto, such as Ad Montem, Mos per: Lege, or Pro More et Monte, by way of pass-word, are given to such persons as have already paid for salt, as a security from any further demands.

This custom has been frequently honoured with the presence of the king and queen, and the royal family, whose liberal contributions, added to those of many of the nobility, and others, who have been educated at Eton, have so far augmented the general collection, that it has been known to amount to near 1000L. The sum so collected is given to the senior scholar, who is going off to Cambridge, for his support at the university. It would be in vain perhaps to trace the origin of all the circumstances of this singular custom, which has been in use from time immemorial. The procession itself seems to be coeval with the foundation of the college, and it has been conjectured with much probability that it was that of the Baun, or Boy-bishop. It originally took place on the 17th of December, the feast of St. Nicholas, the patron of children, being the day on which it was customary at Salisbury, and in other places where the ceremony was observed, to elect the Boy-bishop from among the children belonging to the cathedral. It is only since 1733 that the time of the celebration of the Eton Montem has been changed. It was formerly a part of the ceremony that a boy dressed in a clerical habit, with a wig, should read prayers.

(Huggett's M.S. Collections for a History of Windsor and Eton Colleges, in the British Museum; Lysons's Magna Britannica, vol. i., p. 555; Brand's Popular Antiquities, 4th edit., vol. i., p. 337-349.)

MONTENEGRO, [MONTENERO]

MONTENEGRO, 'the black mountain,' so called on account of the dark foresters which cover its sides, is the name given by the Venetians, and adopted by European geographers, to a mountainous district forming part of the high land of Albania, and situated on the borders of Hera-govina, and of the former Venetian, and Austrian, territory of Cattaro. An offset of the chain which bounds Albania to the north, the Mount Bertiscus and Scardus of the antients, runs in a southern direction between the sources of the Narenta and the Moraks, and forms the southern boundary of the Venetian province of Herzegovina. On reaching the innermost recess of the deep gulf of Cattaro, north-east of the town of Perasto, this ridge divides into two branches, one to the north west and the other to the south-east, both of which advance to the blue and white mountains without being interrupted. The basin of the gulf of Cattaro with its several bays and the territory around, which constitutes the Austrian districts of Castelnuovo, Risano, Perasto, Cattaro, Budua, and Pastro-vich. To the east of the main ridge, and north-east of the Austrian territory, lies the district of Montenegro, consisting of several high valleys sloping to the south-east, the waters of which flow into Turkish Albania by two streams, the Schiniza and the Rivo-covenovitch, both affluents of the lake of Cattaro. The length of this mountainous and little known district is reckoned to be about thirty miles. Many willow and thorn trees are found in these districts, which are thickly covered with the finest species of medlar quality are found, and there is a tolerable copious medicinal spring. Fojuda de St. Fond, the geolo-gist, was a native of Montenart.

There are a subordinate court of justice, one or two fiscal guards, and a high and noble library containing 3000 volumes, and a collection of chemical and philosophical apparatus.

The arrangement has an area of 436 square miles, and corresponds 66 communes. It is subdivided into five cantons or districts under the following names: 1. Kajen. The population in 1630 was 62,530; in 1836 it was 64,612.
several villages, Oenichich, Optocechi, Dobracbi, &c. (Carte des Bouches de Calatoo et de Montenero, by Max. de Trax, an Austrian engineer. Vienna, 1808.)

The inhabitants of Montenero, or Montenegro, are a Slavonic people, and speak a dialect of the Slavonian. They call their country Czerna Gora. They belong to the Eastern church, and are governed by their Wiadiks, or bishop, assisted by a council of the chief families. All the men are armed, and extremely jealous of their independency. They live chiefly on corn, and have some little barley; but little corn, and has good pasture for cattle, and much timber. The Montenegrins are given to plunder, and they now and then make predatory incursions into the Turkish territory, and the way of Venice with the Turks they acted as auxiliaries, though at times troublesome ones, of the former power.

In 1757 an adventurer made his appearance among them, who gave himself out for Peter III., emperor of Russia, and created considerable disturbance for a time. After the fall of Venice in 1797, Cattaro was given up to Austria. By the treaty of Presburg in 1805 it was ceded to France; but before the French garrison could reach that district, the natives, join'd to the Montenegro, excited by a Russian agent, committed a massacre; were omitted; and having destroyed the Turk's village in the other towns. This served to the French as a pretext for taking forcible possession of the neighbouring republic of Ragusa. But the Montenegro came down from the mountains, and besieged General Lauriston within the town of Ragusa. A desperate fight ensued between the Montenegrins and the French commanded by Marmont, Lauriston, and Molitor, in which no quarter was given; until the French at last took possession of Cattaro, and drove the Montenegro back to their mountains. (Boita, Storia d'Italia, b. 22.)

Since 1814 the Montenegrins are nominally under the protection of Austria, to whom they are occasionally a source of trouble, on account of their incursions into the Turkish territory, and the constant complaints of the Turkish authorities. A French traveller, Sommeries, has written a Voyage Historique et Politique à Montenero, 2 vols. 1820.

MONTEREAU. [SHINtE A AINRnE]

MONTÉRÉE [MEXICAN STATE]

MONTEREY, BARON DE SECONĐA

MONTEVERDI, ARENDE DE, ET DE, was born on the 18th of January, 1569, at the Château de la Brède, in the immediate neighbourhood of Bordeaux. He was descended from a noble and otherwise distinguished family of the province of Aquitania. He was the son of a wealthy officer of the Church in Bordeaux in 1714, and three years afterwards, on the death of a paternal uncle, he succeeded at the same time to his fortune and to his post of président à mortier in the parliament of Bordeaux, a post which Montesquieu himself afterwards filled. His father entered the same service, but quitted it early. The nobility which Montesquieu obtained was conferred upon his great-grandfather by Henry IV.

Montesquieu gave in youth the promise of his future fame. His habits were most studious, and his desire for learning was encouraged in every way by a fond and judicious father, who was always himself a refuse letter of the contents of the book were such that the minister could approve of, that several letters by another hand were inserted by the printer of the book. The writer of the life of Montesquieu, in the 'Biographie Universelle,' rejects D'Alembert's account, and, admitting that Montesquieu's passages are forgeries, he goes on to say that the minister could approve of, that several letters by another hand were inserted by the printer of the book. The writer of the life of Montesquieu, in the 'Biographie Universelle,' rejects D'Alembert's account, and, admitting that Montesquieu's passages are forgeries, he goes on to say that the minister could approve of, that several letters by another hand were inserted by the printer of the book. The writer of the life of Montesquieu, in the 'Biographie Universelle,' rejects D'Alembert's account, and, admitting that Montesquieu's passages are forgeries, he goes on to say that the minister could approve of, that several letters by another hand were inserted by the printer of the book. The writer of the life of Montesquieu, in the 'Biographie Universelle,' rejects D'Alembert's account, and, admitting that Montesquieu's passages are forgeries, he goes on to say that the minister could approve of, that several letters by another hand were inserted by the printer of the book. The writer of the life of Montesquieu, in the 'Biographie Universelle,' rejects D'Alembert's account, and, admitting that Montesquieu's passages are forgeries, he goes on to say that the minister could approve of, that several letters by another hand were inserted by the printer of the book. The writer of the life of Montesquieu, in the 'Biographie Universelle,' rejects D'Alembert's account, and, admitting that Montesquieu's passages are forgeries, he goes on to say that the minister could approve of, that several letters by another hand were inserted by the printer of the book. The writer of the life of Montesquieu, in the 'Biographie Universelle,' rejects D'Alembert's account, and, admitting that Montesquieu's passages are forgeries, he goes on to say that the minister could approve of, that several letters by another hand were inserted by the printer of the book. The writer of the life of Montesquieu, in the 'Biographie Universelle,' rejects D'Alembert's account, and, admitting that Montesquieu's passages are forgeries, he goes on to say that the minister could approve of, that several letters by another hand were inserted by the printer of the book. The writer of the life of Montesquieu, in the 'Biographie Universelle,' rejects D'Alembert's account, and, admitting that Montesquieu's passages are forgeries, he goes on to say that the minister could approve of, that several letters by another hand were inserted by the printer of the book. The writer of the life of Montesquieu, in the 'Biographie Universelle,' rejects D'Alembert's account, and, admitting that Montesquieu's passages are forgeries, he goes on to say that the minister could approve of, that several letters by another hand were inserted by the printer of the book. The writer of the life of Montesquieu, in the 'Biographie Universelle,' rejects D'Alembert's account, and, admitting that Montesquieu's passages are forgeries, he goes on to say that the minister could approve of, that several letters by another hand were inserted by the printer of the book. The writer of the life of Montesquieu, in the 'Biographie Universelle,' rejects D'Alembert's account, and, admitting that Montesquieu's passages are forgeries, he goes on to say that the minister could approve of, that several letters by another hand were inserted by the printer of the book. The writer of the life of Montesquieu, in the 'Biographie Universelle,' rejects D'Alembert's account, and, admitting that Montesquieu's passages are
The writings of Montesquieu show much variety of talent. Even if the "Esprit des Lois" had not been written, the author of the 'Lettres Persanes,' remarkable for their refined humour, and of the 'Temple du Génie,' an exquisite instructive monument which would not have been forgotten. And without disparaging at all the merits of Montesquieu's great and best known work, it may be said that these smaller productions are much more perfect in their kind than is the "Esprit des Lois," - a conclusion on which there is no difference of opinion. The greatest of these works is its agreeable style, its various knowledge, its ingenuous and at the same time sensible mode of treating the art of government, and its enlightened advocacy of what, not very definitely nor consistently, is called the public interest. The merit of the book is greater on account of the time at which the work appeared. The defects of the work, on the other hand, are want of system, shallowness, not so much of knowledge as of thought, and (what is at once a sign and a consequence of this shallowness) an undue exaltation of experience over principles. The time again at which the work appeared will serve in the way of extenuation of these defects; and it is to be remembered also that the plan of the work is profane indeed.

The "Esprit des Lois" has given occasion to a work by M. Destutt de Tracy, which, though partaking in some degree of the vagueness of Montesquieu's work, is very valuable both in itself and as a commentary on the "Esprit des Lois." It is under the title "La Constitution et le Contrôle des Lois." MONTEVIDEO, or S. FELIPE DE MONTEVIDEO, is the capital of the republic of Uruguay, or Banda Oriental, in South America. It is situated in 34° 55' S. lat. and 56° 10' W. long., and built on a small promontory, which forms the entrance of a bay, the channel of which, when projecting point is connected with a hill, from which the town has received its name. It is 130 miles from Cape S. Mary, which forms the northern point of the entrance of the La Plata river, and opposite the town the river is still 70 miles wide, and more than 2 miles wide, but too shallow for large vessels; it is also exposed to the pamperos, or south-western winds, which blow over the extensive plains called pamperos with exceedingly great violence. Without Commentaries on the broad estuary of the La Plata river. The town is in general well built, the streets being wide, straight, and intersecting each other at right angles; they are paved, and have narrow footways. The houses are built with taste, and have flat roofs and parapets. The cathedral, dedicated to the apostles S. Felipe and S. Jago, is not distinguished by its architecture, nor are there any other public buildings of note. Montevideo is a very healthy place, but suffers from want of wood and water. The capital city is much more than 4,000 long and more than 2 miles wide, but too shallow for large vessels; it is also exposed to the pamperos, or south-western winds, which blow over the extensive plains called pamperos with exceedingly great violence. Without Commentaries on the broad estuary of the La Plata river. The town is in general well built, the streets being wide, straight, and intersecting each other at right angles; they are paved, and have narrow footways. The houses are built with taste, and have flat roofs and parapets. The cathedral, dedicated to the apostles S. Felipe and S. Jago, is not distinguished by its architecture, nor are there any other public buildings of note. Montevideo is a very healthy place, but suffers from want of wood and water. The capital city is much more than 4,000 long and more than 2 miles wide, but too shallow for large vessels; it is also exposed to the pamperos, or south-western winds, which blow over the extensive plains called pamperos with exceedingly great violence. Without Commentaries on the broad estuary of the La Plata river. The town is in general well built, the streets being wide, straight, and intersecting each other at right angles; they are paved, and have narrow footways. The houses are built with taste, and have flat roofs and parapets. The cathedral, dedicated to the apostles S. Felipe and S. Jago, is not distinguished by its architecture, nor are there any other public buildings of note. Montevideo is a very healthy place, but suffers from want of wood and water. The capital city is much more than 4,000 long and more than 2 miles wide, but too shallow for large vessels; it is also exposed to the pamperos, or south-western winds, which blow over the extensive plains called pamperos with exceedingly great violence. Without Commentaries on the broad estuary of the La Plata river.

His first work was a supplement to Cotelierus, entitled "Analecta Graeca," 4to, Paris, 1665, with notes by him and the fathers Anthony Pouget and James Lopin. In 1690 his "Philos. Sacra," was published in 4to, Paris, 1691, with notes by him and James Lopin. His next important work was a new edition of St. Athanasius, in Greek and Latin, 3 vols. folio, a labour which established his reputation as a profound scholar.

In the same year Montfaucon, who had turned his thoughts to more extensive collections of antiquities than he had then appeared, determined to visit Italy for the purpose of consulting the manuscripts in the Italian libraries. In this pursuit he passed three years, and upon his return in 1702, published the result of his journey and researches in his "Diarium Italicum."

During Montfaucon's residence at Rome he held the office of procurator-general of his congregation at that court; and while there, in 1699, published a little volume in vindication of the Benedictine edition of the west of Augustin, in 11 vols. folio, the publication of which had been begun by some able men of his Order, at Antwerp, in 1679, and was not completed till 1700. In 1706 Montfaucon published a supplement to two volumes of his "Psalms," and an attempt to prove that the Thaumaturges, of whom Philo speaks were Christians; and in 1710 an "Episcopos" on the fact mentioned by Rufinus that St. Athanasius baptized children when himself a child. This was followed by another interesting work, "Lettres d'Hercaple de Origen," 2 vols. folio, and an edition of the works of St. Chrysostom, begun in 1718, and completed in 1738, 13 vols. folio.

In 1715 he published his "Bibliotheca Cosmiana," 4to, Paris; and in 1719, the year in which he was chosen a member of the academy of Belles-Lettres, he published his great work, entitled "L'Antiquité Expliquée et Représentée en Figures," Paris, 5 vols. folio, to which, in 1724, was added a Supplement in 5 vols. This was followed by another interesting work, "Lettres du Monarque François," 5 vols. folio, Paris, 1729-1733. His last and not the least important of his works was his "Bibliotheca Bibliothecarum MSS. nova," 2 vols. folio, Paris, 1739. Montfaucon died suddenly at the Abbey of St. Germain de Pres, December 11, 1741, at the advanced age of eighty-seven.

Besides the works already enumerated, he contributed many curious and valuable essays on subjects of antiquity to the Memoirs of the Academy of Inscriptions and Belles-Lettres, as well as to other literary journals. (Moret, Dict. Hist.; Charlet, Dict. des Antiquités, 340-303.)

MONTFERRAND. [CLERMONT.]

MONTFLANQUIN. [LOT ET GARONNE.]

MONTFORT. [ILLE ET VILAINE; SHIRE ET OISE.]

MONTGOMERY. [HUNNY III.]

MONTGOLFIER. [BALLOON.]

MONTGOMERY. [MONTGOMERYSHIRE.]

MONTGOMERYSHIRE, a county of North Wales, bounded on the north by Denbighshire, on the east and south-east by Shropshire, on the south by Radnorshire, on the south-west by Cardiganshire, and on the west and north-west by Merionethshire. Its form is compact, and approximates to that of an oblong quadrangle, having its sides respectively facing the north-east, north-west, south-east, and south-west. The length from north-east to south-west varies from 23 to 40 miles; the breadth from 19 to 33 miles. The area of the county is estimated at 839 square miles; it is the second of the Welsh counties in extent, being inferior only to Caernarvonshire; in density of population it is the ninth, being inferior to Car- danewshire, but exceeding Brecknockshire. The county, which gives name to the county, is 150 miles from London, in a direct line north-west; 168 miles by the road through Worcester, Tenbury, Ludlow, and Bishop's Castle; or 174 miles by the road through Hereford, Ludlow, and Bishop's Castle.

Surface and Geology.—Montgomeryshire is entirely an inland county, and belongs wholly to the mountainous tract of Wales. The westward border toward Merioneth.
shire is occupied by the Berwyn Mountains, and when these form two branches enclosing the valley of the Dovey, the south-eastern branch belongs in great degree to Montgomeryshire. It separates the basin of the Dovey from that of the Severn. The south-eastern border is occupied by the heights which extend from the neighbourhood of Shrewsbury across Clun Forest to Rhayader in Radnorshire. Irregular branches from these two principal chains occupy the intermediate parts of the county, and separate the main streams of waters varied by the various streams that flow into the Severn, the basin of which the whole county belongs, except that part which is enclosed between the two branches of the Berwyn chain, and which belongs to the basin of the Dovey. Lastly, Montgomeryshire on the north-west, the county of Moel Angl, Bwich-y-Felchwy, Myndyl Cwcomes, and Moel Fe, in the Berwyn chain; and the Breiddin hills (Moel Golpha, Moel Fammau, and Cefn Cystyll) about 1200 feet high; Long Mountain, 1339 feet; Kerry Hill, and Llanfach unit Mountain, 1992 feet high, in the chain that skirts the Shropshire and Radnorshire border. Plininlimin belongs to the Berwyn chain, and is partly in this county, but its summit (2463 feet) is just within the border of Cardiganshire.

The county is almost entirely occupied by the slate rocks which overspread so large a portion of Wales. The principal exceptions are the Breiddin hills, which are composed of rocks of very varied character, granite, greenstone, and coal measures; and the eastern part of the county, near the junction of the Severn and the Vyrnwy, where the red sandstone, or red marl of Cheshire and Shropshire, is found. The mineral treasures are not very abundant. Lead and zinc are procured from mines near Llangollen and Shrewsbury, which are visited by the valley of the Tanat or Tana; lead in the Berwyn mountains near Plininlimin, and copper and zinc between Llanfyllin and Oswestry, on the Shropshire border. Millstones are quarried in the Breiddin hills; stone for other purposes, slate and brick, are taken from the Pontcysyllte and the rather inferior quality at Llangynog in the vale of the Tanat, at Llanwddyn in the vale of the Vyrnwy, in the hills near Llanfach, and at Machynlleth; and a little coal and limestone near the border of Shropshire.

**The Severn** is the principal river of the county; it rises just within the border towards Cardiganshire, on the eastern side of Plininlimin, and flows east about twelve miles to Llanfach, receiving, at that town the Clywedog, a river of about the same length as the Severn itself, and a number of small brooks. From Llanfach the Severn flows north-east in a winding channel about thirty-eight miles, past Newtown and Welsh Pool, to the junction of the Vyrnwy on the border of the county town, Shrewsbury, on the left bank. The Tanat rises near the Vyrnwy the Severn quits the border to enter Shropshire.

Between eight and nine miles below Llanfach it receives the Tirannon, eleven or twelve miles long, and the Afon Gurno, of about the same length; about nine miles above it receives the land on long border about five miles lower still the Rhw is, which is seventeen or eighteen miles long, and the Camlet, about twenty miles long; this last rises in Shropshire near the hill called Stiper Stones, six miles west-north-west of Church Stretton. All these streams, the Male and the Camlet, may be considered as the source of the Severn, which at Newtown joins the Severn on the left bank. That part of the course of the Severn which lies in Montgomeryshire or on the border may be estimated at fifty-one miles.

The Vyrnwy rises on the border near Bwich-y-Paw, and receives a number of small streams, as the Evan, the Afon Gedig, the Afon Gynnau, the Glasgow, and the Cowin; it flows south-east in a winding channel twenty-two miles to the junction of the Twech, twenty-one miles long, which rises near Machynlleth and is called Llanfach. From the junction of the Twech the Vyrnwy flows nine miles till it receives the Can, eleven or twelve miles long, from above Llanfach; and about a mile lower down the Tanat. The Twech joins it on the right, the Tanat on the left bank. The Tanat rises near Bwich-y-Pawn on the Merionethshire border, and flows east-south-east into the Vyrnwy, chiefly in Montgomeryshire, partly on the Denbighshire border, and for two or three miles in Shropshire; it receives the River, the Afon Tanat near the Tanat and the Vyrnwy, and the Tanat and the Vyrnwy, from the junction of the Tanat the Vyrnwy flows about 9 miles further to its junction with the Severn; its whole course is about 45 miles.

The southern part of the county is watered by the Wye, an important tributary of the Severn, which rises on the south-east side of Plininlimin near the source of the Severn, and flows south-east for fifteen or fourteen miles into Radnorshire, receiving by the way the Tarrenig, the Bidno, and the Nant-y-Darrel.

The Dovey chiefly belongs to Merionethshire. [Mawrthwyn.] It enters Montgomeryshire about four miles below Dinws-y-Flud y and flows about 12 miles into the neighbourhood of Machynlleth, where it again touches Merionethshire. Its remaining course is between Merionethshire on the north-west, and Montgomeryshire and Cardin

Of the rivers only the Severn and the Dovey are navigable in that part which belongs to this county. The navigation of the Severn begins at Welsh Pool; that of the Dovey in the neighbourhood of Machynlleth; the length of the Severn navigation in or upon the border of this county is about eleven miles; that of the Dovey five or six miles.

The only navigable canal is the Montgomeryshire canal, which was commenced under an act obtained A.D. 1794. It commences in the county at Newtown, and runs through the valley of that river past Welsh Pool, about four miles below which it quits the immediate neighbourhood of the Severn, and runs northward to Llanymynech and Llangyblod will in Cardiganshire, where it joins the river of the Elymesmore canal. Its whole length is twenty-seven miles, entirely in this county; it has a short branch below Welsh Pool to Gwilsfield.

The principal roads which pass through this county are those from London by Shrewsbury to Caernarvon, Bangor, Towyn, and Aberystwyth. The road to Caernarvon crosses the north-eastern side of the county near the Denbighshire border, through Llanfyllin and Llangynog to Bala in Merionethshire. The Barmouth road passes through the county from Llanfach to Dinws-y-Mwydd and in Merionethshire: that to Town branches from the Barmouth road between Welsh Pool and Llanfach, and runs through Llanbrackmaer and Machynlleth. The Aberystwyth road passes through Montgomery and along the valley of the Severn and the Tanat, from the north to Llanfach, and then from the valley of the Wye into Cardiganshire. Another road from London to Aberystwyth passes through Ludlow and Bishop's Castle to Newtown, where it joins the road just described; from Bishop's Castle runs by Montgomery to Welsh Pool; and another runs from Newtown to Llanbrackmaer and Towyn.

**Divisions, Towns:** Montgomeryshire takes its name from the town and castle of Montgomery, founded by Baldwin, count of Flanders, and consecrated by William the Conqueror and William Rufus, and recaptured by John of the Wye by Roger de Montgomery, earl of Shrewsbury, who gave both to town and castle his own name. The Welsh call the town, from the name of its original founder, Tre Faldwyn, and the county Sir Tre Faldwyn. The county was formed in the reign of Henry VIII. It is divided into nine hundreds, as follows:

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Pop. in 1831</th>
</tr>
</thead>
<tbody>
<tr>
<td>Llanfach</td>
<td></td>
<td>6,377</td>
</tr>
<tr>
<td>Deeavell or Deavhil N.E.</td>
<td>2,417</td>
<td></td>
</tr>
<tr>
<td>Pool</td>
<td>N.E.</td>
<td>9,067</td>
</tr>
<tr>
<td>Caerw</td>
<td>E.</td>
<td>2,719</td>
</tr>
<tr>
<td>Mabrethaf Central &amp; N.W.</td>
<td>7,693</td>
<td></td>
</tr>
<tr>
<td>Machynlleth W.</td>
<td></td>
<td>7,693</td>
</tr>
<tr>
<td>Llanddloes</td>
<td>S.</td>
<td>12,129</td>
</tr>
<tr>
<td>Montgomery S.</td>
<td></td>
<td>5,532</td>
</tr>
<tr>
<td>Newtown</td>
<td>Central</td>
<td>13,930</td>
</tr>
</tbody>
</table>

It contains the borough and market towns of Montgomery and Machynlleth, at one or other of which the county court and court of election for the county members are held; Newtown and Welsh Pool, at which the assizes are now held in turn; Llanfach and Llanfyllin; and the market-town of Llanfach.
Montgomery is in the hundred of Montgomery, 168 miles from London by Ludlow, or 174 by Shrewsbury. Baldwin or Baldwin, who had been appointed lieutenant of the marches by William the Conqueror, built a castle or other military post here, and laid the foundations of the town (A.D. 1092). Both appear to have been almost immediately captured by the Welsh, from whom they were taken again (A.D. 1093) by Roger de Montgomery, earl of Arundel and Shrewsbury. The earl fortified the place and called it after himself "Montforth," but in 1221 it was taken by Hugh Welsh, who put the garrison to the sword, and ravaged this part of the border-land. William Rufus assembled an army, repulsed them, and strengthened and provisioned the castle of Montgomery. It was however again taken in 1221 by an utter descent of the Welsh; but the Normans' power prevailed, the Welsh were driven to their fastnesses, and the earl of Shrewsbury rebuilt the castle. This however appears to have shared the fate of its companion, the castle of Haynll, built on a new castle here, A.D. 1221, which was, ten years afterwards, taken and burned by Llewelyn, prince of North Wales. Montgomery afterwards formed part of the possessions of the Mortimer family. In the civil war of Charles I. the castle was fortified for the king, but in 1642 was taken by the parliamentarians, and was shortly afterwards besieged by the Royalists. The advance of a body of 3000 Parliamentary troops to its relief led to a desperate encounter, in which the Royalists (5000 strong) were defeated, with the loss of 500 slain, 2000 wounded, and 2000 prisoners. The castle of Montgomery afterwards dis mantled by the order of the House of Commons.

The town is partly on the slope and partly on the summit of a hill, which is commanded by a much loftier elevation in the immediate neighbourhood. It is a small place, consisting of about 500 houses, the great bulk of which are scattered in the centre of the town. The houses are well built and of respectable appearance, and the town is the residence of several persons of small independence, to whom its quiet situation and delightful situation, as well as economical living, are a blessing. It is not on any great thoroughfare, and has little trade or manufacture. There is a weekly market on Thursday, well supplied with corn and provisions of all kinds. There are several yearly fairs. The population of the parish in 1831 was 1186, about one-third agricultural.

The castle stood on a steep projecting eminence on the north side of the town. The remains consist of a fragment of a tower at the south-west angle and some portions of the wall. But the main remains of the castle are in the form of a hill above the town is a level space, probably used as a parade for the garrison. This castle appears to have been defended by four ditches cut in the solid rock, and crossed by drawbridges. The town itself was also defended by walls that flanked the towers and separated the fosse of these defences there appear to be no other remains than a few trifling fragments of the wall. At the foot of the castle-hill are traces of a small fort, conjectured to be the original Norman castle erected by Brevyn; and on a neighbourhood in the only accessible parts by deep ditches, are the remains of an extensive British camp, from which is a fine view of the vale of Montgomery. The church is an antique cruciform building, not very large, in the early English style, with a tower erected in the course of the present century. There are some interesting monuments in the church. The town-hall is a brick building, with a market-house underneath; and there is a new county gaol on the road to Shrewsbury. There is a meeting-house for the society of Friends.

Montgomery is a corporate town; the limits of the borough and parish are the same. The corporation consisted, at the time of the Municipal Commissioners' Reports, of 72 resident burgesses. There is no town-council; but two bodies of elected officials, the mayor and aldermen, were elected by the burgesses in common hall. The corporation remains unaltered by the Municipal Reform Act. The borough has returned one member to parliament from the time of Henry VIII. Llanfyllin, Llanfyllin, Machynlleth, and Welshpool were formerly contributory boroughs, but had been disenchanted for above a century before the Reform Act, by which they were restored, and Newtown added. The county-court and the election for the county member are held either at Montgomery or Machynlleth.

There were, in 1833, four day-schools, with 167 children, and two Sunday-schools, with 133 children. One of the day-schools, with 42 children, was partly supported by an endowment and by donations.

Machynlleth, or Machynlleth, is in the hundred of the same name, 208 miles from London by Bishop's Castle, Newtown, and Llandinews, or 215 miles by Shrewsbury and Welshpool. It has been commonly asserted to have been a Roman station, and some regard it as the Maglev of the Roman road from Watling Street to the Severn. It is now a pleasant town; of populous, of populous, in the neighbourhood of Machynlleth, but in an adjoining county. [MACHYNLETH.] It was at Machynlleth that Owen Glyndwr held a parliament or assent of the princes of Wales, A.D. 1402, by which his title to the principality was founded.

The parish is very extensive, and comprehends three townships, of which two, Uwch-Yr-Garreg and Is-y-Garreg, are entirely rural. There is a town hall in the north near the confluence of the Welsh and the English river, regularly built, and consist of two principal streets in the form of a T: the streets are wide and spacious. There is a town hall and market-house, a plain building; the ancient building, in which the parliament of Glyndwr assembled, is still standing. Newtown church, on an eminence, the church, rebuilt, with the exception of the tower, in the present century, is tolerably large. There are several dissenting places of worship, and there are national school-rooms.

The population, in 1831, was 2351, of which 1657 persons were in the town and 694 on the surrounding parishes, which are Uwch-Yr-Garreg and Is-y-Garreg townships, more than half was agricultural; of the population of the town liberty scarcely any. The chief manufacture of the town and neighbourhood is that of 'wobs,' or coarse woollen cloths and coarse flannel. The second manufacture is that of the manufactures and fulling-mills. The weaving is generally done at the weavers' own cottages; the goods are chiefly sent to the market at Welshpool.

A good deal of tanning is done. Slate is quarried in the district. There is a poor house in the parish, within two miles of the town, and affords facilities for the export of oak, bark and timber, and the import of corn, coals, clays, limestone, raw hides, and other articles.

The markets are on Wednesday and Saturday, and there are at least 100 in the year.

Machynlleth was formerly a parliamentary borough, contributory to Montgomery; and after being disfranchised above a century, was restored by the Reform Act: the parliamentary limits include the town liberty and a small portion of the adjacent parishes.

The living is a rectory, in the diocese and archdeaconry of St. Asaph, of the deanery of Welsh, value of 230s., with a glebe house.

There were, in 1833, in the town liberty, one day-school, with 38 children; one day and Sunday national school, with 126 children; and four Sunday-schools, with 655 scholars, 'men, women, and children, of all ages, who continue to attend during the whole of their lives.' The other two townships had two day-schools, with 41 children; and six Sunday-schools, with 486 scholars.

The county court is occasionally held, and the election of the county member occasionally takes place, at Machynlleth.

Newtown (in Welsh, Tre Newydd) is in the hundred of Newtown, 175 miles from London by Bishop's Castle. Little is known of the origin and early history of this place, and the increase of the flannel manufacture has brought it prominently into notice. It is in a delightful valley on the right or south bank of the Severn, over which there is a stone bridge of one arch, and on which, in the centre of the town, stands very inconveniently in the midst of the principal street. The church is an antique structure, of little architectural pretensions: the steeples low, and are surrounded by a wooden gallery. There are in it some marble monuments of the Pryse family, and a fine monument of a stone bridge, dividing the channel from the nave, said to have been brought together with the font, from the abbey of Cwm Hir, in Radnorshire. There are several places of worship for the different dissenting sects. On the north bank of the Severn, in the townships of Heddledy and Gwestydd, in the parish of Llanilwchfaen, a suburb has been formed, which
has received, and in all probability will receive, great additions.

By the Reform Act, Newtown was added as a contributory borough to Montgomery. The borough comprehends the parish of Newtown and the villages of Llandinam, Llanbadarn, and Llandyfryd. It is surrounded by the parishes of Montgomery, Merioneth, and Denbighshire, and its boundary line extends from the river Dyfi to the river Severn. It is a market town, and is celebrated for its agricultural gatherings.

The population of the parish of Newtown in 1831 was 4533, and in 1841 it was 4613. The population of Llandinam was about 2000, less than half agricultural: together 6555, of which about 5000 were resident immediately in the town or suburb. The staple manufacture of Newtown is that of flannel, which is of excellent quality: the manufacture is carried on chiefly in factories, and is conducted with skill. The quality of the water is also considered to conduct to the goodness of the fabric. There are several fulling-mills and bleaching-grounds. There are potteries, tin-yards, and malt-kilns and breweries, and there is a considerable trade in the manufacture of flannel.

The Montgomery Canal commences at this town; there is a large basin, and around this, or along the banks of the canal, are lime-kilns, and convenient wharfs and yards for landing and storing coals, bricks, slates, timber, and other articles of commerce. The Montgomery Canal, on Tuesday for corn and provisions, on Thursday for flannels (lately established), and on Saturday for provisions. There are several yearly fairs, one of them a considerable fair for sheep and pigs. Petty-sessions are held in the town; and, by the order of the justices for the county, the winter assizes are held here. It has been thought that the county gaol was formerly at Newtown: a public house, lately and perhaps still in existence, was called the Old Gaol.

The living is a reversion to the clergy of 406l., with a glebe-house: that of Llandinam is a vicarage, of the clear yearly value of 352l., with a glebe-house: both are in the archdeaconry and diocese of St. Asaph, and in the gift of the bishop.

There were in 1833, in Newtown and Llandinam, parishes, thirteen day-schools, with 355 children, and six Sunday-schools, with 1540 scholars.

Welsh Pool (so called to distinguish it from the town of Pool, in Dorsetshire) is locally in the hundred of Pool, 171 miles from London by Shrewsbury, or 176 by Ludlow. It was in the two ancient bishoprics of Bangor and Llandaff. Bishop's Castle, and Montgomery. The town derives its name from a deep pool or lake, called Llyn Du, near which it is situated: from the same circumstance of its situation, the town is called, in Welsh, Yr Llyn. Cadwgan, a powerful chieftain of the early British inhabitants, had a castle here a.d. 1109, but it was left unfinished at his death. It was completed by another; and in 1191 it was taken, after a long siege, by the English, who repaired and strengthened the walls. The house of Cadwgan, the family of the Powysland; and these having taken part with the English, the castle was taken from them (a.d. 1223), and dismantled by the prince of North Wales. This castle was afterwards restored, and received the name of Powys Castle, which it still retains. The castle was fortified in the civil war under Charles I. by Lord Powys, the owner of it, who embraced the king's party. It was obliged to surrender, a.d. 1644, to the parliamentary commander, Sir Thomas Middleton.

The town is near the left or west bank of the Severn, in a valley opening upon that river, and watered by two brooks which flow into the Severn. It consists of two parts, Pool Town and Welsh Town. The principal street runs east and west, and other streets branch from or intersect this at right angles. The main street is well paved; the houses are chiefly of brick, respectable, and built with a regularity not usual in Welsh towns; and from this circumstance, and from the predominance of the English language, Welsh Pool might be taken for an English town. The building is entirely with carved wood; the roofs are generally the same under a corn-market, is in the centre of the principal street. The church is spacious and handsome; it was rebuilt, with the exception of the chancel and the tower, in the latter half of the last century, and is one of the most interesting examples of the early Georgian style. It is situated on a steep slope, and some parts of the churchyard are higher than the church. There are several dissenting meeting-houses, and a handsome building for the national schools.

The population of the parish of Pool (which is extensive, and has a detached portion in the hundred of Cawssg) was, in 1831, 4533. The principal manufacture is that of flannel, but it is not carried on so extensively as at Newtown, Llanbadarn, and Llandyfryd. The place has been under for many years the chief mart for the flannels and webs of the counties of Montgomery and Merioneth; but within the last few years an attempt has been made to make Newtown the chief mart for flannels. There are several malt-kilns, and a stone-quarry in or near the town. For provisions is on Monday, that for flannels on alternate Thursday. The Montgomeryshire Canal passes close to the town, and the navigation of the Severn begins here. There are several large mansions in the immediate vicinity, and the spring assizes for the county. The winter assizes have been lately removed to Newtown.

Welsh Pool received at an early period a charter of incorporation from the lords of Powys; but the governing charter is of James I. By the Municipal Reform Act the corporation consists of four aldermen and twelve councillors.

The living is a rectory in the archdeaconry and diocese of St. Asaph, of the clear yearly value of 273l., with a glebe-house.

There were in the parish, in 1833, twelve day-schools, with 383 children; three evening schools, with 233 children; and three Sunday-schools, with 550 children. Two of the day-schools have a small endowment, for which some of the children are educated.

Powys Castle is a spacious well-wooded park, on the south side of the town. It stands on a rocky ridge or elevation, and is built of red-sandstone, whence its ancient name of Castell Coch, or Red Castle. The different parts of this castle are of various dates, and in varying and incongruous styles of architecture. The repairs lately carried on are under the direction of Sir Robert Smirke, who are said to ' accord with the original design of the ancient edifice,' have perhaps removed these incongruities. The interior has a heavy and gloomy appearance; but it is adorned with portraits and other paintings, some of them by the best masters, statues, vases, and other antiquities. The gardens are (unless lately altered) laid out in the old style, with terraces, clipped shrubs, and the remains of waterworks.

Powys Castle, belonging to the family of the Clive Family.

Llandinam is in the hundred of Llandinam, 188 miles from London, through Bishop's Castle and Newtown. The town is in a pleasant vale watered by the Severn, on the south-east bank of which, 12 miles from its source, the town is built on a rise of land by a narrow valley. It is noted for its walks. Llandinam consists of two principal streets, crossing each other at right angles, and of some inferior ones. The houses were a few years since almost entirely built with timber frames and the intervals filled up by slates and plaster or mud; many were roofed with slabs of oak timber, cut into the form of slates; the streets, which are wide, were also disfigured by ashes or other refuse heaped up in front of the houses. But of late years great improvements have been made; many of the houses have been erected in the room of older structures, and the street nuisances have been cleared away. There are two bridges over the Severn, one of them is a handsome stone bridge of three arches. The market or town-house is in the middle of the town: it is modern, of brick, with timber and the intervals filled up by plaster and plaster or mud. The church consists of a nave and aisle separated from each other by curious clustered pillars, the capitals of which are decorated with palm-leaves. The roof of the nave is adorned with carved woodwork, and of the main door, with skilfully carved armorial bearings. The columns and the carved work of the roof are said to have been brought from Cwm Hir Abbey in Radnorshire. There are several dissenting meeting-houses.

The parish is very extensive, including large tracts of waste land on the slope of Peninmon. The population in 1831 was 4189, of which population 2562 persons were in the township of Llandinam. The staple manufacture of
the place is flannel. There are several factories for carding and spinning the wool, and fulling-mills. The wooving is done on the Saturday, the 'woolers' day.' The flannel made here is perhaps not so fine as that of Newport, but more durable. There are, in and round the town, several malt-houses or kilns, flour-mills, and tan-yards. Coarse slate and building-stone are quarried in the surrounding hills. There is a market on Saturday for wool, corn, and provisions; and several fairs in the year, some of which are great sheep-fairs.

Llandilo is a corporate town, but the corporation is not noticed in the Municipal Reform Act, or in the Corporations Act. It is a parliamentary borough, but not a county-borough, and is thus a contributory borough to Montgomery, and, like Machynlleth, Llandyfli, and Welshpool, was restored by the Reform Act, after a disestablishment of a century. The boundary of the parliamentary borough is much more comprehensive than that of the old borough. The number of qualified (i.e. 10l.) houses within the boundary was estimated by the Boundary Commissioners at 124.

The living of Llandilo is a vicarage in the peculiar jurisdiction of the bishop of Bangor; its clear yearly value is 153l., with a glebe-house.

There were in the parish in 1833 five day-schools (one partly supported by subscription), with 204 scholars, and seventeen Sunday-schools, with 264 scholars. The following observations are made on the schools, as exhibiting the nature of Welsh dissenting Sunday-schools. They are a kind of mixed congregation of all ages, parents with their children, heads of families with their servants. The number of children, under 14 years of age, taught at the schools in 1834, amounted (apart from the whole number returned) to 1736, or about one-fifth of the whole number returned; the rest being engaged in reading, repeating portions of scripture, or catechisms from memory, intermixed with praying and singing, making them upon the whole, as the author of the Regulations has remarked, 'the most useful schools in the country.'

Llandyfli, or Llanllyfi, is in the hundred of Llanfyllin, 179 miles from London, by Shrewsbury and Llandrinio Bridge, or 180 miles by Shrewsbury and Montford Bridge; in a pleasant valley watered by the Cain, an affluent of the Ys, a small stream and the soil very small. The principal street runs east and west, and is crossed by the Abel brook, which flows into the Cain; over this brook is a neat bridge. There is a town-hall, a neat brick building with a covered area for a market underneath, on one side of the principal street. The church is a brick building erected early in the last century.

The population of the parish (which is of considerable extent) was, in 1831, 1836; of whom 886 were in the town. There is little business carried on; a small quantity of lead is smelted, and sent to Montgomery and Shrewsbury.

The market is on Thursday, and there are several fairs.

Llandyfli was incorporated by Llewelyn ap Gryfydd, a Welsh chieftain in the time of Edward II.; two buliffs are elected by the inhabitants, as lord of the manor (i.e. of the burgesses), who are justices of the peace for the borough. The parliamentary franchise, which had been lost for a century, was restored by the Reform Act, and the limits of the borough considerably enlarged. Llandyfli is contributory to Montgomery. It was estimated by the commissioners to contain about 60 qualifying or 10l. houses.

The living is a rectory in the archdeaconry and diocese of St. Asaph, of the clear yearly value of 484l., with a glebe-house. There were in 1833 in the parish two-day schools with 43 children in 3 days, and Sunday schools with 181 children in the week days, and a smaller number on Sundays; and five Sunday schools, with 150 scholars. The national schools are partly supported by endowment.

Llanfair Bev, or Llanfair Caerinion, is in the hundred of Mathrafal and near the centre of the county, 183 miles from London through Bishop's Castle, Montgomery, and Welshpool. The town is on a rising ground on the south bank of the Vyrwy. It is nearly built and of pleasing appearance; the houses intersect each other, north and right angles. There is a plain but neat and commodious town-hall, with a market-house underneath. The church is an ancient building, capable of accommodating 500 persons. There are several dissenting places of worship, and a large agricultural. The principal manufacture is that of flannel, but it is carried on only to a very small extent. There is a market on Saturday, and there are several yearly fairs.

The living of Llanfair is a vicarage, in the archdeaconry and diocese of St. Asaph, of the clear yearly value of 328l., with a glebe-house.

There were in 1833, in the parish, one infant or dame-school, with 46 children; four day-schools, with 112 children; and four Sunday-schools, with about 300 scholars.

There are traces of a Roman road about two miles south of the town, and some Roman antiquities have been dug up in the neighborhood.

Llanbrynmair is a village in Machynlleth hundred, on the road between Llanfair and Machynlleth. The parish, which is of considerable extent, abounds with delightful scenery. It had, in 1831, a population of 246. A considerable quantity of coal is manufactured here, and the manufacture employs about 500 men in weaving, besides those occupied in carding and spinning wool. Peat is dug in the parish. The church is an ancient structure, adorned with some fine specimens of carved oak. There are some fine yew-trees in the churchyard.

The living is a vicarage, of the clear yearly value of 330l., with a glebe-house; part of the revenue is appropriated to a sinecure rectory, the clear yearly revenue of which is 65l. The benefice is in the archdeaconry and diocese of St. Asaph.

There were in the parish, in 1833, three day-schools, partly supported by endowment or gift, with 129 children, and nine Sunday-schools, with 1285 scholars.

Llanfair Caerleon, in Llanfyllin hundred, on the road from Llanfyllin to Bala, in Merionethshire: it is in a pleasant but narrow vale, watered by the Tanat, and surrounded by lofty and steep mountains. The parish, which is about seven miles long and as many broad, is the chief seat of the mine of lead which has been discovered; the mine was given by Mr. Bingley (Tour in Wales, A.D. 1798) as 'small and dirty.' There are many detached farm-houses in the valley. The church is a small ancient building, and there are two or three subscription-meeting-houses.

The population of the parish, in 1831, was 499: 16 men were employed in slate-quarries, and 20 in lead-mines. The principal lead-mine was discovered in A.D. 1692, and was worked so successfully as to yield for forty years a yearly profit of about 600l. A great deal of work was done in the 17th and 18th centuries, owing to the influx of water, the mine was drained and the working resumed. After a second discontinuance, it was again resumed, and is still carried on. The slate quarries are of tolerably good quality. Lead-mines appear to have been wrought in this vale in an early period.

The living is a rectory, in the archdeaconry and diocese of St. Asaph, of the clear yearly value of 126l., with a glebe-house. There were in the parish, in 1833, two Sunday schools with 192 scholars, and a small endowment for a day-school.

Divisions for Ecclesiastical and Legal Purposes.—The county is for the most part in the archdeaconry and diocese of St. Asaph. Those parishes in the hundreds of Cawre and Montgomery which are partly in the county, and those in the hundreds of Montgomery (except the parishes of Kerry and Moughtray, which are in the diocese of St. David's, and in the archdeaconries of St. David's and Brecon respectively), are in the archdeaconry of Silop and the diocese of Hereford. The hundred of Llandilo is in the peculiar jurisdiction of the bishop of Bangor. The number of parishes wholly or partly in the county is fifty-seven, but six belong chiefly to other counties. Of the remaining fifty-one, thirty-six are in the diocese of St. Asaph, six in that of Hereford, seven in that of St. David's, and two in that of Brecon. Of these, two rectories, eighteen vicars, ten perpetual curacies, and one chapelry, besides three sinecure rectories: making in all fifty-four benefices. Of these eleven are under 100l. annual value, fifteen under 500l., eleven under 1000l., two under 400l., two under 500l., and three under 600l. Of one no return has been made. The livings, with the exception of those in the diocese of Hereford, are mostly in the gift of their respective diocesan. All these dioceses are in the ecclesiastical province of Canterbury.

The county is included in the North Wales circuit. The assizes were, till lately, held at Welshpool; but, by order published in a late Gazette, they are to be held in the spring at Welshpool, and in the winter at Bala. The county court and house of correction are at Welshpool, and the quarter-sessions are held at Montgomery.
Montgomery or Machynlleth; and the polling-stations are Montgomery, Machynlleth, Llanidloes, Llanfyllin, and Llanfair. The contributory boroughs to Montgomery were Mervyn, Machynlleth, and Welshpool. It was some time before the franchise was extended to the persons of a committee of the House of Commons, A.D. 1728, and the elective franchise was monopolised by the burgesses of Montgomery alone, until the former contributory boroughs were restored, and Newtown added as another contributory borough. All these boroughs, except Montgomery, were enlarged by the Boundary Act.

History and Antiquities.—Montgomeryshire was, with the neighbouring counties, included, during the period of British independence, in the territory of the Ordovices, and continued to be a part of the Roman province under the name of Britannia. In the province of Britannia Secunda. It contains several memorials of Roman domination. The station Mediolanum, mentioned by Antoninus and Richard of Cirencester, is thought by the best antiquaries to have been in this county, though its exact site is not ascertained. It is supposed by some to have been on the bank of the Tanad (a site which will accord with its position in Richard's 'Itinerary'), between Henri Mons (Tommnen-y-Môr, near Bala) and Ruansianum (Rowton, near Shrewsbury); other authorities propose on plausible grounds to fix it at Myford on the Vyrnwy. It is supposed that there was a station at Cefyn Caer [Merionethshire], near Machynlleth. Some writers will have this to be the Maglupe of the 'Notitia,' but there is no substantial evidence to support this view. The remains of the 'Notitia,' that this can be regarded as merely a conjecture. Various Roman antiquities have been found near Machynlleth. The site of a Roman camp is traceable at Caer-Sws, about five miles west of Newtown; it appears to have been quadrangular, and 360 feet in diameter, and 300 broad. Several Roman bracks were dug up in one angle of this camp, and employed in building a chimney in the neighbourhood. There are other marks of intrenchments near it, and traces of a Roman road called 'Sarn Swanan.' A Roman fortess is said to have stood at Castell Caer Emion, about four miles from Llanfair, but there are no now traces of it.

After the withdrawal of the Romans we hear nothing of this county for many years. It was the scene of hostility between the British and the Mercians under Offa. The celebrated 'dyke' made by the latter traverses the county from north to south, passing a little to the east of Welshpool and Montgomery, and including the eastern part of the county in the Saxon territory. The rest of the county was included in Powys or Powysland, a designation which had previously been given to this part of Wales. In the latter part of the ninth century Powys became a separate principality, under chieftains who had their residence at Mathrafal, near the banks of the Vyrnwy above Myford. The persons of Powys were engaged in frequent hostilities with the Mercian Saxons along the border. There are some earthworks and other traces of the castle of the princes of Powys at Mathrafal.

In the year 894, in the reign of Alfred, the Danes entered the county. Hastings, or Hasston, or Hasston, their leader, had invaded the eastern parts of England; and in his third campaign, A.D. 894 or 895, he entrenched himself at Buttington, on the east bank of the Severn, close to Welshpool. There he was besieged by Alfred's thanes, until he surrendered to the Danes, and with fearful loss returned to his former quarters on the banks of the Thames.

After the Conquest, Powys became the continual object of attack by the Norman lords of the marches or frontiers. These hostilities led to the erection of the castles of Montgomery by the Normans, and Powys, near Welshpool, by the Normans and Welsh, and continued and severe struggles for the possession of these strongholds. The division of Powysland between two chieftains served to weaken the Welsh power, and to augment the predominance of the Norman barons.

In the latter part of the eleventh century a desperate engagement was fought on the hills of Carno, near the Afon Garro, between the forces of Gruffydd ap Cynan, lawful claimant of the throne of Gwynedd, or North Wales, assisted by Rhys ap Tewdwr, prince of South Wales, against those of Trahaire ap Caradog, his usurping competitor. The engagement was the most bloody of any recorded in the Welsh annals, and ended in the death of Trahaire and the entire defeat of his army.

The independence of Powys was overthrown before the final subjugation of North Wales: it became an English lordship, which remained for many years in the possession of the family of John de Charlton, who, in the time of Edward II., married the heiress of the Welsh chieftains. The barony and title passed to the family of the Percies, who became extinct in the reign of Henry VIII. The only remaining castles, or ruins of castles, appear to be those of Montgomery and Powys. There do not appear to be any material ruins in the county; none, at any rate, of importance.

In the civil wars of Charles I. Montgomery and Powys castles were the objects of contest. The incidents of the war are noticed above, in the account of the towns of Montgomery and Welshpool.

(Pennant's and Bingley's Tours in Wales: Beauties of England and Wales; Arrochar's Map of England and Wales; Groenow's Geological Map: Reports of Boundary and Municipal Corporation Commissioners, and other Parliamentary Papers.)

STATISTICS.

Population.—Montgomeryshire is mostly an agricultural county. Of 16,723 males twenty years of age and upwards, 4,925 are engaged in agricultural pursuits, and 1,639 in manufactures or in making manufacturing machinery. This latter number is chiefly employed in weaving, an occupation followed in this county more than in any other county of Wales. At Llanidloes 232 men are so employed, and in making machinery for that purpose and in other branches of the woollen manufacture. There are 549 woollen weavers at Newtown, 189 at Llanuwchafarn, 189 at Llanbrymarn, at Welshpool 65, indeed scarcely any parish throughout the county is deficient in this species of manufacture.

The following table contains a summary of the population, &c., of every hundred, as taken in 1831:

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cawres (hundred)</td>
<td>491</td>
<td>846</td>
<td>2</td>
<td>12</td>
<td>358</td>
<td>76</td>
<td>54</td>
<td>1,330</td>
<td>1,330</td>
<td>2,671</td>
<td>1,106</td>
<td>1,565</td>
<td>1,102</td>
</tr>
<tr>
<td>Deynnon</td>
<td>451</td>
<td>486</td>
<td>2</td>
<td>12</td>
<td>358</td>
<td>76</td>
<td>54</td>
<td>1,330</td>
<td>1,330</td>
<td>2,671</td>
<td>1,106</td>
<td>1,565</td>
<td>1,102</td>
</tr>
<tr>
<td>Llanidloes</td>
<td>1235</td>
<td>1336</td>
<td>6</td>
<td>61</td>
<td>726</td>
<td>313</td>
<td>297</td>
<td>3,496</td>
<td>3,333</td>
<td>6,829</td>
<td>3,323</td>
<td>3,506</td>
<td>3,323</td>
</tr>
<tr>
<td>Machynlleth</td>
<td>2178</td>
<td>2339</td>
<td>17</td>
<td>49</td>
<td>1090</td>
<td>807</td>
<td>441</td>
<td>5,923</td>
<td>5,236</td>
<td>11,159</td>
<td>5,236</td>
<td>5,923</td>
<td>5,236</td>
</tr>
<tr>
<td>Mathrafal</td>
<td>1517</td>
<td>1613</td>
<td>7</td>
<td>94</td>
<td>720</td>
<td>468</td>
<td>425</td>
<td>3,881</td>
<td>4,046</td>
<td>8,047</td>
<td>4,046</td>
<td>3,881</td>
<td>4,046</td>
</tr>
<tr>
<td>Pool (hundred)</td>
<td>574</td>
<td>1009</td>
<td>1</td>
<td>26</td>
<td>692</td>
<td>293</td>
<td>260</td>
<td>2,883</td>
<td>2,649</td>
<td>5,532</td>
<td>2,649</td>
<td>2,883</td>
<td>2,649</td>
</tr>
<tr>
<td>Pool (town)</td>
<td>2496</td>
<td>2931</td>
<td>9</td>
<td>96</td>
<td>1233</td>
<td>1231</td>
<td>456</td>
<td>6,930</td>
<td>7,000</td>
<td>13,930</td>
<td>7,000</td>
<td>6,930</td>
<td>7,000</td>
</tr>
<tr>
<td>Total</td>
<td>12,169</td>
<td>13,407</td>
<td>62</td>
<td>402</td>
<td>6510</td>
<td>4199</td>
<td>2599</td>
<td>33,048</td>
<td>33,426</td>
<td>66,482</td>
<td>33,426</td>
<td>33,048</td>
<td>33,048</td>
</tr>
</tbody>
</table>
The population of Montgomeryshire, as given at each time the census was taken, was as under:—

<table>
<thead>
<tr>
<th>Year</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
<th>Increase per cent.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1801</td>
<td></td>
<td></td>
<td>47,578</td>
<td></td>
</tr>
<tr>
<td>1811</td>
<td>51,931</td>
<td></td>
<td>8,353</td>
<td></td>
</tr>
<tr>
<td>1821</td>
<td>50,156</td>
<td></td>
<td>5,000</td>
<td>10%</td>
</tr>
<tr>
<td>1831</td>
<td>59,899</td>
<td></td>
<td>10,743</td>
<td>21%</td>
</tr>
</tbody>
</table>

showing an increase between the first and last periods, of 18,304, or nearly 39 per cent. on the whole population; being 19 per cent. less than the whole rate of increase throughout England.

County Expenses, Crime, &c.—The sums expended for the relief of the poor at the three dates of—

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1811</td>
<td>£2,235</td>
</tr>
<tr>
<td>1821</td>
<td>£2,273</td>
</tr>
<tr>
<td>1831</td>
<td>£2,415</td>
</tr>
</tbody>
</table>

The sum expended for the same purpose for the year ending March, 1833, was £2,235; and assuming the population had increased at the same rate of progression as in the ten preceding years, the above sum gives an average of £2,241 for each inhabitant. These averages are above those for the whole of England and Wales.

The sum raised in this county for poor-rate, county-rate, and other local purposes, in the year ending the 25th of March, 1833, was £37,976 11s., and was levied upon the various descriptions of property as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>On land</td>
<td>£39,680</td>
</tr>
<tr>
<td>Dwelling-houses</td>
<td>3,174</td>
</tr>
<tr>
<td>Mills, factories, &amp;c.</td>
<td>721</td>
</tr>
<tr>
<td>Manorial profits, navigation, &amp;c.</td>
<td>197</td>
</tr>
</tbody>
</table>

The sum paid for the poor was £33,346 8s.

The total number of committals in each of the same years was 6, 7, and 34 respectively.

The number of persons convicted was 9 in 1831, 9 in 1832, and 4 in 1833.

For the poor:

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1834</td>
<td>£2,301</td>
</tr>
<tr>
<td>1835</td>
<td>3,949</td>
</tr>
<tr>
<td>1836</td>
<td>2,443</td>
</tr>
<tr>
<td>1837</td>
<td>2,525</td>
</tr>
</tbody>
</table>

For payments to the county rate:

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1834</td>
<td>£2,131</td>
</tr>
<tr>
<td>1835</td>
<td>835</td>
</tr>
<tr>
<td>1836</td>
<td>763</td>
</tr>
<tr>
<td>1837</td>
<td>293</td>
</tr>
</tbody>
</table>

For all purposes:

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1834</td>
<td>£3,386</td>
</tr>
<tr>
<td>1835</td>
<td>2,782</td>
</tr>
<tr>
<td>1836</td>
<td>1,480</td>
</tr>
</tbody>
</table>

The saving effected on the whole sum expended in 1834, as compared with 1833, was therefore 12,650 7s. 6d., or about 60 per cent.; and the saving effected on the sum expended for the relief of the poor was 11,661 4s. 1d. or 33 per cent. as compared with the expenditure in 1834.

The number of turnpike trusts in Montgomeryshire, as ascertained in 1833, under the acts 3rd and 4th Wm. IV., chap. 80, was 5; the number of miles of road under their charge was 490. The annual income arising from tolls and parish composition in lieu of statute duty, in 1835, was £1,297 16s., and the annual expenditure in the same year was as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual labour</td>
<td>4,459</td>
</tr>
<tr>
<td>Tea labour and carriage of materials</td>
<td>166</td>
</tr>
<tr>
<td>Materials for surface repairs</td>
<td>234</td>
</tr>
<tr>
<td>Land purchased</td>
<td>53</td>
</tr>
<tr>
<td>Damages done in obtaining materials</td>
<td>9</td>
</tr>
<tr>
<td>Tradesmen's bills</td>
<td>101</td>
</tr>
<tr>
<td>Salaries of treasurer, clerk, and surveyor</td>
<td>949</td>
</tr>
<tr>
<td>Law charges</td>
<td>1,325</td>
</tr>
<tr>
<td>Interest of debt</td>
<td>2,333</td>
</tr>
<tr>
<td>Improvements</td>
<td>6,160</td>
</tr>
<tr>
<td>Debts paid off</td>
<td>150</td>
</tr>
<tr>
<td>Incidental expenses</td>
<td>418</td>
</tr>
<tr>
<td>Estimated value of statute duty performed</td>
<td>2,337</td>
</tr>
</tbody>
</table>

The various sums placed in the savings' banks in 1834, 1837, 1838, were distributed as under:

<table>
<thead>
<tr>
<th>Year</th>
<th>Deposits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1834</td>
<td>£1,200</td>
</tr>
<tr>
<td>1835</td>
<td>1,203</td>
</tr>
<tr>
<td>1836</td>
<td>1,201</td>
</tr>
</tbody>
</table>

The number of persons qualified to vote for county members in Montgomeryshire is 2915. Of these 139 are freeholders, 203 leaseholders, and 1077 occupying tenants. The number of voters is about 24 in the whole population, and one in 6 to the male population twenty years and upwards, as taken at the census of 1831.

The following summary is taken from the Educational Returns laid before parliament in the session of 1835: the inquiry was made in 1835.
Infant schools 6
Number of children at such schools; ages from 2 to 7 years:
Males 7
Females 33
Sex not specified 59

Daily schools 120
Number of children at such schools; ages from 4 to 14 years:
Males 1,837
Females 1,426
Sex not specified 1,366

Total of children under daily instruction 4,658
Sunday-schools 192
Number of children and others at such schools; ages from 4 to 70 years:
Males 4,632
Females 4,393
Sex not specified 7,433

Assuming that the population had increased between 1831 and 1833 in the same ratio as in the ten preceding years, and that the children between the ages of 2 and 15 years bore the same proportion to the whole population as in 1821, then we obtain 22,604 as the approximate number of children between those ages living in Montgomeryshire in 1833. Fourteen Sunday-schools are returned from places where no other school exists, and the persons who attend from 114 (in number) cannot be supposed to attend any other school; at all other places Sunday-school children have opportunity of resorting to other schools also, but in what number, or in what proportion duplicate entry of the same children is thus produced, must remain uncertain. Thirteen schools, containing 866 children, which are both daily and Sunday schools, are returned from various places, and duplicate entry is therefore known to have been thus far created. Some of the Sunday-schools consist of adults and aged persons as well as children. Making allowance for these causes two causes for inaccuracy, we may perhaps fairly conclude that not more than three-fourths of the whole number of children between the ages of 2 and 15 are receiving instruction in Montgomeryshire.

Maintenance of Schools.

<table>
<thead>
<tr>
<th>Description of Schools</th>
<th>By endowments</th>
<th>By subscription</th>
<th>By pensions</th>
<th>Subsidy and other public grants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total 26 1389 191 16,649 88 2536 13 660</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The schools established by dissenters, included in the above statement, are—

Scholars.

Daily schools 7, containing 221
Sunday-schools 143 12,774

The schools established since 1818 are—

Infant and other daily schools 61, containing 2,464
Sunday-schools 161 14,305

No school in this county appears to be confined to members of the Established Church or of any other religious denomination, such exclusion being disclaimed in almost every instance, especially in schools established by dissenters, with whom are here included Wesleyan Methodists. Lending libraries of books are attached to 4 schools in Montgomeryshire.

MONT. (Moor: Year.)

MONTI, VINCENZO, born in 1753, near Ferrara, in the Papal State, studied at Ferrara under the poet Minzoni, and gave early indications of poetical genius, as well as of correct taste in refusing to join the effeminate race of sonneteers and courtly versifiers, and resorting to the good old racy style of Dante for his model. From Ferrara Monti repaired to Rome, the capital of his native country, and the general resort of aspiring unprovided provincials who looked for patronage and support. In that metropolis he was fortunate enough to be introduced to Don Luigi Braschi, the favourite nephew of the then reigning Pope Pius VI, and was retained by that nobleman as his secretary, an office well suited to the habits and disposition of the young poet. He assumed the convenient costume of an Abbé, which at Rome was a general passport into society, and did not bind the wearer to any clerical duties or vows. Monti was now in a fair way to be the poet he wrote sonorous verses for the fair and sacred elegies for the church unnoticed by prelates and cardinals, was admitted into the Academy of the Arcadians, and had disputes with several members of that pedantic assembly. He was abused and slandered because he took no notice to conceal his temper or his versifiers. He bore the annoyance for so many time, but at last his spirit, naturally intolerant, rose under the persecution of medicoire, and he repaid his adversaries with interest in a 'Sonetto cilla Coda,' or 'sonnet with a tail,' a satirical composition addressed to father Quirinus, in which he draws, in a few angry satirical strokes, a sketch of his enemies, using theplainest vituperatives, and a phraseology compared with which Byron's 'English Barda and Scotch Reviewers' might be called a model of urbanity. Alderi's dramas were at that time the subject of general laughter in Italy. With all their faults, they bore the stamp of a superior mind, and Monti readily acknowledged the powers of the writer, but he disapproved of the shrivelling and stiffness of his diction, and reproved him for the vulgarities of his verse. Monti thought, and with reason, that the language of Italy was fully capable of expressing energy without harshness, and in order to demonstrate this he composed in 1766 his tragedy of 'Aristodemo,' which was received with great approbation, and established the reputation of his school. 'Aristodemo' is a strictly classical drama, and is a fine specimen of that species of composition The subject, taken from Sannazza, is the voluntary death of the king of Messene, after having concluded peace with Sparta. Prompt for another attempt, this secret crime, the murder of his own daughter, committed by Aristodemus in his younger years, through the force of disappointed ambition, and a gloomy belief in the unavoidable destroys of fate, are the leading features of the character of the king, which is delineated with fearful and solitary grandeur. Touches of softer feeling appear here and there like wild flowers amid a barren desert, and serve to relieve the deep shade of terror which pervades the whole drama.

Monti dedicated his drama to the Duchess Braschi, his patron's consort, who was then the reigning beauty of Roman fashionable society, and to whom he addressed also other minor compositions, among which is his beautiful allegory of 'Amor Pellegrino.'

When Pius VI, proceeded to Vienna to remonstrate with Joseph II. on his ecclesiastical reforms, Monti wrote a poem on the subject of that journey, entitled 'Il Pellegrino Apostolico,' which, like all Monti's works, contains great beauties of execution.

The tragic death of Hugo de Basaville, the agent of the French republic, who while endeavouring to excite a revolution at Rome was murdered in the streets by the populace, in January, 1793, suggested to Monti the idea of a poem in three books, which he entitled the 'Basavillana.' The poet represents the soul of Basaville issuing out of its bleeding body, when a tutelary angel comforts the trembling spirit with the assurance that its aims are remitted, but that eternal justice has decreed that it shall wander over the earth and witness the horrors which are about to be inflicted in France till the measure of God's wrath shall be full, and that country shall have expelled its crimes. The soul of Basaville takes an affecting leave of its earthly frame, the companion of its mortal career.

Parole parle, olimigne al coeur effroy, Già son consolo in vita, a qui le venne Vastà di vedere un fiume e de' li regni Dormi in pace, dicono, o mio pone Caro compagno, inda che del gran dis Udi il tuo nome a rizzare la vita Lieve intanto la terra, ed oilet e pig Beve il tuo bere il pianto e di non dite Parole il messaggio scolto in ria.

The spirit takes its flight towards France, and the poem, which is an imitation of Dante's 'Comedia,' consists of descriptions of its passage which are graphic and vivid. The execution of Louis XVI, interspersed with dialogues with the souls of other victims of the Revolution, is noted, and some of the descriptions are truly magnificent, such as that of...
the gigantic cherub watching over the Vatican, the account of the horrors of Marseilles, the description of Paris under the reign of terror, and the tragedy of the 21st of January, when the poet introduces the shades of former regicides and of infulled writers exulting at the execution of Louis, and the phantoms of the ancient Deiuds rejoicing in the sight of bloody holocausts rendered. Amidst the strange but striking conceptions of the poet, we may notice one in canto iv., where the angel tells Basvillai that the souls of several revolutionists and members of the Convention have been sentenced to eternal torments before their natural death, and that demons have possession of their bodies, so that these satanic incarnations breathe and act, sit in the Convention, and write and speak under the inspiration of the intrusive spirit, but in appearance as if the bodies were still animated by their former possessors. The poem, which was left unfinished, ends with cantos iv., when war is proclaimed in heaven, and echoed throughout Europe, against France.

The 'Basvillai' had an astonishing success: eighteen editions of it appeared in the course of six months. Fantastical as the conception may appear, it is still considered as Monti's best work.

When the French armies invaded North Italy and occupied Ferrara, the country of Monti, the poet left Rome and repaired to Milan, the capital of the new Cisalpine republic. Here he composed a song celebrating the Cisalpine republics and revolutions: among others he composed a savage song for the theatre of La Scala on the occasion of the festival of the 21st of January, 1799, the anniversary of the day of the execution of Louis XVI., an act which he had declared, in a famous speech, to be that of a 'Basvillai.' About the same time he wrote his famous sonnet against England, beginning 'Luce ti neghi il sol, erba la terra,' and in which, after a shower of invectives and oaths, he forecasts a day when, stripped of all her ill-gotten wealth, Britain will be forced to the primitive occupation of fishing to support herself.

At the epoch of Swarraro's invasion of Italy in 1799, Monti, with many others, took refuge in France, from whence he returned after the battle of Marengo. On his return he wrote a beautiful song in praise of his native country, which was sung to music and became very popular.

His second political poem, which he styled a 'Cento,' on the death of his friend and confrere, a man of science and letters, who had died in France, in exile, in 1799.

It is a vision, like the 'Basvillai,' but the sentiments are more placid and humane. There is the same difference between the two as there is between the 'Inferno' and the 'Purgatorio'; while in the latter the honours of the 'Basvillai,' we feel more at ease, our sympathies are better engaged, in reading the 'Mascheroniana.' Monti introduces the poet Parini, who died after the invasion of Italy by the Austro-Russians, relating to Maschera-

Monti's 'Proposta' is valuable, not only as a supplement to the Italian Dictionary, but as a store of erudition: it contains original disquisitions of essays upon questions connected with philology and literature.

Monti was a classicist, and, as such, waged war against the 'Romantici,' as they are called, or that school of writers who have undertaken to modernise the literature of Italy. In one of Monti's latest essays, 'Sermone sulla Mitologia degli antichi' he gives a fine condensation of the school's creed concerning poetical composition. He excludes against the northern school,' that has 'decreed the death of all the gods of Olympus.' Monti pleads for mythology and classicism like an able advocate in a weak cause; but when he says that under the new or romantic school everything in nature becomes inanimate and unimpressive; that the sun is degraded to a mere huge immovable disk of fire; that the sea is nothing more than a deep excavation, filled with slumberous unconsciousness; that all cems are now turned into divined poetry,—he speaks as a prejudiced partisan; he forgets that there are beauties in nature older than and independent of the fictions of mythology; he forgets the magnificent poetry of the Old Testament; he forgets the poetry of Virgil, Dante, and Ariosto, to mention but his own Basvillai, the most splendid of his works; he forgets that even his favourite authors, Dante and Tasso, besides numerous others, have painted the sea, the firmament, and the fields of the earth in the most poetical colours, with such romantic resource to Phoebus and Thetis, to Dryas and Fauns.

Monti might be considered as the last of a list of writers who form the connecting link between the old and modern schools of Italian literature. He was the contemporary of Alerio, Parini, Pindemonte, Froscollato, and of Count Manston; and with his name will go down to posterity for his truly poetical genius, his feeling of beauty, and the fluency and harmony of his verse.

Monti died at Milan, in October, 1825. His works were
collected and published at Bologna, in 2 vols. 12mo., 1828 ; and another edition of his choice works, including some inedited ones, was published in 5 vols. 8vo., Milan, 1832.

MONTICAGLIA. Lamarec's name for a genus of Harlem fly, Haematopus.</p>

MONTOLLAVITIA. [MADROPHYLLA.] MONTMARTRE. [PARIS.] MONTMERY. [MUSIK.] MONTMIREY. [MAMM.] MONTMORY. [MAMM.] MONTMORENCY. [FRANCE.] One of the old and illustrious French family, so called from the little town of the same name situated a few miles north of St. Denis near Paris. The oldest of this family on record is Bouchard de Montmorency, who was born in 1590, and was a great feudal lord of his time. He married Hildegarde, daughter of Thibaud count of Chartres and Blois. His son Bouchard II. was one of the principal lords of the court of king Robert about the year 1000. Mathieu I., lord of Montmorency, was high constable of France under Louis the Young; he married Aline, a natural daughter of Henry I. of England, and died in 1660. His grandson Mathieu II. of Montmorency, was the friend of Louis VIII., and the chief support of his government, and of that of queen Elue, who was his cousin. Montmorency ranked as first baron of France, and was styled first baron of Christaindom. The family afterwards became divided into several branches, one of which, though much the oldest, obtained the ducal title from Henri II. of France, and became the Lords of Le.bel. The last of the line of dukes was Anne de Montmorency, marshal and high constable of France, who distinguished himself in the wars of Francis I. as a great successor to his successor Henri II., but after his death was captured at the battle of Pavia. Catherine de Guise, was recalled to court in 1556, fought against the Calvinists, was mortally wounded at the battle of St. Denis, in November, 1567, and died three days after, at his house in Paris, at seventy-four years of age. He was a brave but fearless general, and a man of probity and moderation. His natural talent and the experience of a long life, he was an able statesman and counsellor. His grandson Henri II., duke of Montmorency, marshal of France, fought with distinction under Louis XIII., but being dissatisfied with Richelieu, he retired from public life. Montmorency was naturalized in 1686, and became a French subject. MONTMORILLON. [VIERNE.] MONTPELLIER, a town in France, capital of the department of Hérault, on the river Lez, which flows into the Mediterranean, in 43° 36' N. lat. and 3° 52' E. long.; 368 miles in a direct line south by east of Paris; 436 miles by the road through Névers, Moulins, Clermont, Mende, and Anduze; or 483 miles through Sens. As their names, &c., were settled there; and also many wealthy men, who granted aid and protection to those who resorted to them. (Elzevir edit. A.D. 1633.)

The lordship of Montpellier was at this time in the hands of the kings, first of Aragon, and subsequently of Majorca, a younger branch of the same house. These princes held their lordship immediately of the bishops of Maguelone, who divided with them the jurisdiction of the city, under the suzerainty of the king of France. The portions of both the bishop and the king were alternately united to the French crown; the first in the reign of Philippe IV. le Bel (A.D. 1293), by purchase; the second in the reign of Philippe (de Valois) III. (1294-1314). The lordship was subsequently conferred on Charles le Maure, king of Navarre (A.D. 1271), in exchange for certain lordships ceded by him to the king of France; but on the forfeiture of that king's domains for treason (A.D. 1378), it was re-united to the French crown. In addition to the crown revenues and exactions of the duke of Anjou, the king's brother and lieutenant, was suppressed (A.D. 1379), and the city, after one brief alienation of fifteen months, was permanently united to the domains of the crown.

In A.D. 1528 the bishopric of Maguelone was transferred to Montpellier. Montpellier came into the hands of the Huguenots in the reign of Henri III., and they, having organized it as a municipal republic, retained possession of it until the crusading party of Richelieu, under Louis XIII., Montpellier, after a long and obstinate siege, surrendered to the king (A.D. 1622). Louis XIII. ordered the construction of a citadel to retain the place in subjection.

Montpellier is situated on an eminence, from which there is an extensive prospect over the Mediterranean and the adjacent coasts, extending on one side to Mont Ventoux, in Provence (not to the Alps, as some authorities state), and on the other to Le Canigou, one of the summits of the Pyrenees. It is only 16 miles by water. It is very picturesque, and even extreme points can be seen. Montpellier is surrounded by antient and now ruined walls of freestone. The citadel is of little strength; it is however well kept up, and has a very narrow and crooked, and steep, but the houses, which are almost all of stone, are substantially built, though not handsome, except in the newer parts. Most of the places or squares are small and of irregular form; the public fountains are numerous, but none of them are remarkable for propriety of design or excellence of workmanship. There are two promenades, the esplanade between the walls of the town and the ramparts of the citadel, and the Peyrou, a terrace planted with trees and covered with turf, and raised ten or twelve feet above another terrace, and terminating in a very extensive manner. The terrace are a bronze equestrian statue of Louis XIV., and an hexagonal tower adorned with columns, enclosing a reservoir supplied with water by a fine modern aqueduct. This reservoir from this reservoir falls in a cascade over artificial rocks, and is connected with the principal fountains of the city. The cathedral presents little that is worthy of notice, except a picture in the choir of the fall of Simon Magus, by Sebastian Bontorn, who was a native of Montpellier. The Peyrou is a large area of land, and now the Exchange, is adorned with a handsome Corinthian portico, and is perhaps the handsomest building in the city. The modern anatomical theatre is a fine building, and the gate of Peyrou, a triumphal arch opening on the promenade of Peyrou, is also handsomely built; but the other public buildings, as the former episcopal palace (now occupied as a medical school), the court-house, the prefect's house, &c., are of ordinary appearance.

The population of Montpellier, in 1831, was 33,914 for the town, or 35,925 for the whole commune; in 1836 it was 35,966 for the commune. These enumerations are, we believe, exclusive of the students and other strangers, who are attracted to Montpellier by its literary advantages, or by the high reputation of the city, enjoys for the beauty of its situation and the healthfulness of its air. The manufactures of the place are considerable, and trade is prosecuted on a large scale. There were, in 1816, eight banking-houses. Liqueurs, perfumery, preserves, dried fruits, vermouth vinegars, lavender and rose water, soaps, toilet and ammfortis, woolen cloth, muslins, coloured cottons, calicoes, table linen, cotton handkerchiefs, cotton counterpanes, blankets, hosiery of silk, cotton, or wool, hats, leather, corks, and paper, are manufactured; and these various articles, with the wool, wicker, brandy, oranges, citrons, and other fruits, and oil of the surrounding districts, furnish the chief articles of trade. The verdigris of Montpellier is in
particular repute; it is chiefly made by females. There are several printing-offices, sugar-houses, potteries, and oil-mills, a paper-mill, and a saw-mill. Cetso is the port of Montpellier, and there are ready communications with Narbonne, Carcassonne, Nimes, Avignon, and other cities of the south of France.

Montpellier is the seat of a bishopric, the diocese of which comprehends the department of Hérault; in the city of the archbishop, Montpellier, the Church of St. Baudille, a Cour Royale, the jurisdiction of which extends over the departments of Aude, Aveyron, Hérault, and Pyrénées Orientales, and an Académie Universitaire, whose circuit is coincident with the jurisdiction of the Cour Royale. Then there is the court of justice or, a court for commercial causes, a board of trade, and several fiscal and administrative government offices. Montpellier is the head-quarters of the ninth military division, which comprehends the departments of Ardèche, Gard, Lozère, Hérault, Tarascon, and Aveyron. There are barracks and some military offices, several prisons, a house of correction for eight departments, with suitable workshops, and a charitable institution for the benefit of the prisoners.

There are, besides, the cathedral, several Catholic churches, a Protestant church, and a Jews' synagogue, four hospitals, one of which is for foundlings, and another for the insane. These hospitals, as well as the house of correction, are remarkable for their excellent management. The municipal council is for administering the affairs of the city without interest. There are two Protestant Bible Societies, one of them for each sex.

Montpellier has a number of institutions for educational and scientific purposes. The principal are the faculties of science, and medicine connected with the Académie Universitaire; also a college or high school. The school of medicine of Montpellier, one of the most eminent in Europe, owes its establishment to the Moorish or Arab physicians driven out of Spain by the Christians (a.p. 1209), and founded by the lords of Montpellier. From its first establishment, it has been much resorted to. Several eminent physicians and surgeons have been born in this city, and others have here received their education: among the latter are Chirac and Pavia, the surgeons, and Theriaki, the botanist.

There is attached to this school a library and a museum of natural history, and a collection of anatomical models in wax. The chair of the professor of anatomy is a fine marble antique, brought from the ruins of the amphitheatre at Nimes. There are several schools of pharmacy and veterinary medicine, schools of engineering, drawing, architecture, practical geometry, and music; societies of the sciences and arts, of practical medicine, and of agriculture; a museum of paintings, containing some specimens by the first masters. There is a botanical garden, one of the four in France designed for naturalising foreign plants, and the first for that purpose established in France. It contains more than eight thousand plants, an orangery, and a hot-house for tropical vegetation. Camusdenes and the historian Daur were natives of Montpellier.

Montpellier offers many attractions to strangers; numerous cafes, excellent inns, public baths, and a theatre where the performances are constant; to which may be added the beauty of the situation. The air is purer and less scorching and stifling than at Marseille. Flies are less troublesome, and the keen blasts of the Mistral are less felt.

The area of Montpellier is an area of 780 square miles, and comprehends 116 communes. It is divided into 14 cantons or districts, each under a justice of the peace. The population, in 1831, was 120,051; in 1836 it was 123,536.

MONTREAL, one of the five districts into which the province of Lower Canada is politically divided. [CANADA.] It comprises nineteen out of the forty counties of the province, and its comparative importance will further appear from the fact, that, of 51,917 inhabitants returned in the provincial census of 1831, there were 26,560, or very nearly five-tenths, of the whole number of French origin. The number of inhabited houses that time was 4,532; the extent of cultivated acres, only a part of which was brought under profitable cultivation, is 44,771 square miles, upwards than the area of England. There has been no account of the population taken since 1831; but calculating from the number of births and deaths, and the amount of emigration during the next five years, it was estimated that the population of the district amounted, in 1836, to 325,173.

MONTREAL, an island in the river St. Lawrence, situated 580 miles from the mouth of that river, at the point of its confluence with the Ottawa. This island is of a circular form, about 20 miles in circumference, and 11 miles broad. Its surface is low and flat at the western side, where it is subject to frequent inundations; but the level rises gradually towards the east, till it forms a ridge, whereon the upper part of the city of Montreal is built, at the height of 200 feet above the water. This city is divided into sixteen districts between counties into which the district is divided, and is a seigniory, which was formerly vested in the seigniory of St. Sulpice at Paris, but is now held by a resident religious body under that name, which owns 22 miles of the public land of the city of Montreal. The population of the island, in 1831, was 43,773, including 27,297, the inhabitants of the city.

MONTREAL, the City, of second importance only to Quebec in the province of Lower Canada, is built on the south side of the island, in 45° 31' N. lat. and 73° 24' W. long. It was founded in 1640, under the name of Villemarie, on the site of an Indian village called Hochelaga, and soon came to be a place of some importance. It is now divided into nine parishes; the streets are wide and arcuately planned. The principal public buildings run either parallel with, or at right angles to it. A great proportion of the houses are large and of handsome elevation, built with a greyish stone; the roofs are all covered with sheet-iron or tin plates. The population is estimated at from 20,000 to 25,000 souls. The Notre Dame church, which is 200 feet long and 80 feet wide. In this street are the principal public buildings: among others the Hôtel-Dieu, occupying a frontage of 224 feet, with a depth of 468 feet, the seminary of St. Sulpice, the town hall, the Château Rolin, Notre Dame, and the English church, the Montreal General Hospital, the Hôpital Général des Sœurs Grises, and the new college, which are also worthy of notice.

Montreal is a place of great trade. In the year 1815 there were 1,750 ships and cleared from the port the following amounts of shipping:

- From to and from Great Britain 73,578,406 69,185,444
- From to and from other British colonies 23,292,317 3,457
- From to and from the United States of North America 2 898 22,289
- From to and from Foreign countries 891 2,487

- Total 98,293,891 21,901

The harbour is small, but while the river continues open, it is always secure. Ships drawing 15 feet water can lie close in, and discharge their cargoes close to the shore. The harbour was formerly difficult of approach, owing to the rapid of St. Mary about a mile below the city, which is so strong, that with light or contrary winds, it was not possible to stem, but this difficulty is now overcome by the employment of steam-tug vessels. Montreal was formerly the head-quarters of the North-West Company. [Fur Trade.]
ceremonial was the commencement. He soon joined the popular party however in opposing the canons and other arbitrary innovations of the court on the established religion of the country; and on the 15th November, 1637, when the celebrated Tables were made up, that is to say, when the popular cause, which was added to the table of the nobility, to the great dismay of the bishops, who, according to Guthrie, 'thought it time to prepare for a storm when he engaged.' He was indeed the most ardent and zealous of his party, displaying at times a courage which was ready to try the thickness of his shirt, and drawing a sword to repel every breach of his defence. Such was his behaviour on occasion of the king's proclamation approving of the 'Service Book.' On that occasion Montrose stood for some time beside Johnston, whose deed was procuring a protestation in name of the Tables, but at length, the latter came a mere neutral, while he got up upon the end of a puncheon, which made his friend the earl of Rothes say, 'James, you will never be at rest till you are fairly lifted up above your fellows;' a remark uttered in mere jest, but recorded with solemnity by Gordon of Strachlo, who adds that the pro- phecy was 'accomplished in earnest in that same place, and some even say that the same supporters of the scaffold on which it occurred were made use of at Montrose's execution.'

Montrose regained his seat in 1639, which was projected by the Tables, Montrose was also a leading actor; and in swearing and imposing it on individuals there was none more zealous than he. This course of action was due to the natural temper, continued for some time: till at length, conceiving the importance and military talents undervalued by the Covenanters when Argyle and Leslie were allowed to lead, the one in the senate, the other in the field, Montrose deter- mined to enter himself into a secret correspondence with Charles, but this being detected, the Covenanters threw him into prison, where he was when Charles made his second visit to Scot- land. This took place in the year 1641; and as the prin- cipal objects of the expedition were to obtain the king's interest, Charles made various concessions, and Mont- rose was set at liberty with his adherents in the beginning of the year 1642. From that time he retired to his own house in the country, living quietly till the spring of 1643, when the queen returning from Holland, he was sent for to wait on her majesty at Buckingham, and accompanied her to York. He embraced this opportunity to urge on the queen, as he had formerly done on the king, what he termed the dangerous condition to which the nation was reduced by the absence of the army. Accordingly, he took another opportunity of waiting on the king with his proposals on behalf of his majesty, by whom he was favourably received; and at length, in the month of April, 1644, he was created Marquess of Montrose, and constituted captain-general and commander-in-chief of all the forces to be raised in Scotland for the king's service under prince Rupert. The royal arms were for some time unsuccessful however, and the prince seems to have re- corded Montrose in no other light than that of a fearless and dangerous enemy. He exhibited great ability, and was indeed almost always of a desperate character, and no failure ever destroyed his confidence of ultimate success. His army was reinforced from all quarters, its attacks were predatory and violent, and the progress marked by rapidity and romantic. At Tippermuir, a wide field about 10 miles from Perth, where Montrose came in sight of the enemy, upwards of 6000 in number, drawn up in one long line, with horse at the flanks, the Covenanters' horse were put to flight, and the whole of the citadel and baggage of the vanquished fell into the hands of Montrose and his men; and the defeat of Tippemuir was but the beginning of a series of conquests, which laid 1 Scotland open to the victorious Montrose. The last of the series was the battle of Atholl, massacre of Kilsyth, fought in the month of August, 1645. On this occasion Montrose had the advantage of selecting his ground with deliberation, whereas the Covenanters, on the other hand, came up after a toilsome march, and were even ordered to remove from their first position in the very presence of the enemy. While the Covenanters were thus occupied, Montrose cast his eye upon a company of cuirassiers, and, pointing them out to his men as 'cowardly rascals cast in iron,' he threw off his coat and waistcoat, tucked up the sleeves of his shirt, and, drawing a sword, made straight for the cuirassiers, cried out, 'Let us fight the fellows in our shirts.' This example instantly copied by the enthusiastic and sanguinary troop, and, falling upon the enemy before they had taken up the places assigned them, the battle ensued with such a roar of slaughter as reached as far as 6000 of the Covenanters, if we are to believe the royalists, were cut down and slain. Montrose now carried such of his men as would accompany him to the borders, presuming on the continued success of his arms. He was however mistaken: at Philiphaugh, near Selkirk, he was surprised by General Leisly on the 13th September, 1646, and upon the panic-struck royalists was that day in- flicted a fearful retaliation for their previous enormities.两手的交锋，虽有此战胜，但并无成功，毫无成效，因为是多数的，他这进行的一切，不但无益于国家，无益于党，但无益于他自己，但无益于他自己，但无益于他自己。}

When on the Continent at this time he had the offer of the appointment of general of the Scots in France, lieutenant-general in the Spanish army, but declined the appointment, with an annual pension besides his pay, but he declined all appointments, saying he wished only to be of service to his own sovereign.

He remained abroad till the accession of King Charles II., when he received the commission for a new invasion of his native country. Accordingly, selecting the remote islands of Orkney for his rendezvous, he despatched thither a part of his troops, consisting of foreign auxiliaries, in the month of September, 1649; and in the month of March following, he himself arrived there. In their first encounter with the enemy however on the mainland, his forces were utterly routed; and after some time, himself was discovered on foot in the disguise of a Highland rustick. In this disguise he made his way to the house of Maitland of Marnoch, in whose sight he was delivered up to General Leisly, and then conducted towards Edinburgh in the same mean garb in which he was taken; but in Dundee a change of raiment was allowed him. His reception in the capital was that of a condemned traitor, sentences of death and forfeiture having been pronounced by the General Assembly and parliament so far back as the year 1644; and many barbarous indignities were heaped upon him. But throughout, his dignity remained undiminished, and now excited a sympathy which had never before been felt for him. He received sentence of death with the same firmness; and on Tuesday, the 21st May, 1650, the sentence was executed upon him: he was hanged on a gibbet 30 feet high, and his limbs, after being severed from his body, were affixed to the gates of the principal towns in the kingdom. 'Thus perished,' says Laing (Hist. of Scotland, b. 6), 'at the age of thirty-eight, the gallant marquis of Montrose, with the reputation of one of the first commandeurs whom the times had produced. He exulted in his military exploits, those talents were rather those of an active partisan than of a great commander, and were better fitted to excite and manage a desultory war than to direct the complicated operations of a regular army... His heroism was wild and extravagant; prone to vast and desperate enterprises, without consulting a necessity rather than a virtue, by prejudices rather than by regulated principles; and it was less conspicuous during his life than from the fortitude with which he sustained an ignominious death.' He retained his heroism and self-possession to the last. On the Restoration, King Charles II. reversed the sentence of forfeiture which had been passed by the parliament; and his scattered remains were collected and buried in...
MONTERRAT, one of the Lesser Antilles, is about 22 miles south-west from Antigua, and about the same distance north-west of Guadaloupe. The island is about 12 miles long from south-east to north-west, and about 7 miles broad.

Montserrat was discovered by Columbus, and received the name from him in consequence of its resemblance to a mountain of the same name near Barcelona, and as being descriptive of its appearance, that of a broken mountain. The first settlement was made on it in 1655, by the English under Thomas Digges. It was taken from the English in 1664 by the French, but was reconquered by the English at the peace of Breda, and has since continued in the possession of the English. The island is of volcanic origin; the mountains are in many places quite inaccessible, and separated from each other by almost perpendicular chasms, which, with the sides of the mountains, to their summits, are clothed with a luxurious vegetation, including both lofty trees and tropical shrubs. On the south-west side, in a dell formed by the junction of three conical hills, and at a height of 1000 feet from the level of the sea, is a soufrière, or boiling sulphurous spring.

The town of Plymouth is situated on the south-west side of the island, in 16° 42' N. lat. and 62° 19' W. long. It is small, but well built. The shipping lies off the town in an excellent roadstead. There is no harbour or bay on any part of the shore, and it is hazardous for ships to remain at the island during the hurricane months. A heavy surf beats constantly on the shore, and it requires some skill on the part of those who manage the boats to land them without danger to life or property. For carrying produce and goods to and from the ship, a peculiar kind of boat, called a Moses boat, is used.

The island is esteemed so healthy, that it has acquired the name of the Montpellier of the West. The average mortality of the troops stationed there is found to be far less than is experienced in any other of the West India stations.

The population in 1834 was as follows:

<table>
<thead>
<tr>
<th>Race</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whites</td>
<td>140</td>
<td>149</td>
<td>289</td>
</tr>
<tr>
<td>Free Blacks</td>
<td>412</td>
<td>563</td>
<td>974</td>
</tr>
<tr>
<td>Apprenticed negroes</td>
<td>2,857</td>
<td>3,155</td>
<td>5,992</td>
</tr>
<tr>
<td></td>
<td>3,379</td>
<td>3,866</td>
<td>7,245</td>
</tr>
</tbody>
</table>

Montserrat is a dependency of the island of Antigua, but has a separate legislature of its own, consisting of eight members of the House of Assembly, two of whom are returned by each of the four parishes into which the island is divided, and six members of council. The settlers are mostly Irish, or the descendants of Irishmen.

The island produced for exportation in 1836, 11,586 cwt. of sugar, 33,300 gallons of molasses, 17,930 gallons of rum, and 3,908 cwt. of indigo.

At the distance of about three leagues to the north-west, and between Montserrat and Nevis, is a high, round, barren, and uninhabited rock, to which the name of Redonda has been given; it may be seen at a distance of nine or ten leagues.

MONTUCLA, JEAN ETIENNE, was the son of a merchant at Lyon, in which city he was born, 5th September, 1725. At the age of sixteen he became an orphan, and his grandmother, who had been left guardian of his education, died about a month afterwards. From a boy of Lyons his attention was chiefly directed to the study of the antient classics, although a decided taste for philologous pursuits in general, as is to be a peculiarly retentive memory, enabled him to become acquainted with several of the modern languages, among which the Italian, English, Dutch, and German are mentioned as those with which he was more particularly conversant. At this college also, under Le Père Béraud, the subsequent tutor of Lalande, he came into contact with several of the celebrated libraries of that metropolis, and at the scientific societies of M. Jombert, he made the acquaintance of Diderot, D'Alembert, Cochin, Lalande, and others. To his intercourse with D'Alembert in particular, he probably owed much of his mathematical knowledge; and Lalande, if he did not suggest a history of the mathematical sciences, at least gave him considerable encouragement. When once he had been formed, in 1754 he published in 12mo., anonymously, the "History of the Researches for determining the Quadrature of the Circle," to which was appended an "Account of the Discoveries of the Comète de la Conques," presented to the Angle. A second edition of this work appeared in 1821 in 8vo., edited by Lacroix. The following year (1755) he was admitted a member of the Academy of Berlin; and in 1758 he published, in two volumes 4to., the first part of the "History of the Mathematical Sciences." After he began to be employed by the government; first, as intendant-secretary at Grenoble, where he became acquainted with the family of M. Romand, whose daughter he married in 1763; and then (1764), as secretary and astronomer royal to the expedition for the triangulation of the island of Martinique. In the following year, he obtained, through the instrumentality of his friend Cochin, the situation of "premier conserves des bâtiments," the duties of which he discharged assiduously for twenty-five years. To the above appointment was added the honorary one of two years' books. His leisure was devoted to the education of his family and to scientific pursuits, but the latter he is said to have conducted with extreme secrecy, lest he should be suspected of neglecting his official duties. In this way he edited, in 1777, the "Mathematical Recreations," in 4 vols. 8vo., and so carefully had he concealed his connection with the work, that a copy was forwarded to him, in his capacity of censor, for examination in case of approval. The work was derived from his situation under the government, though small. It was for the immediate wants of himself and family, but by the events of the Revolution he lost his situation, and was left little short of destitute.

In 1774 he was employed in forming an analysis of the treaties deposited in the archives of the foreign department, and about the same time he was nominated professor of mathematics to one of the central schools of Paris, but his health not permitting him to fill the appointment, a situation of "Jurès d'Instruction publique," which he retained until his death, according to the promise made to him. In 1798 he published a second edition of the first part of his "History of the Mathematicians," in which he introduced many improvements and augmentations. With the exception however of the profits, if any, which he may have derived from this work, his only reward for two years, from which he could provide for his family, was an insignificant situation in the office of the National Lottery. Upon the death of Sausasse, in 1799, the minister Neufchâtel conferred upon him a pension of 2400 francs, which he received during 21 months, up to the close of December, 1799. His modesty and benevolence were so less conspicuous than his erudition and the smallness of his fortune. When Lalande, deputed by the Academy, offered him some situation in that society, he declined the honor in the ground of incompetency.

Before his decease he had occupied himself with the second part of his History. The completion of the work was confided to Landois, who, with the assistance of several scientific individuals, among whom was Lacroix, published the remaining two volumes in 1802. The whole work is divided into five parts, and these are subdivided into books and chapters. Part I. contains the History of the Mathematicians up to the destruction of the Grecian empire. Part II. contains the history of the "Jurès d'Instruction publique," of the Arabians, Persians, Jews, Indians, Chinese, and other Orientals. Part III. contains the History of the Sciences among the Latin and the Western nations up to the commencement of the seventeenth century. These three parts are in 4to. 4th edition, and comprehending the History of the Sciences during the Seventeenth Century, is divided into nine books, namely: 1. Progress of Geometry, as treated after the manner of the Ancients; 2. Progress of Analytical Geometry; 3. Progress of Mechanics about the middle of the Seventeenth Century; 4. Progress of Optics about the middle of the Seventeenth Century; 5. Progress of Astronomy during the Seventeenth Century; 6. Rise and Progress of the Differential and Integral Calculus in the latter part of the Seventeenth Century; 7. Progress of Mechanics during the same period; 8. Progress of Optics during the same period; 9. Progress of Astronomy during the same period. The remaining two
It appears then not only that the lunar month varies, but that there is no yearly cycle of variation. Before however we make any remark on the present subject, we must consider it by its side materials for confidence in the slavonicam whence the preceding times were quoted. Taking as hazard a volume of atmospheric observations, and opening part of the pages where the moon was found, we took the first right ascensions [ASCENSIONS] of the moon which we came to, opposite to which, for comparison, were written the right ascensions of the moon for the same times. The dates matter nothing, since the only accuracy of prediction of observation which is to be noticed. (Camb. Obs., 1835, p. 126.)

<table>
<thead>
<tr>
<th>Predicted R.A.</th>
<th>Observed R.A.</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>h. m. s.</td>
<td>h. m. s.</td>
<td></td>
</tr>
<tr>
<td>23 5 37:87</td>
<td>14 0 56:61</td>
<td>9 51:26</td>
</tr>
<tr>
<td>23 1 58:54</td>
<td>14 56:14</td>
<td>8 02:40</td>
</tr>
<tr>
<td>4 56 13:31</td>
<td>4 56 14:01</td>
<td>00:29</td>
</tr>
<tr>
<td>18 7 40:74</td>
<td>18 7 40:50</td>
<td>00:24</td>
</tr>
</tbody>
</table>

The lunar theory then, resting upon the Newtonian doctrine, enables astronomers to find the position of the moon within a part of the heavens answering to a second of diurnal revolution, while the rough observations with which astronomy must always commence would not give the length of a lunation within an hour.

Taking the lunar phenomena in the order of discovery, we next notice that this planet writes its mark on the earth in a series which renders it one of the easiest and most frequent objects of astronomical inquiry. The alternate rise and fall of the waters, called the tides, is found to follow its motions, so that high water is always found to succeed the time when the moon is at its greatest distance, or invisible side of it. At first sight it would appear that there is high water twice a-day (that is, in the common solar day), but it is found on further examination that the interval between high water and high water is a little more than twelve hours. The moon causing 13th to 23rd increase of right ascension in each solar day, or 15th 23rd in a sidereal day, or actual revolution of the earth. Hence the meridian of the spectator, between two times at which the moon is on the visible side of that meridian, must make a mean motion of 15th to 23rd per day, or 15th to 23rd per sidereal day, or 15th to 23rd. As every reader may not be acquainted with the distinction of sidereal and solar time, we may here simply state (referring to Sun and Times for detail) that the common day is that interval of time which the earth occupies in its simple revolution around the sun, and which includes the additional time in which the meridian overtakes the sun, which has moved forward about a degree. Thus it appears, that even on a single year the coincidence of half a lunar day and the interval between two times at which the moon is sufficiently apparent. It may be said that we have assumed the question by counting the times of high water from an almanac constructed on the supposition which we wished to establish. This would be true if we had talked of the year 1843, but the may consider an almanac for 1833 in the public papers if there had been a tide more or less in the Thames than was predicted in the almanac. The theory of the tides is the most difficult in astronomy, owing to the disturbing action of winds, charlocks, &c. and its intrinsic mathematical difficulties; but this one phenomenon has never had its exception in open sea—that every transit of the moon over (either side of) the meridian is followed by the rise of the water, though so high a wind has been known as to prevent the ebb. The moon being not luminous itself, but receives its light from the sun,

The reader is referred to Mr. Lubbock’s lately published treatise on the time for proof of the rapid progress which the minute accordance of prediction and observation is making.
To show how this may be, suppose a ball, illuminated by another ball at a great distance in the direction ES, to be carried round the spectator at E. This ball may be always subdivided into a visible and invisible half, since one-half must hide the other in all positions. But it may also be divided into an illuminated and unilluminated half. At A the visible half is all unilluminated, and though we have called it the visible half (meaning in a position to be seen, if there were light), it will not be seen. But when the ball arrives at B, a small portion of the illuminated half is visible, and at E a full half of the visible surface is illuminated. A little consideration of this scheme (which is moreover explained in all popular works) will show not only the occurrence of phases precisely similar to those of the moon, but also that the circular boundary of the enlightened part is towards the illuminating body. We copy from Riccioli his collection of the Latin and Greek terms used with respect to the different phases:

A. **Novilunium, luna silens, Conjunctio**, 
B. **Congressus cum sole, Neomenia, Synodus, Lune ascension.**

B. **Prima phasis, Nova luna.**

C. **Ultima phasis.**

D. **Luna novissima, Interterminum, seu interterminatum, et primam phasim, A C ad B.**

E. **D, C, E, Corniculata, Falx, curvata in cornus.**

F. **Primus sextilis aspectus, et E secundus.**

G. **Prima Quadratura, G secunda; luna, dividua, bisecta, dimidiata, semiplena.**

H, K, L, I. **Luna Gibba, gibbosa; H primo, I secundus aspectus trinus; L una in triparto.**

M. **Plenilunium, Opposito, Luna Totius, uninum, in diametro sinuata in orbem, medio mensis.**

N. **Luna crescens ab A per F in M, Luna descescens seu sesescens ab M per G in A.**

If the moon moved in the plane of the ecliptic, or of the sun's motion, as in the figure, there would be an eclipse of the sun at every new moon (A), and of the moon at every full moon (M); since in the former case the moon would hide the sun, and in the latter the earth would intercept the sun's light. The moon however is generally a little on one side or the other of the ecliptic, not enough to introduce any sensible error into the preceding explanation of the phases, but enough to hinder the eclipses from taking place, except now and then: we shall see more of this presently. Again, if the sun remained in the line ES, the lunation, or complete cycle of phases, would be of the same duration as the actual rotation of the moon round the heavens. Since however the sun moves slowly forward in the same direction to the moon, the latter does not alter its place so rapidly as in the figure, nor is the cycle of phases complete until the moon has overaken the sun.

It is usual to divide the whole lunation into four quarters, the first from new moon to increasing half moon, the second from half moon to full moon, the third from full moon to waxing half moon, the fourth from half moon to new moon. Each of these is called the change of the moon, and it is a very common belief that a change of weather and wind is to be expected, if not at every change of the moon, at least oftener at the changes than in the intervals. This opinion, when not absolutely received as true, is usually treated as the extreme of absurdity. It is in truth neither one thing nor the other, as the following considerations will show.

The atmosphere is continually undergoing a slight alteration from the effects of the tide. At new and full moon (or rather a little after these phenomena) there are those great tides called the spring-tides, arising from the action of both luminaries; at the two quarters the same luminaries oppose each other, and the quarters are followed by the smaller floods, called neap-tides. What effect may be produced by this succession of smaller and greater oscillations of the sea, which must produce oscillations of the atmosphere, it is not possible to say exactly. Again, we know nothing of the electric action of either luminary upon the earth, or whether any and what electric state may depend upon their relative position. We have therefore no grounds for thinking that the water in the ocean springs prior to the moon, and that the opinion upon the effect of the heavenly bodies upon the weather; and we shall now state the results of such facts as observation has furnished. A few years ago Mr. Arago collected the evidence on this subject in an article published in the 'Annales de Chimie.' He considered the general result to be this: that there is, upon the whole there is a little more rain during the second quarter than during either of the others; but that there is no reason to confirm the common notion that a change of the moon is accompanied by change of weather. It has also been observed that the horse, the bird, and the general course of the animal kingdom is, one time with another, less in the middle of the second quarter than in that of either of the others; and that it is somewhat greater at new and full moon than at the quarters. With regard to a great many other effects observed in the moon, its motion, and vegetable life, it can only be said that there is no conclusive evidence for or against them; nothing but a long series of observations can settle such points, and this is not likely to be made (or if made, to be made final) by the man who has predicted more than one eclipse in one way or the other. For an account of M. Arago's paper, see the 'Penny Magazine, Nos. 53 and 54.'

The moon's age is usually reckoned from the new moon, and the rules by which Easter is found depend, or should depend, upon a correct knowledge of the time of the rising, or setting, of the moon, or, in Ptolemaic terms, the 'Epsct.' But all readers should remember that the sun and moon by which Easter is found are not the real bodies, but fictitious ones, moving not with the real but the average motions, and therefore sometimes before and sometimes behind the real bodies. It should then be no matter of surprise if, as will happen, Easter-Sunday should sometimes be seven days sooner or later than it would be if the real bodies were employed.

We now come to the actual motion of the moon round the earth, which is the most complicated question in astronomy. Roughly speaking, it may be said that the moon's motion is circular, which is sufficient for the explanation of the phases; it is somewhat, but very little, more correct to say it is elliptical. If the moon's orbit were actually exhibited in space, an ellipse might be found which would nearly fit one of its revolutions; but the succeeding revolutions would depart further and further from such an ellipse, so that there would again occur which is situated in space near to the ellipse with which we started. And though astronomers have found a way of simplifying the question, by supposing the moon's orbit an ellipse which itself moves in space, yet we may better explain the subject by arriving at that ellipse from the real motion than by beginning with it.

When the motion of the moon is watched in the heavens with instruments fitted to measure her apparent diameter, it is soon found that she changes her distance from the
Earth, remaining alternately larger and smaller. Her path is not very much inclined to the ecliptic, so that she is never 51° from some one of the positions which the sun has had or will have in the course of the year. We may explain the apparent path of the heavens by the following figure,

\[
\begin{align*}
\text{Earth,} & \quad \text{Ecliptic,} \\
\text{apo-gal}, & \quad \text{perigee,}
\end{align*}
\]

which represents a portion of the apparent heavens. \( T \) is the earth in the centre, \( xxxx \) is the circle of the ecliptic; \( yyyy \) and \( zzzz \) are small circles parallel to the ecliptic, and each distant from it in the heavens by an angle of 5° 57' 30". The moon may rise 8° 47' 16" above \( xxxx \), or fall as much below \( zzzz \); but these two circles are chosen because they are \textit{mean}, that is to say, for every revolution which rises above \( zzzz \) there will be another, described at some other time, at which it falls short of \( zzzz \); so that in a long series of years the sum of all the arcs by which con-

<table>
<thead>
<tr>
<th>Sidereal month</th>
<th>27</th>
<th>7</th>
<th>43</th>
<th>11</th>
<th>5</th>
<th>27</th>
<th>32</th>
<th>16</th>
<th>14</th>
<th>27</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lunation</td>
<td>29</td>
<td>12</td>
<td>44</td>
<td>29</td>
<td>29</td>
<td>35</td>
<td>35</td>
<td>29</td>
<td>29</td>
<td>35</td>
</tr>
<tr>
<td>Anomalistic month</td>
<td>27</td>
<td>13</td>
<td>18</td>
<td>37</td>
<td>4</td>
<td>27</td>
<td>34</td>
<td>39</td>
<td>35</td>
<td>29</td>
</tr>
<tr>
<td>Tropical month</td>
<td>27</td>
<td>7</td>
<td>43</td>
<td>47</td>
<td>27</td>
<td>34</td>
<td>47</td>
<td>27</td>
<td>34</td>
<td>47</td>
</tr>
<tr>
<td>Sidereal month</td>
<td>27</td>
<td>5</td>
<td>36</td>
<td>0</td>
<td>27</td>
<td>22</td>
<td>22</td>
<td>22</td>
<td>22</td>
<td>22</td>
</tr>
</tbody>
</table>

If we compare the lunation with the common year, we shall find that 235 lunations make 6939 days, while 19 years make 6939 or 6940 days, according as there are four or five leap-years in the number. Neither is wrong by a day; consequently the 6939 or 6940 years that are restored to the same days of the year. This does not absolutely follow, either from the preceding or from the method which gave it, since neither is the coincidence exact, nor are the months exactly equal. But it will generally so happen that it is found by the mean; and this is the foundation of the Meteoric Cycle. [See also \textit{Calippus}.] Again, 233 lunations make 6582-232 days, and 242 nodical revolutions make 6583-337 days, so that there is only 0'33 of a day, or 50 minutes difference between the two. Each of these lunations is the Saros, a celebrated Chaldean period, and contains numbers of days 18 years and 10 days, or 18 years and 11 days, according as there are five or four leap-years. It may be worth while to express these numbers of lunations in terms of the smaller period, the Metonic Cycle.

| Saros | 233 lunations make 241099 sidereal months, 236399 anomalistic months, and 241499 nodical months. |

The rate at which the moon moves is different in different parts of the orbit. We may speak either of the rate at which she changes longitude, latitude, or distance from the earth; and owing to the smallness of the inclination of her orbit to the ecliptic, the rate of the moon is the same thing as her motion in her own orbit. The quickest motion is at or near the perigee, and the slowest at or near the apogee. The moon's rate of motion follows no easily obtainable law, but varies distances, which are different for different months. The rate of change of latitude is greatest near the nodes, and the rate of change of distance from the earth is least at the apogee and perigee, and greatest at and about the intermediate points. We have hitherto considered the apparent path of the moon among the stars: we now pass to the real orbit in space. Her average distance from the earth is 22982175 times the equatorial diameter of the earth, which makes about 60 radii of the earth, or 237,000 miles. But the radius of the sun's body is 114 times the radius of the earth, so that the moon, having its centre in the earth, should contain every part of the moon's orbit, would not be a quarter of the size of the sun.

Again, the sun's distance is 23,984 radii of the earth, or nearly 400 times the moon's average distance. A good idea of the relative magnitudes of the distances may be obtained as follows:—Take a ball one inch in diameter, to be the sun, and another of one half an inch in diameter to be the earth, where the moon is at its perihelion; place these nine feet apart, and a proper idea of the distance of the sun, compared with its size and that of the moon's orbit, will be obtained.

To form a sufficient notion of the real orbit, imagine another body, directly under the moon on the plane of the ecliptic, to accompany her in her motion. Let \( S \) be the plane of the ecliptic, in which the sun must
be, and ALB a part of the real orbit, from an ascending to a descending node; L being a position of the moon, P is the projected body on the plane of the ecliptic; and the motion of P will be very nearly that of L, owing to the smallness of the rise of ALB above the plane of the ecliptic. The motion of the projected body will then be of the kind of which the following is an exaggeration.

Suppose the moon to set out from 1 on the left, being then in apogee, and also at a node: the projected body will then describe 111, &c., until it comes to its perigee at the first 2, which is in advance of the point opposite to the apogee. But the real moon will have come to the plane of the ecliptic before it is opposite to the first 1, so that at the first 3 the moon will be below the projected orbit. The projected body then describes 222… up to the next apogee 3, and so on; the real moon having come above the ecliptic before the last 2 but one. In the present figure the number of folds is limited, and the last joins the first; in the moon's orbit the number of folds is unlimited. The real relation between the greatest and least distances is slightly variable in the different folds; one with another it may be thus stated: 4% per cent. being added to the mean distance will give the greatest or apogean distance, and subtracted, the least or perigean distance. Taking the fiction of the moving eclipse for the moon's orbit, its eccentricity is 0.0349442.

In the article Gravitation will be found a sketch of the producing causes of the inequality of the lunar motions, showing that they arise from the effect of the sun's unequal attraction of the earth and moon; were it not for which, the latter would describe an ellipse round the former. In the present article we intend only to describe the motions themselves. We have pointed out both the apparent orbit in the heavens, and the real orbit; it remains to ask, in which manner is the real orbit described? At a given time, how is the moon's place in the heavens to be ascertained?

Returning again to the apparent orbit, we first consider motion in longitude only; that is, we ask how to find the moon's longitude at the end of a given time. Let us suppose then that, Q being the apparent place of the moon in the heavens, we draw QM on the sphere perpendicular to the ecliptic, so that M has the same longitude as Q. To connect the figure with the last, suppose that the moon was at L when it was projected in the heavens to Q, and let P be the projection of L on the ecliptic: then P will be thrown upon M in the heavens. The average motion of M will be that of the moon, or a circuit in 27°25'16" days. If then we were to suppose a fictitious moon setting out from M, and moving with this average motion, it would never be far from the point L; which last, from the irregularity of the real moon's motion, would be sometimes before and sometimes behind the fictitious moon.

If we could observe the fictitious moon, thus regularly moving in the ecliptic (say every day at midnight), and also the real moon, we might take a long series of years' observations, and sum all the excesses of M's longitude over that of the fictitious body, when there are excesses, and all the defects, when there are defects. We might expect to find the one sum equal to the other; and we are taught by the theory (which, as before seen, is exact enough to find the moon's place within a second) that the equality of these sums will not be absolutely attained in any series of years, however great, if we take the commencing point, at which M is to coincide with the fictitious body, as our own caprice.

Wherever Q may be, there is a proper place for this fictitious moon, before or behind M, from which if we allow the former to start, the longer we go on with the series of supposed observations, the more nearly will the excesses balance the defects; supposing always that our series of observations stops at the end of a complete number of circuits, and not in the middle of one. This is the true, or real place of the moon, as distinguished from Q, its real place.

Let us suppose it to be V; then if the average moon start from V, with the moon's average motion, it will at every instant of time point out what is called the mean place of the moon corresponding to the true real place.

At the commencement of the present century, that is, when it was 12 o'clock at Greenwich on the night of December 31, 1800, the longitude of the average moon, or the moon's mean longitude at those times (according to Ptolemy), was 11°17'32" 31', and the mean longitude at any other time is found by adding in the proportion of 4890°·58468 for every 365 days, and making the necessary additive allowance for the procession of the equinoxes. [Prescription.]

In the same way the node and perigee of the moon have their mean places, and, as we have seen, their mean motions. The mean longitude of the perigee, at the commencement of the century, was 266°10'7" 5; that of the ascending node 19°55'22" 31'.

To the node and perigee be added these average motions, as they are called, are subject to a slight acceleration, which hardly shows itself in a century: that of the longitude was detected by Halley from the comparison of some Chaldean eclipses with those of modern times. This acceleration amounts to 0.61° of the moon's orbit by 11°, that of the perigee by 50°, and that of the ascending node by 21°.

The mean longitude being ascertained for the given time, the true longitude is found by applying a large number of corrections, as they are called, some determined from the theory of gravitation, but the larger ones, as might be supposed, detected by observation before that theory was discovered, and since confirmed by it. Into this subject it will be impossible to enter at length; we shall therefore merely instance a few of the principal corrections for the longitude, observing that the latitude, the distance, &c. are all determined by adding or subtracting a number of corrections from the results of the supposition that the moon moves uniformly in the ecliptic at her average distance from the earth.

The first correction is one which brings the motion nearer to an elliptical one, and is called the equation of the center. This is the difference between the moon's true place from her perigee, which is called the anomaly. The mean anomaly is the distance of the moon's mean place from that of the perigee. The mathematical expression is (we give only rough constants),

\[ 5° 17' \times \sin (\text{mean anomaly}) \]

The second correction, known as the ejection, and discovered by Ptolemy, is,

\[ 1° 16' \times \sin \left\{ x (x - \theta) - \text{mean anomaly} \right\} \]
where $\phi$ and $\phi'$ stand for the mean longitudes of the moon and sun.

The variation and the annual equation (discovered by Tycho Brahe) are represented by

$$39' \times \sin 2(\phi - \phi')$$

and

$$11' \times \sin (\phi' \text{'s mean anomaly}).$$

Many such corrections (but those which remain of less amount) must be added to or subtracted from the mean longitude before the true longitude can be determined.

Having thus noticed the actual motions of the moon, we proceed to the phenomena of eclipses, and of the harvest-moon, as it is called. An eclipse of the moon has now lost most of its astronomical importance, and can only be useful as an occasional method of finding longitude, when no better is at hand. Eclipse of the moon, observed in the particular way, may be made useful in the corroboration of the theory both of the sun and moon; in this case matter is absolutely hid from view by matter, and the moment of disappearance can be more nearly and exactly determined. But in the eclipse of the moon, which is eclipsed by entering the shadow of the earth, the deprivation of light is gradual; so that it is hardly possible to note, with astronomical exactness, the instant at which the disappearance of the planet's edge takes place.

In a lunar eclipse the first thing to be ascertained is the diameter of the earth's shadow at the distance of the moon. Suppose this shadow, that is, its section at the distance of the moon, to be represented by the circle whose centre is C, and, N being the centre of the earth, the circle on the eclipsing body, the eclipsing body, and moves in the direction of the sun's general motion, or from west to east.

Let CA be the eclipse, and let BC be a part of the moon's orbit, the node at D. It must be remembered that the whole takes place on a very small part of the sphere, so that all the portions of the orbit which actually come into use may be represented by straight lines. Let the centre of the moon be at E when that of the shadow is at C; and let the hourly motions of the sun (that is, of the shadow) and of the moon be CF and EG. If then we communicate to the whole system a motion equal and contrary to CF [Morrison], the shadow will be reduced to rest, and the relative motion of the moon with respect to it will remain unaltered. Take EH equal to CF, and contrary in direction; then EL will represent the rate of the moon's shadow at one hour, and the times elapsed between that of the moon being in the earth and the phenomena in question. Such is the geometrical process: the one employed in practice is algebric, and takes in several minor circumstances which it is not worth while to detail.

An eclipse of the moon is a universal phenomenon, since the moon actually loses her light, in whole or in part; while in an eclipse of the sun, the moon hides the sun from one part of the earth, but not from another. The former can only take place when the conjunction (or sameness of longitude) of the moon and earth's shadow, that is, the opposition of the sun and moon, or the full moon, happens when the moon is near her node. The subject of eclipses is fully explained, with as little as possible of mathematics, in the Library of Useful Knowledge, 'Astronomy,' pp. 77-101. See also SUN: ECLIPSE. For the phenomena of the occultation of a star by the moon, see OCCULTATION.

By the harvest-moon is meant a phenomenon observed in our latitudes at the time of the full moon nearest to the autumnal equinox, when it happens for a few days that the moon, instead of being forty-two days, rises for several days nearly at the same time. Something of the sort takes place always when the moon is near her node; but the circumstance is most remarkable when it happens at the beginning of greatest opposition. The reason is that the increase of declination (which is most rapid when the moon is near the equator, which she must be when full moon comes nearly at the time of the equinox) compensates the retardation which would otherwise arise from her orbital motion. [Smyth.] See the treatise above cited, pp. 80, 81.

The discovery of the telescope, and the examination of the moon which followed, soon showed that the planet always turns the same face towards the earth, or near it. From hence it immediately follows that the moon must revolve round an axis in the same time as that axis revolves round the earth. If any one should walk round a circle without turning himself round, that is, keeping his feet always in the same direction, he will present alternately his front and back to the interior of the circle. But if he desires to turn his face always inwards, he must turn round in the same direction as he walks round. [Motion, Direction of.] If the moon moved uniformly round in her orbit, and had a uniform rotation in the same duration, then if her axis were perpendicular to the plane of the orbit, and the spectator were always at the earth's centre, the face of the moon would be always actually the same. None of these suppositions are true. 1. The motion in the orbit is irregular, while the rotation is uniform and exactly the sidereal month: the consequence will be that when the moon is moving quicker than the average, a little of the western side will be coming into view, and a small portion of the eastern side will be dark. 2. The axis of the moon is not perpendicular to her orbit, but is out of the perpendicular by an angle of 5° 8' 49''; the consequence is, that as she revolves in her orbit, the north and south poles of the moon will alternately become invisible, each during half a revolution. 3. The spectator is in motion round the earth's axis, which will slightly vary the part seen of the moon in the course of the day. These effects are called librations: (1) the libration in longitude, (2) the libration in latitude, (3) the diurnal libration. The second will be elucidated in SEASONS, CHANGE OF, and the third in PRECESSION AND NUTATION.

The way in which we know that the face presented is always nearly the same, is by observation of that face, which is varied by the librations above mentioned. Observing is a view of the average face in the mean state of libration, that is to say, no part of the present edge is ever hidden by libration, without as much of the opposite edge being hidden at some other time.

One cut represents the appearance of the planet; the other is a plan on which numbers and letters are laid down, referring to the following list, which contains the names usually given to them, and which were given by Riccioli, whose nomenclature has been generally adopted. Many other names are given, but the following are the most remarkable—

1 Pythagoras. 20 Petavius.
From the manner in which the moon is seen, as well as from the stars, when she approaches near them, undergoing no refraction whatever, it is certain that she has either no atmosphere, or one of a degree of tenuity which must exceed, perhaps, that of the best exhausted receiver. From this it has been inferred that there are no fluids at the surface of the moon, since, if there were, an atmosphere must be formed by evaporation. It is however enough to say that the fluids, if such there be, must be very different from those which abound at the surface of the earth. Since the moon has a day (with reference to the sun) of a whole sidereal month in duration, each part is 14 days in sunlight, and 14 days without it. The intense heat and cold which must thus alternate would destroy human life, even on the supposition that terrestrial vegetation could be maintained. The fluid on the warm side (if any) must be constantly evaporating and passing off to the colder side.

The consequence must be absolute aridity below the vertical sun, constant accretion of hoar frost in the opposite region, and perhaps a narrow zone of running water at the borders of the enlightened hemisphere. It is possible, then, that evaporation on the one hand, and condensation on the other, may, to a certain extent, preserve an equilibrium of temperature, and mitigate the extreme severity of both climates. (Sir J. Herschel, *Astronomy*, p. 230.)

The mass of the moon, as determined from her effect upon the earth's motion, is about one-eighth (or \(0.125\)) of that of the earth, her volume is one-forty-ninth of that of the earth, and the average density of her material \(615\), or about six-tenths, of that of the earth. A body weighing six pounds at the earth would weigh one pound at the moon, if tried against weights which retained their terrestrial gravity. Travelling 10 miles an hour on the surface of the moon, would enable a person to keep up with the sun; so that it is not at all impossible that animal life may be maintained by constant migration, keeping always near the boundary of light and darkness.

The surface of the moon exhibits a very large number of mountains almost universally of an exactly circular or oval shaped form, foreshortened however into ellipses near the limb; but the larger have for the most part flat bottoms within, from which rise centrally small, steep, conical hill. They offer in short, in its highest perfection, the true volcanic character, as it may be seen in the crater of Vesuvius. . . . . And in some of the principal ones, decided marks of volcanic stratification, arising from successive deposits of ejected matter, may be clearly traced with powerful telescopes. What is moreover extremely singular in the geology of the moon is, that although nothing having the character of seas can be traced (for the dusky spots which are commonly called seas, when closely examined, present appearances incompatible with the supposition of deep water) yet there are large regions perfectly level, and apparently of a decided alluvial character. (Sir J. Herschel, *Astronomy*, p. 229.) The mountains are known by their shadows, which are perfectly visible, and which are long when they are near the boundary of light and darkness, or when the sun is in the horizon, and disappear when they
are 90° from that boundary, or when the sun is overhead. We copy from Schroeter’s ‘Selenotopographische Fragmente’ two representations of the spot Archimedes, the first when very near the dusk part, the second when far from it.

By the help of these shadows, as well by other means, the heights of many of the lunar mountains have been measured, and some have been found whose heights exceed a mile and a half.

It might be supposed that nothing could ever be known of the figure of the moon, since we can only see one side. But this very circumstance leads us to some knowledge on the point. It is impossible to believe that the moon should revolve on her axis precisely in the same average time as she revolves round the earth, without half a second of difference, and not to suppose that there is some mechanical connection between the two revolutions, so that either one is a consequence of the other, or both are consequences of some common cause. As this subject is rarely elucidated in elementary treatises, we have somewhat abridged several of those topics which are usually treated, in order to supply considerations for which we could only refer to treatises of the most mathematical character.

It is well known in mechanics that the rotation of a body is in no way affected, if we suppose its centre of gravity to be fixed instead of moveable, provided the same forces act in both cases. Thus if a stick be tossed into the air (or rather into vacuum) by an impulse communicated at one end, and the same impulse be communicated to a similar stick which revolves on its centre of gravity, the first in its combined rotation and translation, and the second in its rotation only, will always remain parallel to each other, if they were so at first. Let us now suppose a needle placed on a point, and magnetic, round which a ball of iron revolves from A. If the needle be first at rest, then when the ball moves towards B, it will endeavour to draw the needle towards the position ON, and the needle will begin to revolve in the same direction as the ball. Suppose that by the time the needle points to ON, the ball is at OC; OC and ON being perpendicular; the ball then acts equally on both sides of the needle, and all acceleration of the rotation stops. When the ball arrives at D, it is tending to destroy its former effect, pulling the end P towards it. It may thus be seen that if the needle were heavy enough, the ball would by its motion cause an oscillation, working to produce rotation in one direction during half its revolution, or
rthur more, and the opposite effect during rather more than another half revolution, in alternate quarters. But if the needle were light enough, it is easily seen that the rotation in the first direction might be produced so rapidly, that the second mode of action should never be exerted, or the revolving ball should never so far outstrip the needle. N O C should become n e g l e c t e d. In this case the action would go on in one direction until the needle would acquire a rotation equal to and even exceeding that of the ball. But in the latter case, when the needle overtake and passes the ball, the opposite action would be immediately lessened, and a rotation would be checked. The end would be, that the needle would acquire a rotation equal to that of the ball, on the average, and would revolve so as always to present its point either to the ball, or alternately a little to the right or left of it, as the case might be; or, if the needle were odd shaped, or not perfectly round, or if the ball were odd shaped, the needle, at the commencement, had a rotation nearly equal to that of the ball; the consequence would be, that the action in one direction would continue long enough to establish permanent equality of the average rotations. Without supposing the moon a long needle, with one end turned towards the earth, it is found by calculation, that it is sufficient to suppose it slightly spherical, with the longer axis towards the earth. The same mathematical considerations which have so completely resolved the poles, show also, that the moon must be an ellipsoid [SURFACES OF THE SECOND DEGREE] revolving round the shorter axis, and presenting the extremity of the longer axis to the earth. But the proportions of these axes have not been well determined, from which we can form a clear idea of the figure of the moon. It is but comparatively lately that even the inclination of the moon’s equator to the ecliptic has been determined at 1° 30’ 10’’; that of the equator to the orbit being 5° 47’ 12’’.

One very curious phenomenon has been shown to be of the same kind as the preceding; namely, of the sort which must be made absolutely true by the earth’s attraction, if it were nearly true at the beginning. The moon’s equator cuts the ecliptic in a line which lies very nearly so, to the mean position, for the time being, of the line of nodes of the moon’s orbit. If the axis of the moon’s rotation were perpendicular to the ecliptic, this must be the case, for the moon’s equator and the ecliptic would then be parallel planes. And the moon’s axis being nearly perpendicular to the ecliptic, it may be shown from spherical trigonometry that the two lines in question could not make an angle of many degrees. But the fact observed by Dominici Cassini, before the theory of gravitation was thought of, is either actual paradox, or something differing from it by very trivial oscillations. It is difficult to represent this phenomenon to a person unacquainted with geometry. It may be thus stated: the moon’s orbit, the ecliptic, and the moon’s equator, are three planes which form an equilateral prism when produced. Or thus: if the moon were made to revolve rapidly round its axis, and if the earth were made of light and givin: seasons to the moon, as the sun does to the earth, then the nodes of the moon’s orbit on the ecliptic would coincide with the equinoxes, and the moon’s orbit would be divided into summer and winter paths by the same line as that in which the sun’s path cuts the orbit.

A great many miscellaneous phenomena connected with the moon might be collected, for which we have not space. For the light thrown on her surface when eclipsed see REFRACTION, for a remarkable appearance sometimes observed when she passes over a star see OCCULTATION; for her use in finding LONGITUDE, see that word.

MOON, USES OF THE [MOON].

MOON, SUPERSTITIONS RESPECTING THE. Brand, in his ‘Popular Antiquities,’ gives a long list of lunar superstitions. It was formerly conceived that if hogs were in the moon, the bacon would improve; and if cows were in it, the cheese would improve; if a dog, the meat would improve. It is now known that all such statements are without foundation.

In Decker’s ‘Match me in London,’ act i, the king says,—

“My lord, do you see this change? th’ moon? Sharp horns do threaten windy weather.”

Wren, in his ‘Discourse upon Superstition’ (Traity, Svo, Lond., 1748), p. 6, speaking of a superstitious man, says, ‘He will not commit his seed to the earth till he observes the rising of the moon, and then he will not sow till he has his hair cut when the moon is either in Leo, that his locks may stare like the lion’s shag; or in Aries, that they may curl like a ram’s horn. Whatever he would have to grow, he sets about it when she is in her increase; but for what he would have to wither, he waits till the moon is in Taurus, he never can be persuaded to take physic, lest that animal, which chews its cud, should make him cast it up again. If at any time he has a mind to be admitted into the presence of a prince, he will wait till the moon is in conjunction with the sun, for ‘tis then the society of an inferior with a superior is salutary and successful.’

Aubrey, in his ‘Miscellaneous,’ says, ‘At the first appearance of the new moon, he would say any other new moon is as good, go out in the evening and stand over the spars of a gate or stile, looking on the moon, and say—

All hail to thes moon, all hail to thee,
Innocent go good moon.
This night who my husband (wife) shall be.

You must presently go to bed. I knew two gentlewomen that did this when they were young maids, and they had dreams of those that married them.’ Dr. Jameson has quoted these words as used in Scotland, in a different form.

Tacitus, in his ‘Manners of the antient Germans,’ observes that ‘they hold their meetings on certain days, either at the new or full moon; for they consider these the most favourable times for conducting a rooming or entering on a quarrel.’

Brand quotes Duchesne’s ‘History of England,’ p. 13, where, speaking of the Irish, he says, ‘Quand ils voyent la nouvelle lune, ils fassechissent les genoux et reciennent l’oraison dominicale, a la fin dequelle ils disent a haute voix, je vous prie, a tous les yeux, oh! oh! oh! et au loin ces petits sauts que nous a trouvez;’ which Vallency confirms in his ‘Collectanea de Rebus Hibernicis,’ No. xii., p. 91. ‘The vulgar Irish at this day retain an adoration to the new moon, crossing themselves, and saying, “May thou leave us as safe as thou last found us.”’ Park observed a similar practice in the interior of Africa among the Mandingoes.

The Man in the Moon, one of the most antient and most popular of our superstitions, is supposed to have originated in the Book of Numbers, ch. xvi., v. 32, scc, of a man who was punished with death for gathering sticks on the Sabbath-day.

MOON SEED is the seed of various kinds of Menispernum, and is sometimes called the ‘seed of the moon.’ It is often boiled and eaten either too porous to retain it, or too impervious to allow it to escape. Both extremes occur in some moors, which are parched up in dry weather, and converted into a dark mud by any continuance of rain. A considerable portion of room in a state of hydrate is also generally found in the soil of moors, which is very hurtful to the vegetation of plants, except heath, furze, and other coarse plants, which almost entirely cover the moor. This iron is carried down through the light surface-soil, and, if it meets with a less porous earth below, it is entirely deposited in the soil in the form of minute particles of silicious sand, which are carried down with it, and forming what is called the heath-pan or moorland. This substance is perfectly impervious to water, and wherever it exists in a continuous state, all attempts at improvement are of no avail.

The roots of trees occasionally find a passage through interstices or fractures of the pan, and then often grow luxuriantly. But wherever young trees are planted, without the precaution of breaking through the impervious pan, the valuable soil is rarely if ever found, and disapponts the expectations of the planter, who, seeing fine large trees growing around, naturally imagined that the soil was peculiarly fitted for them. If the stump of a large tree, which has been cut down, is grubbed up, pieces of the moor-bank may often be seen all around...
The stem, at a short depth below the surface, so arranged as to show evidently that the tap-root, having found an aperture, and extending its fibres downwards into a better soil, bears swelling, broken the paste and pushed aside. Where the vernal consists of a loose peaty earth of little depth incumbent on a rock, as is the case in many mountainous countries, no art can fertilize it. In dry weather the whole surface has the appearance of a brown powder like snuff, which is a matter of soil and want of water. The surface will soon show a manifest change by the increase of green patches, and a subsequent liming will complete the improvement. When the health of the stock, as well as the increase of food, is taken into the account, it will be found that such an improvement of vernal-land soon results in the outlay.

When the surface of the ground is very uneven with protruding rocks, interspersed with large stones, the only improvement which can be undertaken is to plant trees, chiefly of the fir or pine tribe, which will grow well if put judiciously. The vernal is then broken by tamping or by means of heavy-pointed iron bars thrust into the earth with considerable force, wherever a plant is put in. If there is a rock below with six inches of earth over it, provided it be not of a very compact and solid nature, the fir-trees will grow rapidly, and the roots will generally be set to the pressure of the soil, and begin in a sheltered spot, and it may be enlarged every year towards the more exposed side. Thus even the highest and bleakest hills may in time be covered with wood, and, if properly managed, cannot fail to be profitable. [Plantations.]

Moss-land. Moss-land is the darest situation, the difference being so very distinct in its nature. Moss-land is produced by the accumulation of aquatic plants, and its origin is chiefly vegetable. When it has a considerable depth, and its substance has lost all power of vegetation, it forms peat-bogs of a various depth, as the water is easily retained, which keeps up a kind of natural vegetation, by which the quantity of moss is only increased. This is the substance which covers the surface of bogs, and where it is of some consistence it allows a passage over them [Box]; but where it is very thin and loose it does not keep the eye by an appearance of solidity, like that of a smooth grass or a gravelly surface, but to the pressure of the foot, and allows it to sink through with very little resistance. The only way to improve moss is to drain it, and then convert the vegetable matter of which it is composed into soil, by means of lime and pressure. The latter is effected by putting on a considerable quantity of earth, especially sand and gravel, which, incorporating with the moss, consolidates it, and assists the lime in decomposing the vegetable fibre. After this it becomes a valuable, though extremely fertile, deposit for pasture purposes, and is much valued. And whenever it has acquired sufficient solidity by the treading of sheep and cattle, it will produce good crops of wheat, or, if laid down to grass, give abundance of hay and pasture. Trees do not thrive in mossy soil, there being too little solid matter, and the large trunks which are frequently found in bogs must have grown before the moss was formed. This may be easily imagined. A wood laid flat by a storm or hurricane may obstruct the natural flow of the waters, and cause them to accumulate. The prostrate trees become surrounded by aquatic plants, which spread their fibres and roots freely through the water, and, decaying, make room for others. Thus the trees are gradually covered and buried in the moss till future generations find them, when the moss is of such a thickness as not to allow the pressure of the foot, and then the wind from the atmosphere absorbs fertilising portions of the atmosphere, and be much improved. It may then be ploughed in with a shallow furrow, and incorporated with the natural soil by harrowing. A small quantity of lime and manure will bring this mixture into a productive state.

There are many moors which, although incapable of profitable improvement as arable land, may, at a comparatively small expense, be much improved as pasture for sheep and cattle. The vernal is then broken by tamping, and the surface is draining by ditches, and enclosing the fields with banks or stone walls, both as shelter for the stock and convenience of feeding. The hearth may be burnt and the ashes spread about, and the surface having been scarified to the depth of a few inches, some grass-seeds suited to the soil and climate may be sown. The vernal will soon show a manifest change by the increase of green patches, and a subsequent liming will complete the improvement. When the health of the stock, as well as the increase of food, is taken into the account, it will be found that such an improvement of vernal-land soon results in the outlay.

Moor-Buzza, the English name for Circus ericinus of Aldrovandus aud authors. [FALCONER, vol. x., p. 183.]

Moor-Cock, one of the names of the Red Grouse. Moor-Fowl, one of the names of the Red Grouse. Moor-Hen, the common English name for the Gallinula, or Water-hen, Fulica chloropus, Linnae.

Moor-Titling, one of the names for the Chick-stone, Stone-chatter, Stone-nest, Stone-smith, and Stone-smick, Saxicola rubicola, Bechst.

Moore, Edward, a writer of some dramatic
poetical reputation, was born in 1712, and bred to the business of a linen-draper, which he followed for some time in London, until he deserted it for the pursuit of literature. He married a lady, named Hamilton, of a strong poetical vein, who was supposed to assist him in his writings. His first metrical work was "Fables for the Female Sex," which, though in humour and elegance far inferior to those of Goldsmith, have numbered him by their pleasing versification and well pointed morals, among the happiest imitators of that writer. These fables were succeeded by "The Trial of Selim the Persian," an ingenious complimentary effusion on Lord Lyttleton, in return for some favourable notice from that nobleman.

Moore's dramatic pieces were, two unsuccessful comedies, "The Foundling" and "Gil Blas," and "The Gamester," a tragedy, which, though he had placed his play on a high level, never reached its place on the stage, and its hold on the feelings, by a natural and affecting exhibition of domestic misery. The last literary undertaking in which Moore became engaged was the editorship of "The World," a miscellaneous weekly paper, to which Lords Lyttleton and Chesterfield, Horace Walpole, and other distinguished persons of the day contributed. The series closed with the death of Moore, which occurred in 1757.

MOORE, Dr. John, M.D., better known as a miscellaneous writer than as a doctor, was the son of a minister of the Scotch church, and was born at Stirling in the year 1729. In his youth, after having studied in the university of Glasgow, he served for a time as a medical officer in the British army in Flanders, in 1747-8, and subsequently became a member of the household of the English ambassador at the court of Versailles. Having passed some years abroad in these stations, he returned to Scotland, and entering into partnership as a surgeon, settled at Glasgow, from whence, after taking his degree as physician in London in 1768, he proceeded to the young duke of Hamilton to the Continent, in the joint capacity of medical attendant and travelling tutor. With his charge he spent five years in visiting some of the most interesting countries in Europe, and returning home in 1778, and establishing himself in London, he pursued his observations of foreign countries to the world in two lively works, under the title of "A View of Society and Manners in France, Switzerland, and Germany," and "in Italy," etc., his first literary auditions, were followed by a volume of "Medical Sketches," and by "Zelucu," the ablest and most popular of his novels, in which he has powerfully portrayed the dreadful effects of indulgence upon a disposition naturally selfish and cruel. His succeeding works were "The Revolution of 1792," "A View of the Causes and Progress of the French Revolution," "Edward," a novel, "Mordaut," or Sketches of Life, Character, and Manners in various Countries," and an edition of Smollet's works, with a memoir prefixed, in which a personal character is said to have been adorned with many estimable and pleasing qualities; the knowledge of the world which he had acquired in foreign travel caused his society to be much courted; and his conversation, aided by a countenance full of expression, was distinguished by the same tone of moral sentiment, as well as by the same shrewdness of remark and caustic humour, which appear in his writings. He died at Richmond, near London, in 1786.

A complete edition of Dr. Moore's works in seven volumes, with an apparently accurate Memoir of his Life, by Robert Anderson, M.D., was published in Edinburgh, in 1817.

MOORE, SIR JOHN, a lieutenant-general and knight of the bath, one of the most distinguished British officers of modern times, was the eldest son of the author of "Zelucu." He was born at Glasgow in the year 1761, and received his first commission in the army at the age of fifteen years. The boldness of his character and the rapid advancement; and before he found the earliest occasion of proving his personal merit, he had already been some years a lieutenant-colonel, and had also sat in parliament for the Leicestershire district of Burton-Upon-Trent. He was in the descent of the British arms against Corunna, in 1794, in concert with the patriotic Pauli, that Moore first distinguished himself; and in subsequent services, in the West Indies in 1796, in Ireland during the rebellion of 1798, and in the disastrous expedition to Holland in the following year, in which he received two severe wounds, he fully established for himself the reputation of an officer of the highest promise. A more auspicious duty now awaited him; and in the expedition to Egypt in 1801, with the rank of major-general, he commanded the reserve of the army, and highly distinguished himself at its head. For his services in this campaign, in which he was severely wounded, he was deservedly created a knight of the bath.

On the recommencement of hostilities, after the short peace of 1802, Moore was usefully employed, by his own desire, in a camp of instruction on the Kentish coast, in saving his troops from the saps and trenches of the French infantry; and these troops, of whom the renowned light division of the Duke of Wellington's army in the Peninsula War was afterwards composed, gave by their achievements the best possible illustration of the doctrines which they had been instructed in the school of Moore. The flexibility and simplicity of movement, which he had substituted for some of the pedantry of the German tactics, were found as desirable and as well calculated for the general service of his troops as the light divisions in the south of France. Moore's improvements have accordingly been incorporated into the existing regulations for the exercises of the British army.

From the business of tactical instruction, Moore was called to more active service; and after being for some time employed in the occupation of the Rhine, at the head of a body of about 10,000 men, to Sweden, with a view of aiding the gallant but unreasonable sovereignty of that country, Gustavus Adolphus IV., in the defence of his dominions against the designs of Napoleon. On the disastrous news of his death in battle with the eccentric king, from which he, without some difficulty, extricated himself and his troops; and he returned with them to England at that crisis in the war against France, which opened to the British arms a new field of operations in the north of Europe. In every general who had negotiated the Convention of Contras, he was appointed to the command of the army which, to the number of 5000 cavalry and 30,000 infantry, was intended to co-operate with our Spanish allies in the north of the Peninsula against the French invaders. Of this auxiliary army, part was to arrive direct from England under Sir David Baird, and to land at Corunna, while the greater proportion, composed of troops already in Portugal, was to be landed by Moore through Ferrol, or, by a more direct route, from Cadiz. He accordingly began his march from Lisbon in October, 1808: but he had scarcely entered Spain before the defeat and destruction of the Spanish armies at all points on their northern line utterly extinguished the prospect of a successful campaign. Failing in these hopes, a false story was spread that the besieged of Almeida, by which his infantry had advanced, was impossible for artillery, he had imprudently been induced to send his cavalry and guns, under Sir John Hope, by a circuitous southern route through Badajos; to the north, a long tract of country at his disposal, from which he could land troops under Baird at Corunna; and with forces thus widely disjoined, he found himself exposed to the assaults of victorious and rapidly advancing French armies of immense numerical superiority. In this critical position, he remained for some time inactive at Salamanca, and was expected by his superior to be the first to give vent to the fierce spirit of the enemy. The surrender of that capital soon dispelled so much of the ambassador's illusions: yet the intelligence was followed by some indecisive movements on the part of the British general against the advanced French forces. Sir John Moore had reason to believe that the whole of the disposable French armies in the Peninsula were gathering to surround him. Rejecting all hope of the defence of Portugal, he commenced a rapid march; but not too precipitately, to Corunna: the sufferings and disorders of which, conducted as it was in the depth of a severe winter, and through the mountainous region of Galicia, will long be remembered in our military annals. Its disasters were closed, on the 16th of January, 1809, by the battle of Corunna, in which the troops, though previously in
all appearance exhausted and disorganised, were reanimated, by the traitor of their gallant leader and their own native valour, to inflict a deadly reverse upon their pursuers.

Their triumph was dearly purchased by the loss of their commander; the circumstances of whose death may challenge and support a comparison with the most illustrious examples of heroic and modern times, with the last moments of an Epaminondas, a Bocklin of the War. He probably had little desire to survive the mental agony which he had suffered in so disastrous a retreat; he expressed great satisfaction that the enemy were beaten; he requested to die in that way; and his expiring words breathed a hope that 'the people of England would be satisfied—that his country would do him justice.'

The operations of the memorable campaign which Moore and his forces had so gallantly conducted after the event with all the virulence of faction by conflicting parties, who either desired to shift the blame of failure from the government on the general, or to transfer it from him to his employers. Scarcely inquired has the question which must determine Moore's claims to the character of an able commander, been impartially treated to this day. The noble and graceful virtues of his private life, his lofty and generous sense of honour, his chivalrous courage, his forebearance of every misfortune, his loyalty to service of his country, even his enemies have been unable to deny. In station of subordinate command, he had also unquestionably displayed very considerable talents, and a perfect acquaintance with the science of his profession. But under the command of a superior officer, he was probably as inefficient as any in the field; and the fact whether he possessed the highest qualities of military genius must be tried by his conduct in that arduous service. He was placed in a position of the utmost difficulty; with an army, which, though full of courage, was untrained, and not insurmountable by a command with an inexperienced staff, and a commissariat wretchedly defective; without the means of obtaining either information or supplies, in a country where warfare has, in all probability, been throughout supported by voluntary contributions, and against an army ably commanded, thoroughly organised in every department, long seasoned to warfare, and immensely superior in numbers. These were difficulties under which any but the commander of first-rate ability and unshaken confidence in the resources of his own comprehensive intellect was sure to sink; and that Moore was not found equal to them is no more a subject of reproach upon his zealous and gallant conduct in such form of service as the genius of a Fabius or a Wellington. He wanted in fact that perfect undoubting trust in himself, in every adversity, which is characteristic of the greatest commanders, and below which no man is ever considered as first in his own army, or ever errected that of his opponents.

From the first to the last, he desponded of fortune, and fore saw only disasters; he hesitated only in vigorous action, and decided upon nothing but failure. The Duke of Wellington has generously said, that he could discover only one error in Moore's campaign, in not providing for retreat when he advanced against Soult: but the neglect of preparation for an orderly and gradual retrograde movement through the strong country of Galicia was only indicative of the same absence of all hopefulness, which had already pronounced Portugal itself indefensible. How the events of the following campaigns refuted this opinion need not here be said; but Moore, in his despair and dread of responsibility, abandoned every thought except the preservation of the army.

That he had the object without disturbance is sufficient to redeem all the errors, if such there were, which had attended his career; and it should ever be gratefully remembered to his glory, that, when there were those under him who had deserted the cause, of which he desired to remain a faithful disciple. In convention with the French for obtaining permission to embark unmolested, he indignantly spurred the proposal, as unworthy of a British army which, amidst all its sufferings, had never known defeat. He welcomed indeed a battle as the subject of his staunch character; he despised the ultimo of his retreat; he was as devotedly of victory on the coast at Corunna, as he had been apprehensive of destruction in the interior of Spain; and in that last act of untaunted firmness, he put a seal with his blood to a whole life of magnanimous devotion.

The personal history of Sir John Moore has been written at some length in a memoir contained in the third volume of the Athenaeum (London, 1834): but elaborate investigations of his last campaign may be found in the 'Narrative' of his brother (London, 4to, 1809), and in a criticism on it in the 'History of the War in Spain' of the Marquis de Granada, &c. (Alhambra), still attest both their skill and taste. Although some have spoken very slightly of this style as exceedingly fanciful and capricious, by others it has been rapturously extolled as the most poetical and fairy-like species of architecture, and originally characteristic of a refined, luxurious, and imaginative people; and although it must be confessed that it is not reducible to any fixed rules, it is evident that it was formed according to consistent prin ciples of itself; and that it is marked by a strong national physiognomy. One of its most striking characteristics is the horse-shoe arch, or, as it might with more propriety be termed, the crescent arch, because it resembles that symbol of Mohammedan faith, and was therefore in all probability imitated by the Moors when they were submitted, at once and naturally accounts for a form that is also very unlikely to have suggested itself, or to have originated in any purpose of construction: so far therefore this hypothesis of ours—for we have not borrowed it from any one else—has something like a plausible basis to rest upon. Perhaps, too, the same religious symbol may be recognised in the smaller curves or scalloplings which frequently serrat or indented the outline of the arch itself, and from which, no more than that forforesaid symbol, it may be inferred that the Moors, who had often to adopt Gothic architecture, though certainly not out of respect to the symbol of Islamism.* To the crescent or horse-shoe arch, again, we should point as having directly suggested the crescent or bulbous dome, so characteristic a form of that feature in Mohammedan architecture. The outline or section of the latter agrees so strikingly with the curvature of the other (the one being constructed at its base, the other at its span), that we can hardly suppose it to have been a mere accident of coinidence, especially as it is hardly to be supposed that the Moors would otherwise than by some intention of the kind; and more particularly if the dome of Santa Sophia is to be received as the prototype for such feature in Mohammedan architecture. The same is the case in its being almost uniformly united with the arch to exhibit a singular degree of intention and consistency, although they cannot be said to be perfectly architectonic, or to have been dictated by constructive principles. It is true the bulbous dome does not exactly belong to Moorish architecture, but rather to the latter description, still we may be excused for referring to it in our estimate of the style generally; and we may further remark, that domes of such shape bear some analogy to that of the Oriental tur ban, which form of head-dress may possibly in some degree have led to a taste in favour of a similar-shaped covering for the head or head to a mosque or other building: and we may observe that the term Glav, or head, is employed by the Russians in the meaning of a dome or cupola.

Although the horse-shoe arch is a peculiarity, by no means however is it a constant feature in the style, or employed to the exclusion of other forms of arches; on the contrary, there are several varieties, comprising the pointed horse shoe, and others, as is shown in the annexed figures.

* Whether the pointed arch was actually borrowed from Sarazenic architecture or not, it was certainly practised in that style long before our European Gothic age. It was common in the Mohammedan structures of Cairo in the tenth century; and Herasme refers to the Mosque T fulfil erected by Alphonso I at Seville, in 857, 860, as the earliest instance of it who date can be ascertained upon with certainty.
on columns, the other without columns; besides which it illustrates other variations; for on the side B the head of the arch is closed over a square-headed aperture not wider than the span or chord; whereas on the side A the opening between the columns is as wide as the diameter of the arch itself in its greatest width through the centre c.

Fig. 2.

Fig. 2 is an instance of a pointed crescent arch, it being struck from two centres, which, as in the other case, are elevated above the line of the impost, or spring, from which the curve commences. This figure also exhibits two varieties of decorations, both of them by scalloping; one half being scalloped on the intrados or edge of the arch itself; and in the other, the extrados, or outer circumference, being so cut, or more properly speaking, the edge of the face of the wall within which the arch recedes; of which kind is the gate in what is called the Casa del Carbon at Granada.

The next example is of what may be called the cusped or scalloped arch, strictly so termed, the outline being produced by intersecting semicircles, similar to the trefoil-headed compartments in our Gothic windows; but beyond that general resemblance, which certainly goes far to confirm the opinion that the Gothic style borrowed something from the Saracenic, the character is altogether different, not only because it is here the whole arch which is so shaped, instead of merely a subdivision within a larger opening, but also both on account of the external moulding following the same form, and of quite a different mode of decoration. In Gothic architecture the spandrels, or triangular spaces between the foils, are panelled with spayed surfaces uniting in the centre. Arches of the kind here shown occur in the sanctuary of the great mosque at Cordova, where they rest upon columns which both in their capitals and shafts bear considerable similarity to Corinthian ones, except that they are shorter and without bases, and are therefore very different from the slender pillars peculiar to Arabian architecture.

specimens, it being circular-headed, and stilled, that is to say considerably more than a semicircle, its height in fact almost equal to its breadth, but, instead of contracting downwards, like the horse-shoe form, it is continued dead straight to the impost, whereby the arch or semicircle has the appearance of being raised or stilled, and made higher than the arch itself would otherwise be. It also exhibits another peculiarity which the Arabs seem greatly to have affected, namely, corbeling, or resting arches upon brackets which serve as their supports; owing to which such arches have the appearance of being suspended over the opening below, which becomes wider and the support or pillar slenderer in proportion to the projection given to the corbels.

The above will suffice to show the principal varieties of which we have chiefly attended to the form of the arches themselves, without attempting to show detail and decoration, to which it would be impossible to do any sort of justice upon so contracted a scale, although it may serve for mere illustration. As supplementary however to what has been said, it should be observed as one characteristic of the style that whatever their shape, or however applied, arches are generally placed within a square-headed panel or compartment, variously ornamented, and frequently surrounded with a margin or border similar to the square label in Gothic architecture (see Gothic Architecture, page 326, etc.), in instance of a highly enriched compartment in which the arch is set. Sometimes there are two margins or labels
and the space between them is filled up either with inscriptions or other decoration. This mode however was confined to large arches, not supported upon columns, but forming an opening through a wall, for a gate or door; and it was for such purposes that the crescent arch was chiefly used, particularly for entrances to mosques. These were further distinguished by the breadth and richness of the archivolt or the larger surrounding the arch; and which was sometimes equal to the radius or diameter of the arch, and on other occasions the whole archivolt was uniformly decorated; in others only at intervals, or on the alternate vousoirs or arch-stones, some idea of which may be obtained from B, fig. 5.

Pillars are in general of exceedingly slender proportions, almost to apparent insecurity, and certainly by far too much so to satisfy those who acknowledge no other standard of beauty than classical architecture. Yet the lightness thus produced is much of it to have been concealed, and the style of embroidery, it degenerates into fineness; whereas in the Moorish or Arabian style the lightness of particular forms tends to manifest itself in foliage and flowers, wherein such mixture occurs, imagined that this element of slenderness in regard to pillars indicates a tent origin of the style; and that while the pillars themselves were fashioned in imitation of the poles which supported the awning, they are the latter adorned with a degree of beauty such as is given by various devices in mosaic work, and painted stucco, or glazed tiles, which gave to the whole the semblance of being covered with richly-patterned carpeting or embroidered tapestry; not indeed in exact imitation or so as to aim at illusion, but with just that degree of adulation of the type which is observable in all artist-like architectural decoration. This tent-like character was further kept up by此文收录医术解药等, and also various other subjects, such as the scientific and literary aspects related to ancient civilizations and their art forms. The text discusses the influence of Islamic architecture on European art, particularly the Moorish and Arabian styles, and how these styles have been adapted to create unique designs, such as the intricate patterns and motifs found in Islamic art. The text also highlights the use of color and ornamentation in Islamic architecture, emphasizing the diversity and richness of the decorative elements. The text concludes by noting the lasting impact of Islamic art on European culture, particularly in the fields of architecture and design. Overall, the text provides a comprehensive overview of Islamic art and its influence on European art, offering insights into the cultural exchange between the two regions.
Moorish architecture within the Spanish peninsula. Externally they are rather plain than at all remarkable for richness: even the Alhambra itself, gorgeous as it is in its courts and halls, bears on its outside less the character of a palace than of a fortress composed of irregular masses of building and square towers of various dimensions, forming an arrangement which, in its immemorial character and impressiveness, is certain and solidity likewise distinguish the mosque at Cordova, which belongs to the earlier epoch of the style, it having been erected in the first century after the Moors had established themselves in the Peninsula. A second and more important was the mezquita, the most prominent feature, a mosque of 620 feet from north to south, including a spacious court at its north end or side. The interior presents almost a forest of jasper and other marble columns, upwards of six hundred in number, this and dividing the plan into six by twelve sections in one direction (350 feet in length), and thirty-five in the other. In that division of the building appropriated to the imams and chiefs was the great kibba, or sanctuary (in which the Koran was deposited), an octagon covered with a dome standing on a massive octagonal block of stone, and containing the mihrab, the mihrab, or khalif's seat. After the conquest of the city in 1236, by San Ferdinand, this mosque was converted into a cathedral, in consequence of which the character of the interior has been greatly injured by the erection of a Gothic choir in its center. As a splendid work of a later epoch of the style, Cordova could once boast of the palace called the Alzahra, erected about the middle of the tenth century by the celebrated Abd-el-rhaman III, the eighth Iznasah sovereign of Spain. Of this edifice, the doors of which are of brass and ivory, and which is still in the city, nothing now remains to attest its former magnificence, except the descriptions given of it by Mohammedan writers, according to which it was adorned with more than a hundred marble pillars and with walls and porches of the same material. The sumptuousness ascribed to the edifice and its fountains and baths might pass for mere Oriental hyperbole, were it not that the evidence still afforded by the Alhambra, and by parts of the Alcazar at Seville, removes the suspicion of exaggeration; or rather, the exuberant beauties revealed to us by the latter structures greatly surpass anything the most florid description can picture to the mind. The Alhambra, the residence of the Moorish kings of Granada, is supposed by some to have been founded by Mohammed Ben Yassin, the first ruler who reigned from 1238 to 1273; according to others, was begun by his successor Mohammed II. (1273-1292), or by Nasser, and completed by Abu-l heijaz in 1348. This highly interesting and important monument of western Arabian architecture comprises several connected edifices, crowned with minarets and surrounded with gardens and pleasure-grounds, provided its spirit be adhered to without regard to economy, where economy becomes a waste of labor and art. MOORS. This name is generally given to the Arabs who subdued Spain at the beginning of the eighth century, and held it until the latter part of the fifteenth. In the chronicles of Spain and France they are designated by the writers of the Middle Ages as having four different divisions; they are called: some Saracen, from Sarakin (Eastern people), Agaremi, or descendants of Agar, and Ismaelites, or sons of Ismael. By more polished writers, like Rodericus Teutansus, and others, they are styled Arabes, being their name in Arabic, though not appropriate, is that of Moors (inart), owing to their having come from that part of Africa known to the Romans by the name of Mauritania. Thirty-five years after the death of their prophet, the Arabians, after conquering the fertile regions of Asia, invaded the vast continent of Africa. The deserts of Barca and Marmarica, once so formidable to the Roman legions, were completely overruled; Carthage, still the proud capital of Africa, was levelled with the dust, and after forty years of imprisonment and sanguinary warfare, the conquest of the other part of Africa, from the Pillars of Hercules to the farthest limits of Sudan, received the laws of the Arabian conquerors. [BERER.] Far from being satisfied with the possession of so many kingdoms, the military ardor of the Arabs seems to be no way affected by their success, for no sooner were they firmly established in Africa than they invaded and subdued Spain. The immediate causes and most of the incidents of that memorable invasion, as well of the Arabs as of the very heart of Europe, are involved in fabulous obscurity. The chronicles of that country point out, it is true, an incensed nobleman named Julian, who is said to have secretly invited the Arabs to invade the country; but this account, which is the only one in the ancient history of the events, is altogether inconsistent with truth. The geographical position of the peninsula, its genial climate and reputed wealth, the necessity of giving employment to the idle tribes of Berbers who were daily flocking to the standard of the Arabian general, the spirit of discord reigning in the Gothic monarchy, and the professed assistance of the Jews, who, under the reign of Roderic's predecessors, had been subjected to the most cruel treatment, are no doubt among the causes which led to that striking event. On the arrival of the Moors, in A.D. 711, a.d. 711, Takkir, a freedman of Musa Ibn Nusayr, the Arabian viceroys of Africa, landed with a small band of followers at the foot of the rock Calpe, where they determined to found a new capital. After three months, two months after his disembarkation the memorable battle was fought on the banks of the Guadalete, which put an end to the Gothic empire of Spain. Cordova, Granada, Jerez, Malaga, Toledo, then the capital of Spain, were either speedily reduced or opened their gates to the conquerors, and before Musa, who was now hastening from Africa at the head of considerable forces, could land at Algesiras, his lieutenant, Takkir, was the master of the wealthiest cities and the most extensive provinces in the peninsula. On the arrival of Musa the whole country, with the exception being the mountainous region of Andalusia, was subdued with that rapidity which characterized Arabian conquest. 1st Period. A.D. 711-735.—GOVERNORS OF MUSLIM SPAIN.—During the first forty-six years after the conquest of Cordova in 711, the country was governed by several governors appointed by the viceroys of Africa, and not infrequently raised to command by the voice of the people or the army. Their number was twenty-one, including Takkir, the first instrument of the conquest, and master Musa, who, on his arrival at Cordova, had assumed the supreme command, and the duration of the government was forty-six years. Their names and chronology are as follows:—

Abd-al-ara, son of Abu, who, on his father's departure for Damascus, whether he was summoned in 714 to receive the charges brought against him, remained entrusted with the command, followed up the conquests made by his father. He subdued Lusitania, invaded Navarre, and founded the Arabian empire of Spain. After a governor
ment of nearly two years (716), he was assassinated by the orders of the khaliif Suleyman, while performing morning prayers in the mosque of Seville, then the seat of Arab government.

Ayub Ibn Habib Al-lakkami, one of the officers appointed by the khaliif with the execution of his sentences, adminis-
tered the affairs of the country for six months, until the arrival of the governor Al-haur Ibn Abd-al-rahman, a.d. 717.

Al-haur made a successful incursion into Gothic Gaul (718), and gained considerable spoil; but his severity and his tyrannical exactions, which fell alike on the natives and on the Arabs, excited great discontent against him. The complaints of the people reached the court of Damascus, and he was deposed at the end of 718.

As-samh Ibn Malik was the next general appointed to govern Spain. Under his command the Moslems penetr-
ted once more into Gothic Gaul, took Caracassone and Narbonne, and were on the point of reducing the important city of Toulouse, but the weather prevented their further efforts, under its wards they obliged them to return to the Pyrenees. This memorable battle, in which the Arabian governor himself and thousands of his bravest warriors fell, took place in May, 721.

Abnabah Ibn Sohain Al-kolbi, his successor in command, advanced into Spain with great success, and during which he made some trifling incursions into Gaul. On his return from one of these expeditions (in May, 722), he died a natural death.

Hodheyhah Ibn Abdallah governed Spain until the ar-

riendship of the Galicians, who were now again at war with the Moors, he had recourse to the revenues of the largest Mohammedan army which had yet trodden the plains of the Con-
tinent, and penetrated as far as Tours, where he met by Charles Martel. The issue of the contest is well known; the Moslems were defeated after a most bloody engage-

ment, and the Emperor, after the dispersion of his general and his bravest soldiers remained on the field of battle, and the victorious progress of the Arabs was once more stopped in the heart of France (733).

Of the succeeding governors of Mohammedan Spain, viz. Abd-al-rahman Ibn al-Walid, who arrived from Africa and held the reins of government for three years, until he was de-

posed; Obkab Ibn Al-hejaj, who kept it until 741; Balikh Ibn Bisher, Thelahab, Husan Ibn Dheir, and Thueban, little is known except that through their private and public misdeeds he kindled among the Arabians, and that their Spanish empire was brought more than once upon the very brink of ruin.

Yusuf Ibn Feifi was the last governor who ruled over Spain in the name of the caliph after the destruction of the army in 729, his appointment was confirmed at Damascus; he administered the government for nearly ten years, during which Mohammedan Spain continued to be a prey to civil war. Yusuf had to contend with Samir, Almudayn and Al-mansur, the three most formidable powers in Spain. A descendant of that family, Abd-al-rahman Ibn Muaqiyah, escaped from the general massacre of the Beni Umayyah in 745, and, after wandering for some time in Egypt and Barbary, landed on the coast of Spain in the early part of 755. He was received with open arms by the inhabitants, who detested the yoke of the Abbasides, and after defeating in two pitched battles (May and September, 756) the generals of the khaliif, he made his triumphant entry into Cordova, in December, 756. Spain now ceased to be a dependent of the Eastern khaliifs and he was continued to be governed by the posteriority of Abd-al-rahman, who received the surname of Ad-dakil, or the Conqueror. His reign was long and prosperous. The Christians, profiting by the civil dissensions of the Arabs, had extended their territories, but their progress was now again arrested by the rapid advance of the Moors. Cordova, the capital, was enlarged and embellished by Abd-al-rahman, who surrounded it with walls and conveyed water to it. He began the building of the great mosque [Cordova]. and formed ship-yards along the coast; he is moreover said to have been the first to transplant the palm and the pomegranate into the congelial climate of Spain; and he encouraged science and literature in his states. This great king died on the 29th of September, 798, after a reign of thirty-four years and one month.

Hisham, surnamed Arr-iradhi (the benevolent), the youngest of Abd-al-rahman's twenty male children, suc-

cceeded to the empire by his father's appointment. His reign, although prosperous, was of short duration. He had to contend with an insurrection of the Christians, who, under the leadership of Sanche, King of Castile, who, considering themselves injured by their father's will, tried to enforce their claims by arms; but, being defeated in every encounter, they were soon compelled to make their submission. In his expeditions against the Christians, Al-hakam was equally successful. He captured the town of Jaca, and, after a short siege, captured the town of Urgell, a.d. 796. Upon the death of his father, he assumed the government of his dominions, and continued the struggle against the Christians until 961. (Candia.) After this signal act of tyranny Al-hakam received the surname of Rabladi (the of the suburb). He died in May, 822.

Abd-al-rahman II., surnamed Al-usatt (the middle one), succeeded his father Al-hakam. He had at first to contend against his great-uncle Abdallah, who, leaving his place of confinement in Africa, again tried the fortune of war in Spain. He was however defeated. In his transactions with the Christians, Abd-al-rahman was still more fortunate than either of his two predecessors. Barcelona was retaken from the Franks in 787; a Mohammedan fleet burned the suburbs of Marseille in 839; and he fought with success against the Sevillian viking, who, in 843-4, appeared for the first time on the coasts of his dominions. His government was also justly commended. He erected works of public utility; mosques and colleges were built, roads made, and canals dug for the benefit of agriculture; he was likewise an enthusiastic lover of science and literature, which he encouraged liberally. He was a pious man, and his successor, Abd-al-ra-

mon died, universally regretted, in August, 852.

He was succeeded by his son Mohammed I., whose reign was anything but glorious. At war with his own subjects, he was unable to stop the progress of the Christians, who, under Alphonso III., began to make successful inroads into the very heart of the Moslem dominions. To his hereditary states of Galicia and Asturias that enterprising monarch added the rest of Leon, Old Castile, Estremadura, and a considerable portion of Lusitania. To these military disas-
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tors must be added a drought of one year's duration (867), which terminated in a pestilence, an earthquake which swallowed up several towns (881), and another pestilential invasion of the Northerners. His reign lasted 24 years and 11 months. Mohammed died in July, 856, at the age of 65.

His son and successor Al-Mundhur, being unable to contend with Kalib, a daring rebel, who in his father's time had thrown off the independence of Toledo and the neighboring districts, was defeated and slain, after a reign of one year and eleven months, in July, 888.

Abdallah, his brother and successor, had not only to contend against Kalib, but also against the lançar (lord of the throne), who had put his own sons Mohammad and Kásim at the head of his forces. The former he defeated in a pitched battle near Calatrava, in 889. With the latter he was equally successful; after a short campaign he defeated (892) the forces of the two princes, both of whom fell into his hands. Mohammad, the eldest, was confined in a dungeon and strangled by his orders; Kásim was spared. Abdallah died in October, 912, after a reign of 25 years, appointing for his successor his grandson Abd-el-Rahman III., the son of Mohammed.

Abd-el-Rahman III., surnamed An-Nasir lid-illah (the defender of the faith of God), may safely be pronounced the greatest monarch that the Spanish Arabs ever knew. While still young, the mildness of his temper, his generosity, and his love of learning had made him the favorite of the people; and so that no one could ever have been in every respect fit for the management of public affairs, his appointment was received by the nation with unanimous joy. Abd-el-Rahman's first care was to purify the country from the rebels, who under pretense of censorship, sat in the most distant parts of the Peninsula. Of these the most powerful was Kalib, who, assisted by the Christians, extended his sway over the whole portion of Mohammedan Spain; he was pursued from fortress to fortress, his army disorganized, and dispersed, and himself obliged to wander in disguise through the mountains of Aragon, where he met with an obscure death; and although his two sons Suleymán and Jafar attempted some time afterwards to revive the war, their plans were completely defeated, and Toledo and other cities, which were still attached to his cause, were obliged to capitulate (914).

In his expeditions against the Christians, Abd-el-Rahman was equally successful. In 935 he gained a signal victory over Ramiro II., king of Leon, and in 940 he defeated, near St. Étienne, the Gallican church, whom he commanded his forces in person. His wars with Ordoño II., king of Leon, had the same happy termination. His estates too were considerably increased by the addition of a large portion of Morocco, the country of Fez, its capital, which he wrested from the hands of the Ifritides.

Elated by so much success, Abd-el-Rahman shook off the yoke which, in religious matters at least, still bound Spain to the East, and assuming the titles of Al-Árak al-munimn (calif of the faithful), Khalif al-munim, began to give his unreserved attention to the extension and embellishment of his capital, and to promote the welfare of his subjects. His additions to the great mosque of Cordova, the foundation of the town and palace of Azahra, the enlargement of several palaces and schools, the formation of an extensive library within his palace, the construction of roads, canals, and aqueducts, all attest his taste for luxury, his love of the arts, and his unceasing activity.

The justice of this sovereign the Mohammedan writers have never failed to point out. One of his first acts was to redress the wrongs committed by his son Al-hakem to succeed him in the empire, his youngest son Abdallah presented the nomination, and entered into a conspiracy to deprive the favoured brother of his life. The plot was discovered, and Abdallah was arrested, and, notwithstanding the entreaties of his intended victim, condemned to death and executed (950). After a prosperous reign of upwards of 50 years, Abd-el-Rahman died, on the 16th October, 961, in the 73rd year of his age.

His successor was filled by Abd-al-Rahman II., surnamed Al-Mustansir bailah (he who seeks for the help of God), and who to the many brilliant qualities of his father united an unbounded love for literature. Al-hakem's reign was one of comparative tranquillity; little or no war was waged against the Christians, and the faculty of science was protected rather than increased by conquest, so that his whole attention was directed to the promotion of science in his states. His reign indeed has been not inappropriately ciliated "the golden age of Arabian literature in Spain." He founded schools, endowed colleges, and showed boundless liberality and benevolence to the Welfare of every class. He formed at Cordova a public library called 'the Library of Merwan,' the unfinished catalogue of which is said by the Arabian writers to have filled forty-four folio volumes.

He died September 10, 967, after a reign of upwards of 15 years, leaving for his successor his son Hishâm, who was then under eleven years of age.

On the accession of the youthful Hishâm II., surnamed Aiumayyad bilelah (he who is protected by God), to the throne, the Christians were filled with joy. Abd-al-Rahman, who had been his father's vizir, succeeded in gaining the affection of his sovereign and ruling in his name. He consoled Hishâm to the serglio, and taking into his hands the administration of the kingdom, he assumed all the insignia of royalty. Indeed much of the Arabic authors' authority in the case of this monarch is attributed to call Al-Mustansir a usurper, and to number him among the kings of Cordova. But if his ambition was great, his talents made him equal to the task: he was brave, generous, and just; and his wars with the Christians show that he was gifted with great military talents. During his reign he had not to direct no less than seven and twenty expeditions into the very heart of the Christian dominions, which he seems to have entertained the idea of reducing entirely to the sway of Islam. In 983 he took the important fortress of Gormus, and destroyed the monastery of Mirál; in 991 he razed Coimbra, and in 997 he stormed and burnt the city of Leon, the capital of the Spanish monarchy; he went even as far as Santiago, which he took in 993, and possessed the same throne of the shrine of Compostella, the bells of which he sent to Cordova to be cast into lamps for the great mosque.

In Africa too Al-Mansur considerably extended the limits of his empire. The six and twenty years of his administration, more than the name of the most brilliant pages in the history of Mohammedan Spain. Al-Mansur died in August, 1001, on his return from an unsuccessful expedition, the only reverse during his long career of triumph, some say from grief, others from wounds received in battle, leaving the throne in the hands of his eldest son Abd-el-malek, who still kept his sovereign in confinement, and ruled as absolutely as his father. But Abd-el-malek did not possess the brilliant qualities of Al-mansur; in his expeditions against the Christians he was generally unsuccessful, and his internal administration was not good. He died in 1008, in Cordova, probably from the effects of poison, after administering the affairs of the Khalifate for six years and four months.

He was succeeded in command by his brother Abd-el-Rahman, who was succeeding in the favorite of the people, but his brother, assumed all the power, while Hishâm led a proscribed life within the walls of the seraglio. But not satisfied with what he had obtained, the ambitious minister aimed at royal power. He prevailed upon Hishâm, who was childless, to name him his successor; but he so warped his mind with his own, that, for Mohammed, a prince of the blood, repaired with the frontiers, assembled an army, invested Cordova, and Abd-el-malek having been deserted by his followers, was taken prisoner, and crucified by the victor's orders, on the 17th of January, 1009.

The apparent motives of Mohammed's rebellion seemed to be to release his sovereign from the dependence and slavery in which he had been held by the sons of Al-mansur; but no one knows precisely whether it was not only to get rid of the son of Hishâm, who kept him in state of confinement, was dead, he caused himself to be proclaimed in his stead, and assumed the titles of Khalil and Medin billah (the director of God). Mohammed did not long reign; being murdered by an emissary of his, he had soon recovered his former adversary, Suleymán, also a member of the royal family, who, at the head of the Afdar guard, took the field against him, defeated his troops, and gained momentary possession of the capital in 1019; and although Mohamed returned Cordova a few months afterwards, he was afterwards victor of the populace, who tore him to pieces, and set his head to the camp of his rival (Aug. 1010).

Suleymán, surnamed Almudainal bailah (he who implies God) afterwards administered the affairs of Mothammedan Spain in Hishâm's name, although Moslems believed that Hishâm was secretly put to death by his orders. But the
power of the Umayyad dynasty, and indeed of the Moham-
medan empire of Spain, was fast decaying. The govern-
or of the provinces, refusing to acknowledge the author-
ity of a caliph whom he distrusted, declared war, and a
war of resistance ensued, the Umayyads being
forced to submit and accept the authority of the Caliph of
Bagdad. In the course of this struggle, the Caliph
Muhammad ibn Harun ibn Abd al-Malik, who had been
enraged by the refusal of the new dynasty to submit,
was defeated and killed at the battle of the Almansor,
where he was killed in battle.

With the death of the Caliphate of Cordova, the ambition
of the nobility of the Umayyads was at an end, and the
power of the Moors in Spain declined.

**Third period:** 1022-1238. *Independent Kingdoms.*—With
the fall of the Caliphate, the power of the Moors in
Spain declined, and the missions of the Recon-
quista were successful. The Moors were driven from
the peninsula, and the Moors were forced to accept the
crown of the Christian kings.

**Empire of the Almoravides:** 1099-1146.—Towards the
middle of the eleventh century, two men, named Yahya ibn
Ibrahim and Abdallah ibn Yasin, made their way to
Morocco, where they were received as religious leaders
and their disciples were not only allowed to spread their
religion, but were also encouraged to form a military
organization. The Moroccans were eager to participate in
this new movement, and the Almoravides soon became
the dominant force in the peninsula, driving the Moors
from their strongholds and establishing themselves as
masters of the land.

**Empire of the Almohades:** 1122-1269.—The Almohades
were a group of Berber tribes who had formed a
congregation under the leadership of Muhammad ibn
Abd al-Wahhab, who had been expelled from Spain by the
Almoravides. The Almohades were able to establish a
stronghold on Mount Atlas, and soon spread throughout
the length and breadth of Africa. By making their followers
believe that he was the twelfth imam of the race of Ali, and the
Meheri, or director, who was to teach mankind the path of salvation,
and cause the truth to flourish, the Almohades were able to
spread their religion and gain control of the peninsula.

**Cousin Yusuf ibn Tashfin:** 1134-1184.—Yusuf ibn Tashfin
was the last of the Almohades, and he continued the
work of his predecessors in spreading the faith and
establishing the empire of the Almohades.

**Summary:** The Moors in Spain were subjected to the
decline of the Caliphate of Cordova, and their power in
the peninsula declined. The Reconquista was successful,
and the Moors were forced to accept the crown of the
Christian kings. The Almoravides and the Almohades
were able to establish themselves as masters of the
peninsula, and the Moors were driven from their
strongholds.

**The Reconquista:** The Reconquista was a series of
conquests by the Christian kingdoms of the Iberian
Peninsula, which lasted from the 10th to the 13th
century. The Reconquista began with the treaty of
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1144), occasioned by wounds received in an engagement near Santarem in Portugal.

Abd Yusuf Yakub, better known by the surname of Almanzor, landed at Algeciras, and defeated Alphonso III of Castile in the plains of Alcarace. He then marched against Toledo, the capital, and although he could not reduce it, he took Alcalá, Utrera, Guadalajara, Grandada, and all the surrounding territory. Yusuf died in January or August, 1149, leaving behind him the character of an able, brave, and magnanimous prince.

Mohammed Ibn Abdallah, surnamed Annisirris lidinilah (the defender of the religion of God), was the next prince of the race of the Almohades who occupied the throne of Mohammedan Spain, which was every day being reduced to narrower limits. No sooner was Mohammed on the throne than he undertook a last effort to regain the possession of Southern Spain, which had been lost by his ancestors. In May, 1121, he crossed the strait with an army, the largest perhaps that Africa ever poured on the shores of Spain (for we are told that it amounted to several hundred thousand men), and encamped on the summit of that montainous chain which divides New Castile from Andalusia. He was met by the combined forces of the Christian princes and thousands of foreign volunteers, whom a crusade proclaimed by the Pope Innocent III. brought to their help. The Christians, though at first successful, were defeated with dreadful carnage, and the battle of Las Navas may be considered as one which in its immediate consequences involved the ruin of the Mohammedan empire in Spain. Mohammed died in Morocco, in July, 1213, not without subsequent troubles.

The reign of Yusuf II, surnamed Abd Yakub, who was only eleven years of age on the death of his father, was a scene of continued troubles. He died without issue, in January, 1224. His successor, Abul-makul Abd-el-wabid, lost both life and empire in the strait against the Almoravides (1224), and the heads of Abdalhussayn Mohammed surnamed Al-adel, who himself was strangled in October, 1227.

Almanzor Ali was not more fortunate. He had to contend in Africa against his relative Yahya, who disputed the crown of the haouar and Spain against the chieflain, Ibn Hûd by name, who had himself proclaimed king of Mohammedan Spain, and ultimately succeeded in wresting that country from the Almohades. Almanzor died in 1222.

The power of the Almohades was now fast declining. Mohammed, the successor of Almanzor, strove in vain to re-establish his supremacy in Spain: he was obliged to quit that country, and leave it in the hands of his adversaries, who formed the haouar in Valencia, and the Almoravides in Valencia and the surrounding country; Ibn Hûd was obeyed in Aragon and part of Andalusia; and Mohammed Ibn Alahmar ruled despotically over Jaen and the best part of the province of Granada. Occasionally at war with each other, the three monarchies could not maintain their pretensions on the ground of their own supremacy in the country. Cordova, the proud capital of the Mohammedan empire, surrendered to the victors in June, 1236; Valencia capitulated in September, 1238; Donia in May, 1244; and during the year 1246 all the fortresses on both banks of the Guadalquivir, from Jaen to the gates of Seville, fell into the hands of the Christians.

Mohammed Ibn Alahmar, king of Granada, became the vassal of Ferdinand III, who in 1248, assisted by his powerful ally, wrested from the Moors the important city of Seville.

Fourth Period. 1238-1492. Kingdom of Granada. — By becoming the vassal of Ferdinand, the new king of Granada, Mohammed Ibn Alahmar made his dynasty as long as Ferdinand lived. However, on the death of Alphonso X, surnamed the learned, who succeeded his father in the throne of Castile, a desultory warfare was prosecuted on both sides, which ended in a truce in 1266. Ibn Alahmar died in January, 1273.

He was succeeded by his son, Mohammed II, under whose reign another attempt was made by the Africans to re-establish the in the heart of Spain the supremacy of Islam. In 1273 Ibn Yusuf, surnamed Alhazan, crossed the straits at the head of considerable forces, and at first gained some advantages; but he was soon compelled to retire to his own dominions. Mohammed, king of Granada, likewise attempted to regain part of the territories lost by his father; but after a reign of twenty-nine years spent in continual war with the Christians, he died without accomplishing his object, in 1302.

Mohammed III, surnamed Abd Abdalla, his son and successor, was an unfortunate monarch. He had not only to contend against his own subjects, who revolted at Granada and Almeria, but to defend the interests of the Christians, who, in 1308, snatched from him the important fortress of Gibraltar. On his return to Granada, after an unsuccessful attempt to relieve Almeria, which the king of Granada had invested (1309), he was the victim of a popular commotion, and obliged to resign his throne to his brother Nasser.

The commencement of Nasser's reign was propitious. The siege of Almeria was raised; and Ceuta, which had been since 1249 the most important entrepôt of Mohammedan commerce, was recaptured. The keys of the straits since the Christians held Gibraltar, was regained by his generals. But the same incessant mob which had raised him to power, now decreed his deposition. In 1314 the people of Granada rose and forced him to flee to Almeria. After a few weeks, however, he was again against them, but, having been defeated and besieged in his palace, he was obliged to resign and retire into private life.

Ismael Ibn Faraj, surnamed Abd el-Walid, a prince of the royal blood, showed great abilities both as a warrior and as a statesman. In 1321, he succeeded his father in the throne of Granada. He at once took Gibraltar, he gained (1319) a most signal victory over the Christians commanded by Pedro, Infante of Castile, and his uncle John, both of whom remained dead on the field of battle. Martos and Baza were taken in 1322, and the castilean and moriscos were conquered. The people of Granada, however, revolted against him, and he was assailed by a body of assassins, headed by Mohammed in person, and both king and minister fell under the poniards of the conspirators, in 1325.

After the death of Ismael, his son Mohammed IV. was unanimously elected to the throne of Granada. The commencement of his reign was unpropitious. Othman, the captain of his guards, revolted, and proclaimed Mohammed Ibn Faraj. The Castilians (1329) seized on Vera, Oliena, Ayamonte, and other fortresses; and the king going out in person to stop their progress, he was defeated, and his army dispersed. The rebel Othman, who belonged to the royal family of Fez, having obtained reinforcements from Africa, took Algeciras, Marbella, and Ronda. But towards the end of his reign he was forced to retire to the fortress of Almeria, where he was assassinated by his contemporaries. In 1337, Mohammed took back his possessions, and was proclaimed king of Granada; and the Castilians were compelled to retire. In 1338 he retook the important city of Baena, recovered Gibraltar in 1330, and succeeded in reducing all the rebel governors to obedience. However, as he was prepar- ing to cross over to Africa on a visit to Abu-l-hassan, king of the Moors, he was murdered at Seville, and his corpse was thrown into the river Guadalquivir. The last reign of the Moors, extending from 1325 to 1492, was a period of disorders, worse than any which preceded it. During their last days they seem to have given his unreserved attention to the reform of the administration of justice, to the encouragement of mechanical and other useful arts, and to the promotion of the general welfare. During his reign the Africans under his protection were perceived to attempt to plant the banners of Islamism in the centre of Spain. They were met on the banks of the river Salado near Tarifa by the Castilians and Portuguese (Oct. 1346). The Africans were cut to pieces with immense loss, and the Moorish king's wives, and their daughters, were given in prize of the victors. The loss of Algeciras in 1343, and that of many important towns in 1344, followed this most signal victory, and the limits of the kingdom of Granada were thus considerably narrowed. Like most of his predecessors, Yusuf fell by an assassin. In the month of December, 1492, he was stabbed while at prayers in the mosque by a madman.

Mohammed V., the eldest son of Yusuf, inherited the virtues and the abilities of his father. Like all the others with the Christians, he gave his entire attention to prosperity and welfare of his subjects, but rebellion, as usual, came to thwart his good design. Some dereve...
tented chiefains, whom the severity of his judgments had displeased, turned their eyes to his brother Ismail, and in the year 1329 attacked Mohammed's palace, massacred the guards, and rushed into the royal apartments. Finding his victim gone, they tumultuously proclaimed Ismail their leader.

Ismail II did not reign long. Scarcely had he occupied the throne for one year, when he himself fell a victim to the same misfortunes which had brought about the death of the unfortunate king. The assassin was a Moor, who had assisted in raising him to the throne, but who now besieged him in the Alhambra, made him prisoner in a sally, and had him put to death in July, 1360.

The usurper Abd el-Salam did not long enjoy the fruit of his treachery. He was dismissed with Pedro, as the Cruel, king of Castile, and with the dethroned monarch Mohammed V., whose authority was still acknowledged at Ronda and the neighbouring districts, and seeing that he could not well retain his enemies, he resolved to do homage to the crown of Castile, and to hold his kingdom thereupon as an hereditary fief. Having obtained a safe conduct, he repaired to Seville with a small escort, and presented himself before the Castilian king. But either the wishes or the reproaches which the latter had with him even after presenting him considerable portion to Pedro, awoke the avarice of that prince, or, what is more probable, Pedro was in secret intelligence with Abd el-Sala's rival: the fact is, that, in violation of the rules of hospitality, the unfortunate monarch was put to death.

By the death of the usurper, the throne of Granada devolved upon the legitimate sovereign. The remainder of Mohammed's life was troubled only by one unimportant revolt, which was speedily repressed. He took Algeciras in 1364, but drawing no benefit from it. In 1369, Yusuf II., surnamed Abú Abdallâh, succeeded to his father. Scarcely however was he seated on the throne, when he narrowly escaped falling a victim to the rebellion of his brother. Mohammed, who, enchanted by the father of his field-friend to the Christians, had succeeded in forming a powerful party. The sedition having been appeased, Yusuf invaded Murcia (1391), but without much success. He was more fortunate in 1394, when the grand-master of Alcántara, who had been taken to Spain by the Castilians with a body of cavalry, was cut to pieces with his men, and himself slain. Yusuf died in 1395, with symptoms of poison.

No sooner had Yusuf expired, than Mohammed VI., the same son who had conspired against him, seized on the vacant throne. He governed the kingdom with comparative tranquility, and for a period of 14 years, during which peace was only interrupted once, in 1416, when the Christians under the Infante Don Fernando took possession of Antequera. Yusuf died in 1424.

In 1426, when Abd el-Aziz, or the left-handed, succeeded his father Yusuf. His first care after taking the reins of government was to renew the truce with the Christians, a circumstance which, united to his haughty and overbearing temper, made him exceedingly unpopular with his subjects. The demands he made on the Christians for public amusements, he became so obdurate, that an insurrection broke out at Granada, his palace was invested and forced, and he had to escape to the court of his kinsman, the sultan of Tunis, in 1428.

The vacant throne was filled by Mohammed VIII. At the head of an army furnished him by the king of Tunis the dethroned monarch appeared the ensuing year in Andalusia, entered Granada, besieged the usurper in his palace, and belauded the latter's resolves in 1430. He ascended the throne upon his death a second time, for Yusuf Ibin Alahmar, a descendant from the first kings of Granada, made an alliance with John II., king of Castile, and, having defeated the troops of his rival in 1435, marched on Granada, and entered the capital without opposition, while Mohammed fled to Malaga for refreshments. Finding his victim gone, they tumultuously proclaimed Ismail their leader.

Ismail II. did not reign long. Scarcely had he occupied the throne for one year, when he himself fell a victim to the same misfortunes which had brought about the death of the unfortunate king. The assassin was a Moor, who had assisted in raising him to the throne, but who now besieged him in the Alhambra, made him prisoner in a sally, and had him put to death in July, 1360.

The usurper Abd el-Salam did not long enjoy the fruit of his treachery. He was dismissed with Pedro, as the Cruel, king of Castile, and with the dethroned monarch Mohammed V., whose authority was still acknowledged at Ronda and the neighbouring districts, and seeing that he could not well retain his enemies, he resolved to do homage to the crown of Castile, and to hold his kingdom thereupon as an hereditary fief. Having obtained a safe conduct, he repaired to Seville with a small escort, and presented himself before the Castilian king. But either the wishes or the reproaches which the latter had with him even after presenting him considerable portion to Pedro, awoke the avarice of that prince, or, what is more probable, Pedro was in secret intelligence with Abd el-Sala's rival: the fact is, that, in violation of the rules of hospitality, the unfortunate monarch was put to death.

By the death of the usurper, the throne of Granada devolved upon the legitimate sovereign. The remainder of Mohammed's life was troubled only by one unimportant revolt, which was speedily repressed. He took Algeciras in 1364, but drawing no benefit from it. In 1406, the Christians took Gibraltar, and Archidona, and subdued all the intermediate country; the frequent incursions of the borderers also narrowed considerably the limits of the Moorish kingdom, now divided into the provinces of Granada, which was still unsubdued, and the Alhambra, which was reduced to a province. This peace was at last concluded in 1463, on condition that the Moorish king should hold his kingdom as a fief of Castile, and pay an annual tribute of 12,000 pistoles in gold. Mohammed died in 1466.

Muxley Ali Abu-l-Hasan, the eldest son of Mohammed, succeeded him, but the state of affrays grew every day worse. In 1470 the governor of Malaga revolted, and did homage to the king of Castile. Granada, the capital, and even the larem, became the scene of those commotions and discords which hastened the ruin of the Moorish empire. The sultana Ayesha, mother of Abu Abdallah, heir presumptive to the throne, entertained a mortal hatred towards another of the king's wives, a Spanish lady called Zoraya, and mother of two princes. At that time the two powerful states of Castile and Aragon were at enmity, and the Moorish king of Granada was reduced to 12 provinces, and the conquered country was divided into two hostile factions—that of Ayesha and Zoraya, the two wives of Abu-l-Hasan. The tribe of the Tugris (Zugris) supported the former; that of the Beni Serraç (Abenserrages) the latter; one held the Alayzin, the other the Alhambra; and the streets of Granada were stained with the blood of its inhabitants. Although Abu Abdallah succeeded him, he could not subdue the unruly princes, and was himself taken prisoner by the Christians near Lucena, in April, 1463. Abu-l-Hasan regained temporary possession of his capital in 1484, but he was soon disturbed by Abu Abdallah, who, having obtained his liberty again, dispossessed his father.

At last the people of Granada, leaving the father and son to fight their own quarrels, appointed Abdallah, surnamed Zagul, or the brave, to distinguish him from his nephew, called Abu-l-Hasan. But the Moorish king of Granada, meanwhile Ferdinand was pushing on his conquests. In June, 1484, he besieged and took Alora and Setenil, and defeated the Moors in two partial engagements. In 1485, Romula, Marbella, Coin, &c., fell into his hands: Loxa surrendered in 1487, and in 1492 the Moorish kingdom of Granada was reduced to a province.
to put an end to their civil dissensions; and, profiting by the absence of Zagal from his capital, Abu Abdallah As-saghir marched upon Granada and usurped the throne.

This most admirer, who is better known in the Spanish chronicles by the name of Boabdil, was the last king of Granada. In the spring of 1491 Ferdinand invested that capital, and after a siege of nearly a year, the standard of the cross waved on the red towers of the Alhambra. Thus ended, after many adventures, an empire which had lasted for nearly eight centuries.

Government, Institutions, &c.—The government and institutions of the Spanish Arabs may be said, with very few exceptions, to have been modelled upon the Eastern khalifate. The sultan, who was invested with despotic power, possessed entire spiritual as well as temporal supremacy: he administered the government with the advice of his mezwar, or council of state; the office of hajeb, or prime-minister, corresponded in the nature and variety of its functions with that of a Turkish grand-vizier. The provinces were governed by waalis, or military commanders; and the administration of justice, for which there was no other base than the Koran and the traditional decisions of the companions of the Prophet, was placed in the hands of the judge. To the clemency of the sultan, in times of appeal, revoke their sentence. The sultan selected his successors from among his progeny, and not infrequently associated one of his sons in the empire during his lifetime.

But although the principles of government were the same as in the East, and the vices of Mohammedan constitutions as prominent, yet the position of the Spanish Arabs, surrounded as they were by enemies, contributed to give to their character a more wondrous and solemn air than that possessed in the East. The khalifs of Cordova supported a large military force, always ready to take the field, and a numerous fleet to defend the coast of their empire from any maritime invasion. Agriculture and trade were fostered alike by the sultan and the populace; regulation of the population increased at an astonishing rate; and the revenue, which is computed at five millions sterling—an enormous sum for the time—enabled the khalifs of Cordova to surround their throne with a magnificence and splendour unparalleled even in the East.

Sciences; Literature; Arts.—It is now universally acknowledged in Europe that the Arabs succeeded to the sciences of the Greeks; that at a time when ignorance and barbarism prevailed through every part of the Roman Empire, they composed the great majority of the masters and teachers of science; and that by a singular revolution in the history of nations, Europe became indebted to her Mohammedan invaders for the first lessons of science and learning. With what success the cultivation of knowledge was carried on in the East, the readers must already have perceived in various articles of the present work [Arabia; Abdalatif; Atempace; Asia; &c.]; it will now suffice to say, that to the Western Arabs especially, they were clothed, since not only war, love, and satire, but grammar, theology, rhetoric, and even the abstruse sciences often form the subject of their compositions. Their poems consist of idyls, elegies, epigrams, odes, satires, and almost every other species of poetry which we have received from the Greeks and Romans, except epic and dramatic poetry, which they never attempted. Besides these, the Spanish Arabs are considered as the inventors of a sort of idyl called muwaahha (a word meaning in Arabic 'the varied'), from the nature of the composition, which is a narrative of some singular or extraordinary event involving a horse, a flower, or any similar object. The most distinguished among the poets of Mohammedan Spain are, Yabra Ibn Hudheyl and Ahmed Ibn Abd-rabhi, who flourished in the ninth century; Yashia Ibn Al-hakeem Al-ghazali, who wrote a treatise on the art of dressing sheep's plumes; Mustafa Ibn Masa; Abi Tâbih of Aleira, who acquired the honorable surname of Al-mutennabi (the inspired); Ibn Abdin, who wrote 'the History of the Kings of Badajos' in verse: Al-mustamned Ibn Abbas, king of Seville; Almudner, king of Saragossa; and the famous Abu-l-Abid Ibn Bajah, whose poems have lately been translated by Mr. Weyers.

The historians of Mohammedan Spain are equally numerous, but their merits are generally not great. The best of them give us mangled statements of facts, unaccompanied by accurate reflection. Among the most eminent was Abu Bekr Al-râzi, who flourished towards the end of the ninth century; Ibn Hayyan, who wrote a general history of Spain in 60 volumes; Mohammed Al-moobdhabker, king of Badajos, who has a history of his times, equally voluminous; Abi-hamayd, who wrote a biographi- cal history of illustrious Moslems; Ibn Bashkuwal of Cordova; Ibnu-l-Abbâr of Valencia; and the vizier Ibnu-l-Kasubb, who wrote several valuable works on the history of the kings of Andalusia.

But it was in the physical and experimental sciences that the Spanish Moslems most excelled. From the establishment of the Umeyyah dynasty, the greatest attention was paid to the study of mathematics, and all the other exact sciences. Copernicus, for example, was one of the astronomers of Cordova, who died A.D. 1198; Abdelmalek Ibn Zohr (commonly called Alhazen); and the famous Ibn Bajeh, or Avenpace. Their knowledge of botany was considerable, and likewise that of medicine and chemistry, in both which sciences and arts great improvements were made. In mathematics and the sciences dependent on them, they were still more distinguished. A Spanish Arab, a native of Toledo, named Az-zarkal, improved the astrolabe, and invented an instrument for observing the motions of the heavenly bodies, which was long known in Europe by the name of an inventor.

The useful arts of life also engaged the attention of the Arabs. Agriculture, horticulture, and planting were encouraged by their kings; and the canals and other works for introducing the precipitation of rains into the soil of the continents, we owe the preservation of most of the sciences cultivated by the Greeks.

The first conquerors of Spain, like those of the East, were a rude and illiterate people. It was not till the times of Abu-el-râman, the first of the Beni Umeeyah (A.D. 133, A.D. 756), that any attention was paid to the cultivation of letters. That monarch and his successors founded colleges, formed public libraries, encouraged literary pursuits by their example and their liberality, and by their successive edicts established the Arabic sciences where they were engrafted into their states, and continued to flourish to a later period in Spain than in the East. The limits of this sketch prevent us from taking a complete survey of Arabian literature; we shall therefore confine ourselves to the history and genealogy of the favourite studies of the nation, and make a hasty review of those sciences which the Spanish Arabs cultivated with the greatest success.

Poetry has always been the favourite pursuit of Eastern nations, and indeed it was cultivated with ardour which amounted to a passion, and Arabia is said to have produced more poets than all the rest of the world together. The taste was rather increased than abated in Spain, and the catalogues of Casi show to what extent the metrical art had been cultivated there, with various forms of versification. The poetical tales abound with romance, but grammar, theology, rhetoric, and even the abstruse
sluding the capital, was estimated in 1801 at 1,069,672, about two-thirds of whom were Hindus, and the remainder were chiefly Mohammedans.

The most valuable products of the soil are silk and indigo. The manufacture of wooll-silk and textiles, both flowered and plain, and many other varieties of silk goods are made for internal consumption and for exportation. The land revenue, or Jumma, in 1814 amounted to 18,75,000 rupees (187,500L.), and the excise duties realised another lac of rupees (10,000L.).

MOORSHEBADDAD, the capital of the district, and long the nominal capital of Bengal, is situated in 24° 11' N. lat. and 88° 15' E. long., on the Bhagirathi, the most sacred branch of the Ganges, which flows through the windings of the stream. The city was originally called Muckoonabad, which was exchanged for its present name in 1704, when Mooreshed Khody Khan transferred to it the seat of his government from Dacca. It is an open town, and the buildings extend on both sides of the river through eight miles of its course. It is a remarkably ill-built town, presenting a great assemblage of mud and straw huts, placed without any regard to order, and intersected with numerous narrow streets. This distinction of the city, which desires and aversions, consequent upon this perception, are all ultimate facts in our nature; such as the pleasures and pains, or the desires and aversions, of which sweet or bitter tastes, are the expression. This is called the theory of the moral sense, or of moral instinct, or of eternal and immutable morality, or of intuitive principles of morality, or by any other name; to the differences between which those who adopt the theory often attach, with much acuteness and force, consequences which, for our present purpose, may all be considered as synonymous.

The other theory is, that the ideas of right or wrong, and the feelings which attach themselves to those ideas, are not ultimate facts, but may be explained and accounted for—are referable to some law of utility, to which all the others, and in some cases to which all our other complex ideas and feelings depend: that the distinction between moral and immoral acts is not a peculiar and inscrutable property in the acts themselves, which we perceive by a sense, as we perceive colours by our sense of sight; but flows from the ordinary properties of these actions, for the recognition of which we need not other faculty than our intellect and bodily senses. And the particular property in actions which constitutes them moral or immoral, is the same as that which constitutes all actions to which we are inclined to give the name of moral in the sense we have before used. This theory is sometimes called the theory of utility. (London Review, vol. viii., p. 351.)

MORALES, AMBROSIO, a Spanish historian and antiquarian, was born at Cordova, in 1513. His father Antonio was an eminent physician, whom Cardinal Jimenez appointed principal professor of philosophy at Alcala, and to whom the marshal of Provence presented the house to which tradition pointed out as the one that Seneca had inhabited, in order, said the donor, that it might become again the dwelling of the wisest Cordovan. Ambrosio had for his maternal grandfather Fernan Perez de Oliva, who left him a valuable library, and for a more cautious of this name. — 'Imagen del Mundo.' Another Fernan Perez de Oliva, who was Ambrosio's maternal uncle, and a professor of philosophy and theology at Salamanca, took a prominent part in his piety and devotion. He was a most learned man, and to Melchior Cano, two great writers and eloquent professors of divinity of that time, the former at the Alcazar, the latter at Salamanca, where he was the great antagonist of his eminent colleague Bartholomew Carranza, and a still greater antagonist of the Jesuits. This Cano of Canes is the author of the excellent treatise 'De Locis Theologicis,' and was a great reformer of the schools, from which he banished many futile and absurd questions.

While yet a youth, Morales produced a translation of the Pintxas or Table of Cebes. But a religious enthusiasm rose
far above all his literary aspirations, and pervaded all his actions.

At the age of nineteen, Morales became a Jeronimita, when his religious fervour being no longer controllable, in order to secure himself against temptation, he attempted to inseparable from this self-mutilation drew from him a shriek which brought a brother monk to his cell in time to give him the fatal blow. In order to obtain for his conduct, he set out for Rome, but fell into the sea, and was saved, according to his own account, by a miracle. Considering this accident as a warning not to proceed, he joined his friends at court, and lived thenceforward as a student of the law. On the death of his father, he became a professor at Alcalá, where he had, among others, Guevara, Chacon, Sandoval, and the first Don Juan of Austria, among his pupils. He sustained the high literary credit of his family by his investigations into the antiquities of Spain. He began to collect materials in 1541, and to arrange them in 1566. On the death of his friend Florian de Osanco, he obtained the vacant place of royal chronicler; but his first appearance as an author was in defending the historian Zurita. When the inquisitors of Jutus and Pastor were transcribed to Alcalá, Morales was called upon to record that event and the ceremony on the occasion, together with the martyrdom of those saints. On the death of the chronicler Castro, he was sent to inspect his papers, as belonging, in virtue of the king's order, to the Escorial, in order to examine the Codex Albedaensis, which was a collection of council's given to Philip II. by the Conde de Buendia. At the death of the bishop of Plasencia, the collector of MSS. for the Escorial, Morales was sent to collect him in the archives as regards the council's, and he made indices to his fresh acquisitions, such for instance as the Codex Emilianensis, another collection of council's.

In the meantime he extended the 'Corónica general de España,' which Osanco had carried no further than the death of the Scipios. After he had continued the history to the end of the Gothic period, Morales was sent to Leon, Galicia, and Asturias, to examine sepulchres and temples, archives and libraries; he collected many curious matters which was published from the original MS. in the Escorial, by the antiquarium Flores in 1765, and has been since inserted in the complete collection of Ambrosio's works, Madrid, 1791-2. It was important to explore all those places, in which ancient customs could be observed as to the restoration of the Gothic kingdom, and the centuries immediately following; papers and documents belonging to less antient times might be found everywhere, since by the request of Toledo they soon driven out of southern Spain. In his 76th year (1853) Morales finished the third volume of his history, which completed the work to 1037. By way of relaxation he printed a volume of the works of his uncle Fernando de Oliva; and he inserted as his last work, an exposition of his own and a great many of the illustrations of Cebas, and an exposition of Don Juan of Austria's device. The Inquisition suspended the publication of this book till certain passages in his uncle's works should be corrected, but as the Inquisitors neglected to make the corrections, the work remained unpublished. The late editor of Morales had a copy before him; and the pieces of Morales himself are included in the last and the only complete edition of his writings. In his seventy-second year he recast his favourite manual, 'Arte para servir a Dios,' the production of the unlettered Franciscan, de Marco, scholar, however as closely as he could to the mode in which the subject had been treated. In spite of its religious merits, Morales could not help wishing the work had been in better Spanish, and accordingly he undertook the labour of amending the language. He died in 1591, in his 72nd year, and was buried at Cordova pursuant to his directions. Cardinal Sandoval, his pupil, erected a fine monument to his memory, which was not completed till after his own death. Souto has given his obituary, but gives no opinion of his death, though he blamed at the same time his religious enthusiasm.

Ambrosio is the Leland of Spain, but, happier than Leland, he lived to make use of the materials which he collected, and we have the historical view from the historic early Roman period (where Osanco had left off) to the middle of the eleventh century. He accomplished this task with great fidelity and industry, though the reader may smile at his credulity. There is perhaps no historian whose personal character is better developed in his works, a circumstance which gives them a particular interest. Although any good historian of Spain must be more indebted to Morales than to any of his predecessors, it has been wrongly supposed that Garbay drew much from Morales. Estevan de Garbay y Vázquez was梅西 wrote first, and it is himself who praises Morales's diligence in copying documents, and commends the good use which he made of them. This testimony is honourable both to Garbay and Morales, since both had pursued the same course of research among the archives and the deeds belonging to monasteries and churches.

MORALES, CRISTOBAL, or CRISTOFORO, a great Spanish singer, who, about the middle of the sixteenth century, became the most eminent composer at the Roman Pontifical chapel. His masses and other sacred canticles were standard compositions till they were superseded by those of Palestrina, who followed soon after.

MORALES, LUIS, surnamed 'El Divino,' from having devoted his pencil exclusively and most successfully to sacred subjects, in which respect he is far from being alone among the numerous Spanish painters. His Saviours and Magdalens exhibit the extreme of human suffering endured with a celestial meekness. The same works badly imitated, or rather caricatured, by his son and several scholars. After his death we create a piece a year for the church of the society having been imputed to him either ignorantly or wilfully. Thus Pacheco ('Arte de la Pintura) considers him as a man who had a reputation which he did not deserve. Also his fellow contemporaries (Guzmán 'De los artistas') have affirmed that Morales never drew the human figure at full length. He must have done it however in some cases, according to the description of Morales's principal works given by the industrious Can Bernuex (Descripción de las obras de Bell. Art. de España). This tasteful and judicious critic moreover finds in Morales correct design, knowledge of the naked form, a fine gradation of tints, and the most perfect expression of sorrow, or true Christian grief.

Philip II, passing through Badajos on his return from Lisbon, in 1591, relieved Morales, who was then suffering from poverty and old age, with a yearly pension of 200 ducats. He thus made some slight amends for having dismissed him, and refused to employ his talents at the Escorial, after Morales had gone there by the king's express command. Morales was born at the beginning of the sixteenth century, at Badajos, where he died, at a very advanced age, in 1596.

MORALITIES, MORAL PLAYS. [English Drama, p. 227.]

MORALS is a word used in several different senses, which is desirable to distinguish. 1. It has been employed altogether with the expressions moral philosophy and moral science, denotes specially the science of what is called man's duty, what he ought and ought not to think, feel, say, do. In this sense of the word, morals is one department of metaphysico-mental philosophy, or mental science, or psychology (which, as we should distinguish, is a separate and independent science, morals), being another department. This is in every way the most convenient use of the word, and is now generally sanctioned by custom. In this sense of the word, a word is convertible with ethics and with deontology, a word which, contrary to the opinion of Bentham, is a subject matter of the science it denotes than any word derived either from the Latin moror or the Greek ethos (ethos), and which has also the advantage of being formed analogous to psychology, and to the names of most sciences. 3. Morals is ethics are at the same time names of different sciences of which the science latter is the science which has just been spoken of the art of performing one's duty, or as it is generally described, the art of living a good and a happy life. The art and the science of which the same science is a part is the art of living in this, that the same subject-matter is viewed from different points, the indiscriminate application of the same term to both engag-
The question, what does human happiness consist of? remains to be answered. And here too we can only generally indicate the mode of answering the question, rather than provide in detail the answer itself. Man is so framed by his nature as to be susceptible to a broad general account of morals, considered as the science of man's duty.

Morals then is a name for the science which teaches what it is man's duty to do and not to do, or (changing the phrase) what he ought and ought not to do; or again, what it is right to do; or (changing these pleasures and pains yet another change of phrase) which teaches what is respectively virtuous and vice. Our account of the science must necessarily commence with an explanation of this, its fundamental idea, which is thus expressed in so many different ways.

Morals are pleasures and pains, which determine whether he should do, or lastly, that is, virtue, which, on the most general view possible of the tendencies of a disposition or an action, conduce to that happiness of mankind. That which, of any two acts thus viewed, conduces the less to this happiness, is his duty not to do; or he ought not to do, or it is wrong for him to do, or lastly is vice. So, absolutely and unconditionally, of any disposition or action which tends, on the whole, to cause unhappiness.

It is generally sufficient for us to say, that the conduciveness to the general happiness of mankind is the criterion of duty or virtue.

Two questions now arise, to which, before we proceed further, some sort of answer must be given. The answers to these questions, indeed, by surrendering the idea of morals from two other sciences with which it is often more or less confounded, viz. mental science, or psychology, and theology, and also to point out the relations in which it stands to these sciences. The two questions are, what does human happiness consist of? and what renders the pursuit of human happiness man's duty?

We shall answer the second of these questions first. It is man's duty to strive to increase the general amount of human happiness, because he knows, both from the adaptation of his faculties to that end, and also from the full and complete revelation of God's will, that God desires the happiness of mankind. The full and detailed establishment of this proposition belongs to theology, in its two departments of natural and revealed religion. Thus is morals connected with theology. We have said that their provinces have been often more or less confounded, and this has taken place principally in two ways.

Dr. Paley having revealed, in a general manner, the assignment of rewards and punishments, in a future state, to the denominations of human actions, violation of this, some writers, as Paley for instance, have directly referred virtue to an expectation of these rewards and punishments, and, instead of treating them as something extraneous and accidental, have introduced them as essential parts of moral actions. Morals in this manner has nothing to do with these rewards and punishments further than to determine what are the dispositions and actions to which they are respectively assigned; and this is determined altogether independently of the rewards and punishments themselves.

The other way in which the provinces of morals and theology have been confounded (and here the confusion is complete) is by deriving all duty directly from the revealed will of God. Those who consult the Bible only, as being the divinity of God's revealed will, for a complete enumeration of their duties, clearly reject morals as an independent science, and merge it entirely in theology. It is needless to observe that the Bible, which, as Mr. Burke observes in a well-known passage, 'is not so much a history of morals as a history of manners,' xuan could not mistake his way, "cannot take the place of, any more than it can be superseded by, a science which systematically treats upon the duty of the principle of conduciveness to the general happiness of mankind.

Thus much in the way of preliminary disquisition. We now proceed to enumerate man's several duties.

It is of course out of the question to give a complete enumeration of single separate duties, or (in other words) to state in detail all that a man ought or ought not to do under all possible varieties of circumstances. This can hardly be expected, or at any rate is seldom professed. We are, as it were, overwhelmed, in the expression of duties directly related to the subject. The most at events that can be done here is to name, with the addition of some brief general explanation, the chief general classes of duties. The adaptation of these general duties to particular cases is a subject of those our enemies, which will not likely be noticed, the carrying out into minute detail of general rules of duty opens new and large departments of inquiry, which may be considered either as constituting separate sciences, or as belonging to other sciences rather than morals.

In thus taking refuge in a general classification of duties, we shall have to furnish the reader with a list of dispositions which it is the duty of man respectively to cultivate and not to cultivate. A disposition is what inclines (under what we understand thinking, feeling, speaking, and doing) generally in a certain way. The names for the different dispositions thus come to embrace general classes of actions. For instance, the disposition
ralled benevolence leads to innumerable actions which, under innumerable different circumstances, is man's duty to perform; and the name therefore stands as a general name for all these actions. To name singly and separately all these actions would perhaps not be practicable, and certainly not be desirable. Certain subclasses of them may be named, in explaining the beneficial tendency of the general disposition, or (in other words) the reasons why it is desirable to propagate this disposition. This last explanation will necessarily comprehend a general view of the different actions which the disposition tends to produce.

There are many different principles of classification on which the conception of duties may proceed. It is perhaps not too much to say that all duties may be deduced, with a greater or less exercise of ingenuity, as corollaries from any one which has been previously established. Thus Wollaston, in his 'Religion of Aristotle,' has reduced all duties from the duty of truth. Hobbes, again, in his 'De Cive,' derives all morality from the duty of preserving peace.

It is clear that the mode to be adopted of treating the subject, or, in other words, the mode of classifying our enumeration of duties, is a matter entirely of convenience, and, as a matter of convenience, we shall adopt the division of duties which has been partly acted upon by Dr. Paley, and which is perhaps the division most generally resorted to by writers on morals.

A man's duties, first, as they regard himself individually, and, secondly, as they regard others.

It is necessary to remark, in order to prevent misapprehension, that one duty is a duty towards oneself, and another duty is a duty towards others, not on account of its tendency respectively to produce happiness or misery, only to others, but simply from the accidental circumstance of oneself in the one case and others in the other being, as it were, the outward object of the action or disposition which constitutes the duty. Those acts of ours, for instance, which we regard primarily as means to our own happiness, are secondarily useful to others; and those which are primarily useful to others are secondarily useful to ourselves. (Analysis of the Human Mind, vol. ii., p. 234.) Much of the good resulting from the performance of a duty towards ourselves is in being thereby better enabled to do good to others; and together with the happiness conferred on others by the performance of our duties towards them, is the happiness caused to ourselves by the gratification of our feelings of sympathy and the additional security that is gained for the good-will of others towards ourselves.

1. A man's duty to himself consists generally in the preservation of the life with which his Creator has endowed him, and in the perfectment, to the greatest degree in his power, of the faculties which he possesses.

The first part of this duty is altogether negative. A man must abstain from wantonly exposing himself to danger, or, in other words, he must be prudent, and he must refrain from suicide. For when man learns to regard God has admitted him into this world to the production of general happiness, he learns at the same time that life has been given for that purpose; and in foolishly risking or in laying violent hands upon his own life, he tends so far as he can to mar God's object. He throws away his own means of attaining happiness in the way in which God has willed that he should attain it, and he destroys also his means of promoting the happiness of others.

As regards the second part of a man's duty towards himself, consisting in the improvement of his faculties, or, as we may otherwise express it, of his intellectual and moral being, this is partly positive and partly negative. It is a man's duty to improve himself, so far as he can, by study and by cultivating good dispositions; the full explanation of the best mode of doing which belongs properly to the subject of education. It is his duty also not to deteriorate his character by sensual excesses. The vices which he has to avoid are those of lust and intemperance: the latter of which divides itself into drunkenness and gluttony. The names of the two virtues opposite to the two vices of lust and intemperance are chastity and temperance.

The cultivation of these two virtues, or the absence of two corresponding vices, is recommended not only by the good accruing to the individual but also by the extent to which he is thereby saved from inflicting injury on others.

II. In considering a man's duties towards others, we would adopt the subdivision of duties towards men generally as men, and duties towards men as members of the same society. These duties, when they are again subdivided into duties towards members of the same political society or state, and duties towards members of the same family.

1. The duties towards men generally as men, or towards mankind, may be comprehended under the general name of benevolence or kindness, courage, sincerity, and humility.

In benevolence or kindness are included sympathy, or a general disposition to assist our fellow-men; pity, or kindness towards those in distress, and towards inferiors; generosity, or the giving of goods or of help gratuitously, which, being done with our own means serviceable to others, turns pity to good account; gratitude; and charity, in the sense in which it is used by St. Paul, or the disposition to judge kindly of others' conduct.

Of these, the opposite is the hatred, which is usually opposed to sympathize, pity, generosity, gratitude, and charity, and are selfishness, hardness of heart, cruelty, avarice, ingratitude, and meekness or wretchedness. Slander is one principal form in which the last-mentioned evil disposition displays itself. The cultivation of these two virtues as its acquired and permanent dispositions, and the avoidance of the opposite ones, have an obvious and immediate bearing on the happiness of others. At the same time it is not too much to be supposed that happiness accrues to the benevolent man himself from the gratification of his feelings of sympathy and generosity, as well as from the expectation of good to others he disposes others to do good to him.

Courage is valuable, as tending to give effect to our benevolence. It must not exist in such excess as to lead a man to adventure a great risk for a disproportionately small benefit, or good, or profit, or benefit to himself. Mill indeed has treated of courage as a particular form of prudence, a mode of treating of it which we cannot think proper.

Sincerity comprehends truth in words and honesty in actions in conduct. The manner in which the practice of these virtues, or the absence from the opposite ones of lying and cheating, is recommended by general utility, is obvious. Without the general observance of truth and sincerity, society must have no confidence in one another, and there would be no security or safety. The proof that 'honesty is the best policy,' pithily expresses the bearing of this virtue on one's own good.

It remains to speak of humility. This is perhaps not so essential in the practice of these virtues, or the absence from the opposite ones of lying and cheating, as it is of sincerity and truth, and which is very apt to degenerate into the failing called nationaliti. But nevertheless it is a virtue. As the general happiness is best pursued by each individual making his own happiness his own chief object, and again by each body of individuals making the pursuit of their own separate interests their chief object, patriotism properly tempered, or the desire to benefit one's own country as long as this is not done in such a manner as to injure other countries, is the proper means of promoting the general happiness of mankind. Of obedience to the law, with authority in a state, and to the laws, it belongs to morals to speak only in the most general manner. The filling up of the detail belongs to political science.

* * *

When we perform acts of courage or fortitude, the chance of evil, or of success, is as much as we make of it. If the good were not something more than a chance for the evil, the act would not be a good act of courage; because its net effect would not be a balance of good, but of evil. It would therefore be as much as we make of it. If the chance were not as good, it would not be a success or failure. We cannot do good; courage, in fact, is but a species of the acts of prudence; a choice between the two opposed dispositions, that is, when one of the two results, of either of a particular description, is to be regarded as the mark of a prudence of good (Mill's definition of the term "prudence"). There is an obvious difference, which Mr. Mill expressly has to be of value to others, courage being governed by prudence, as it is not a chance ought to be, and must be only done for the benefit of others.

We may agree with Mill either in classing courage among the duties owed by a man to others, or (as he does) in classing it among the duties owed by a man to himself.
science having determined what laws ought to be enacted, on the ground of conduciveness to general happiness, morals require the obedience of them, without reference to their individual goodness, but for the sake of maintaining political society generally, and of preserving to men all the advantages which political society yields.

3. The duties towards others who are members of the same family consist altogether in affection, which manifests itself differently according to the different family relations. Thus we speak of conjugal affection, paternal and maternal affection, filial affection, and fraternal affection. Conjugal affection implies fidelity. The proper exercise of the paternal affection is the education of the children. The exercise of the maternal affection is the education of the children. The exercise of the filial affection is the education of the children. The exercise of the fraternal affection is the education of the children. These feelings are so firmly rooted in the human breast as to be only in the peculiar relation under which the feeling exists.

Thus we have given a brief general summary of man's duties. We have said nothing of duties towards God, which are generally made to form a separate division in treatises on morals, because we consider that the duties, so far as they depend on God's special commands, and thus differ from the duties which we have enumerated, a set of which we come to know by observing their tendency to promote general happiness, belong to the separate subject of religion; in the same manner that the whole of the human body is subject to the assistance of the anatomists, and the individual parts of the human body are subject to the aid of medical science. Generally we may say that man ought to entertain feelings of reverence and gratitude to God, by reason of his superiority, and of the blessings which he has conferred upon mankind. This particular case does not arise from the general duties of gratitude to a benefactor and reverence towards a superior; and inasmuch as the application of the general duties to this particular case does not arise from the assistance of revelation, and involves no essential difference from the application to other cases, there seems no necessity for a separate division.

So also the duty of kindness to the inferior animals must be considered as arising from the general duty of kindness which has been inculcated. The pain which we believe that God wills shall not be inflicted upon men, we must believe too that he wills shall not be inflicted upon other animals which he has created. The pain of which animals are capable of inflicting upon us is the same as that by which men are susceptible; at least we have no means of conceiving any other sort of pain. And inasmuch as no different circumstances are introduced, there is no need for a separate division wherein to treat of our duties towards the inferior animals.

We shall not prolong this article by a list of works on the subject. The greater number of works which are professedly written on morals are, for a reason which has been already stated, in the hands of those who are not competent to be authors of part of mental science. Such for instance is the character of that part of the history of the moral science which is generally spoken of as belonging to the subject of morals. A good treatise on morals and a good history of moral science are both desiderata in our literature. Paley's treatise on Moral Philosophy, which is perhaps on the whole the best that we possess, has many faults both of matter and of arrangement; and the value of Sir James Mackintosh's History of Ethical Science, which enjoys, somehow or other, a high reputation, is accordingly his own. In other words, we have part of mental science, but not yet, in our opinion, not unjustly criticized 'A Fragment on Mackintosh.'

MORASS. [Marshes]

MORATIN, NICOLAS FERNANDEZ (the elder Moratín), a few months after his death at Madrid, where he died in 1789. Coming shortly after the poetical reformers Luizan and Montiano, he became the practical reformer of the Spanish theatre in the last century. His comedy 'La Pe- titemae' contains some fine passages, and 'La Pelote de Lucrece,' which has greater merit, the style is not always adapted to the dignity of the subject. Nevertheless of these pieces was performed; such was the prejudice against what was denominated French taste, and the good taste of the public were offended by it, and drove him from the stage, with the aid of an injunc tion from government, the 'Autos Sacramentales.' Besides remodelling the drama, Moratín was a still more successful restorer of lyric poetry in Spain. His talents and his amiable character soon gained him the friendship of the learned of the time—the Maestro Flores; the minister of the Holy Office of the Inquisition, the botanist and humanist Ortega; the eloquent Claudio Ferro, the translator and annotator of Buffon, and the editor of 'El Penedor,' the best periodical of that time; his own competitors or rivals, as it were, Montiano, Ayala, Cadahalo, and others, in word, works, as well as persons. We all sought Moratín's friendship. The Arcadiana of Rome gave him the name of Fluminse Thedmondino as a fellow-member. In 1764 he published periodical some of his light poetry, under the title of 'El Poeta.' Soon after appeared his best didactic poem on the country. "La Dama," which threw into the shade El Piscator Salmantino, Castro, Nito, Cernadas, and many other writers of that class, who were then corrupting the public taste and disgust the lovers of genuine poetry.

In 1776, through his patron the Conde de Aranda, he overcame the opposition of the anti-reformist performers to exhibiting on the stage his 'Hormesonda,' a tragedy, which is far from being perfect, thought it is the best of his dramas. The same subject has been treated by the living poet Quintana, in his 'Felogo.' This great effort of Moratín encouraged Ayala to write his 'Numancia destruida.' Cadahalo, his 'Sancho Garcia,' and Huerta, his 'Raguel,' in order to support tragedy in her new gare on the Spanish stage. From a conversation between the above-mentioned 'El Señorito Mimado,' and 'La Señorita mel criada' of young Thomas Iriate or Iriarte, and 'El Delinquente homrado' of Jovellanos, advanced that reform in comedy which Moratín's son Leandro accomplished. Moratín wrote another comedy, 'El Policrato,' which contains several fine passages, but it was not performed.

Unassuming and of too retired habits to make his way in the world, totally helpless when brought among place of glory, Moratín never imported the great, even not to those to whom he was justly accessible. He was neither expected, and he got nothing. He practised the law merely for the sake of providing for his wife and son. From this ungenial labour he was last released by a friend Ayala who, for the benefit of his health, selected Moratín as the person best qualified to fill his chair of 'Poesta,' a situation for which these two friends had before been competitors. A poet is hardly at home in the field of practical utility. However by a 'Memoria' on the means of encouraging agriculture in Spain, he without injuring the breed of cattle, Moratín attracted the attention of the Economical Society of Madrid, and soon became an active member of it. He always refused to make any application to the Spanish Academy and to the 'Instituto de Historia,' even when it was mentioned to him. A mere poet, indeed, 'What absurdity,' he once wrote to Luigiano, 'to compel an aspirant to literary honours to beg for them, just as a person wanting a place in the 'Exerco' has to petition for it.' Moratín, in his 'Cartas,' passed unnoticed when the Spanish Academy created a much inferior composition of José Vaca de Guzman.

Many of Moratín's prose writings, and the whole of his interesting correspondence with Bayer, Conti, Llaguno, Cadahalo, and others, have been lost in consequence of repeated searches and seizures of the family papers in Ferdinand's reign. Among them was perhaps his 'Historical Letter on Bull-fights,' proving them to be not derived from the Romans, but peculiar to Spain. This work however is not the least mentioned. In the 'Historical Notice of his father, which he prefixed to the 'Obras Postumas de Don Nicolas Moratín' (Barcelona, 1821, and London, 1825). This edition is founded on a collection of the author's poetry, which he himself gave in a corrected copy of his book to his friend, to be printed. Interspersed in it are the following pieces, which have particular merit:" Las Naves de Cortés," 'Amor y Honor,' 'Sancho Don en Zamora,' 'Abedulcar y Galiana,' 'Con el Pas de los Ases,' 'El Bolso de una Larga Ciudada,' 'El Empato de Micer Jaques Borfgion.' There is a collection of dramas and other works of Moratín, but it is a rare book.

Cut off unfortunately in the prime of life after struggling with the difficulties inseparable from the position of an author, and boldly opposing the routine established by ignorance and fashion, the elder Moratín nevertheless succeeded in effecting a beneficial change in public opinion, and he gave it the sanction of his high moral and intel
lecular character. This was a glory the more enviable and rare inasmuch as it is derived solely from the services which he rendered to his country.


MORATIN, LEANDRO FERNANDEZ, son of the preceding, a greater dramatist than his father, and also one of the Arcades of Rome under the papacy. He was born at Madrid, on the 10th of March, 1760, to be at six or seven years of age, and obtained at the age of eighteen a second prize or access to the Spanish Academy for his heroic poem entitled - 'El Príncipe de las Nieves.' In order that his success, he secretly availed himself of the few leisure moments which he could steal from the mechanical occupation of a jeweller, to which his father had bound him, in order to divert his mind from poetry, and save him from the evils of poverty. Fortunately, his daily wages of eighteen reals (about 3s. 6d. of our money), which he gained by his humble occupation, enabled him, after the early loss of his father, to support himself and his mother. But soon losing her also, Moratín joined an uncle, who was a jeweller, and without however discontinuing his intercourse with the learned, such as Melon, and Fathers Estain and Navarrete.

Directed by these distinguished individuals, his muse was further encouraged by the above Society with another access or prize, for a poetic satire, and, as it was required to be by the academical programme, against poets. It is in fact a short Arta Poética, far more methodical and critical than the previous metrical compilation of rules by 'Juan de la Cueva,' but it has been superseded in its turn by the more complete and didactic 'Poética' of Martínez de la Rosa, in 1827.

At the suggestion of Jovellanos, Moratín became secretary to Cabarrus, a high statesman and financier, who was sent, in 1769, by the Spanish government to Paris, and on his return in 1789, the young poet chastised, in most humorous and witty prose, the intruders into Parnassus, in his anonymous 'Derrata de los Pedantes,' written in the style of the 'Viage al Parnaso' of Cervantes. In the same year, the celebrated minister Floridablanca rewarded his ode to the new king, Charles IV., with a small pension; but he was at last raised to independence by a much greater patron, 'El Príncipe de la Paz,' the great favourite of both king and queen, once the arbiter of the whole Spanish empire in both hemispheres, and now forgotten. I would live—Godoy. To Moratín's credit, it ought to be remembered, that he never kicked, as so many did, the fallen political lion.

In 1794 he brought out on the stage his play of 'El Viejo y la Niña' (which shows the consequences of gross discrepancy of age in marriages), his first and most delightful drama. In 1792 followed 'La Comedia Nueva,' or 'El Café,' a very coarse satire against stage absurdities and bad taste, which cannot be translated on account of its local and national allusions. About this time Moratín travelled through France, England, Belgium, Germany, Switzerland, and Italy, both to observe society and the art of reflecting on it the stage. He returned in 1796, and in 1798 he published his translation of Hamlet, which is a complete failure. More fortunately afterwards, he produced in 1803 'El Baron' (or the Impostor), which though not one of his best performances, relieved a similar piece of 'La Lugareña orgullosa;' in 1804, 'La Montañesa,' a hypercritical young lady preparing herself for the cloister in order the better to catch her intrigues; in 1806, 'El Si de las Niñas,' the subject of which also is a female who defeats all her mother's attempts at restraint, and the object of her previous instructors. It was represented twice, in the same year, and afterwards translated into many languages.

Elated by his popularity, Moratín was preparing some new scenes, when the suspicions of the Inquisition, which were cavilling against his plays, were expressed against his author. Although powerfully shielded by Godoy, his 'Escuela de los Marinés,' Molière's 'Ecole des Maris' (admirably adapted to Spain and modern times), was not represented till the 17th of March, 1812, under Joseph Bonaparte, who made the restoration of Ferdinand in 1814, Moratín's property was seised, and himself reduced to actual starvation. Still, before the close of that year, friendship and gratitude, the prominent features of his character, induced him to prepare, for the benefit of the actor Blanco of Barcelona, 'El Medico a Palos,' a piece which was modelled, with proper adaptations, on Molière's Médicin malgré lui; but though he was in its quality, the most important and commercial production of the year, he left that city again on account of the yellow fever, and went to join his friend Silvela at Bordeaux.

He now devoted himself exclusively to the improvement of his own 'Orígenes del Teatro Español,' a work of vast extent and rare merit, which was published in 1803, far from being exhausted, and is discontinued by the author just before the appearance of the exuberant Lope de Vega and his prolific school. At the end of 1825 Moratín's health began to decline. Accompanied by Silvela, he returned in 1826 to Paris, where he died on the 31st of June, 1826, and was buried near Moléres's monument in Père la Chaise.

Although a lyric poet of equal genius and more taste than his father, and though he had the credit of having improved that branch of poetry, it would be out of place to bring the Spanish ear, and of having moreover used new combinations of metres and rhymes, Moratín did not consider himself entitled to the double title of a lyric and dramatic poet. A severe correctness, an excessive caution against all flights of imagination and strange poetical associations, was the control of judgment, deprived L. Moratín of that originality and freedom which are necessary for one who would aspire to be a first-rate poet. He is very roughly handled by the Foreign Quarterly Review (vol. ii., p. 599), but he is vindicated, comforted, and defended from the scathing irony of the above critic (vol. ii., p. 147). Galiano (Athenaeum, 1834, p. 371), in his attempt to steer a middle course between the two critics, after acknowledging that L. Moratín 'accurately portrayed the manners and formalities of French society,' lowers his praise in rather a summary manner to that of an 'excellent amateur.' But how could the characteristic vivacity and freedom of that society be exhibited in what Galiano calls 'meagre and uninteresting plots.'

Instead of discussing the great object of former dramatists, L. Moratín was poetically fond of simplicity, as an element of beauty. Moreover, it was by constant observation in the ranks of middle life that he attained the power of correctly representing the faults and feelings which characterise that class of society. It would be out of place here to touch on the dispute between the classical and romantic schools, in which the two Moratins were involved.

The poetical works of L. Moratín having been purchased in 1824 by his friend Arnao, the greater part of them were published in London, Paris, and Madrid, and were reprinted in the same year, in 3 vols. 12mo., in the following year. Part of this collection, 'Poesías Líricas de L. Moratín,' were printed in London by Calero, for Salvá, in vol. 12mo., 1825.

The splendid edition, in three thick vols. 8vo., by the Spanish Academy in 1830, of the 'Obras de Don Leandro Moratín,' was reprinted in 1835, at Barcelona, without the 'Orígenes.' This edition of 1830 does not comprehend 'El Pueblo de P. Logroño,' which appeared in verse with notes under the name of the 'Bachiller Gines de Peralta,' nor the following works, which remain in MS.: a translation of Canadé: a fragment of his own life; 'Viage a Inglaterra é Italia,' 'Catalogo de todos los Escritos Españoles del género escénico conservados,' 'Mémoire concernant quelques opéras de drame compostions,' abridgement of 'Fray Gerundio,' &c. Exemplary correspondence with Jovellanos. Llaguno, Cax. Ferrier, Signorini, Conti, and others. All these works were now collected in 1831 for the press, by Salvá and Silvela. Of L. Moratín and his family, the foundation of his fame, numerous editions have appeared.

(Obras de Martinez de la Rosa, vol. ii.; Cortejo, Juán Critico de D. L. Moratín, Barcelona, 1833; Revilla, Juán de Avila, D. L. Moratín, Sevilla, 1833; Brunet, Supplement a l'Abecedario Méridional Libro de Librería, Madrid, 1824; and C. H. Senior's Catalogue of Spanish Books, 1835.)

MORAVIA (in German, Machern; in Slavonian, Morava) is a German province of the Austrian monarchy, situated between 48° 40' and 50° 22' N. lat., and 13° 10' and 17° 17' E. long., including in these limits Austrian Silesia, which extends along the whole north-eastern frontier, and with...
which it forms one province. It terminates in a point towards the north, and is bounded on the north-east by Prussian Silesia and Galicia, on the north-west by the Prussian county of Glaz and by Bohemia, on the south-east by Hungary, and on the south-west by Lower Austria. Its area is rather more than 10,000 square miles (of which Austrian Silesia is nearly 1800 square miles). The population is 1,350,000 in 1854, of which 470,000 belong to Austrian Silesia. The eastern part of the province is into eight circles, viz. Olmütz, Brünn, Iglau, Znaim, Hradisch, and Praga in Moravia, and Teschen and Troppau in Silesia.

Agriculture and Climate.—Moravia is divided from Bohemia by a chain of mountains called the Bohemian-Moravian chain; from Prussian Silesia by a part of the Sudetes, called the Gesenke, or the Moravian chain; and from Hungary by the much higher and wider Carpathian range. Moravia is thus shut in by mountains on the east, north, and west; it is open towards the south, in which direction the Morava takes its course towards the Danube. The interior is traversed by other chains, so that more than half of the country is mountainous. One of the most remarkable of these latter chains is the range extending from Brünn to Olmütz, and thence eastward. It contains numerous caverns and hollows, the best known of which is the Mazač, sixteen miles north-east of Brünn, a 300 feet long cave, starting at 950 feet deep, in the midst of a forest. The mountains however enclose fertile valleys, and the lower part of the province, about the centre and towards the south, consists of fine extensive plains, the soil of which is extremely fruitful. The Morava rises at 900 feet above the level of the sea, declining rapidly towards the south. The rivers are numerous: the largest is the Marsch, or Morawa, which gave to the country the name which it has borne ever since the end of the seventh century. This river, the Thaya, and the Mura, of which difficulties rise in a cavern at the northern point next to Bohemia and Glaz, flows in a southern course through the middle of the country, receives most of the rivers (excepting a few that run into the Oder), especially the Tisa, the Warta, and the Varta, the principal stream on which it forms the boundary between Austria and Hungary, falls into the Danube above Presburg. There are no lakes properly so called, but numerous meres or ponds abounding in fish, of which there are 465 in the circle of Znaim alone, the total surface of which is said to be nearly 100 square miles. Moravia is subject, from the inequality of its surface, to considerable variation of temperature; but notwithstanding its elevation and northern latitude, it enjoys a mild and healthy climate, the air being a parallel. The greatest heat in summer is 92°; in winter the mercury sometimes falls to 16° (Fahrenheit). The mean annual temperature at Olmütz is 48°.

Natural Productions.—The animals are horses, oxen, sheep, and hogs; besides it has many game, feathered game and domestic poultry, especially geese, of which great numbers are exported. With respect to the productions of the soil, Moravia is one of the richest provinces of the empire. Of corn it has on the whole more than sufficient for its own consumption, especially an abundance of very fine wheat. Very large quantities of rye, barley, and oats are grown. Flax is the most important product, and it is nearly equal in quality to that of Prussian Silesia. Hemp is cultivated in this province to the extent of about 50,000 acres, and the flax is so great, that large quantities of both are imported. Fruit is plentiful and of good quality. The vine flourishes in some parts; and between forty and fifty years ago, so much land was appropriated to the culture of the vine, that the yield exceeded the demand. Moravia was granted a privilege by the Emperor Francis, by which it issued an ordinance prohibiting the laying off of new vineyards. The forests furnish vast quantities of timber for building and fuel, peat, galls, nuts, &c. The pastures are extensive in the mountain districts. The woods in general are of great value, and besides the growth of gold and silver were worked, but they were neglected in the troubles of the fifteenth and sixteenth centuries, and have not been resumed. At present iron, sulphur, vitriol, alum, coals, salt, and bitumen, and some precious stones, particularly topazes, are produced.

Manufactures and Trade.—The woolen, linen, and cotton manufactures are very flourishing, and on a large scale, and furnish supplies for an extensive export trade to Germany, Hungary, Austria, Italy, and the Levant. The manufacture of thread is likewise considerable. Dyeing is carried on at Brünn, which is particularly celebrated for dyeing the Austrian red. Moravia enjoys also the benefit of a great transit trade. The imports are chiefly produce, wool, Vienna silks, Russian furs, tallow, wine, oil, porcelain, glass, &c.

Religion, Education, &c. The inhabitants are partly of Slavonian and partly of German origin, the former being about three-fourths of the whole. In 1853 there were 425,000 Germans, 1,399,000 Slavonians, 27,358 Jews, and 96 Gipsies, all professing the Roman Catholic religion, excepting the Lutherans, who have 54 churches; 14,000 Calvinists, with 17 churches; and 12,000 of the Jews, who have 54 synagogues. The Roman Catholics are under the archbishop of Olmütz and the bishop of Brünn: Silesia is under the bishop of Breslau. There is a university at Olmütz, re-established in 1827; gymnasia in every circle, Moravia was added to higher branches of learning, and about 1500 schools in the towns and the country, in which 130,000 children are educated. The charitable institutions, such as hospitals, asylums for the blind, &c., are numerous.

History.—Moravia was inhabited by the Quadi and Marcomanni during the existence of the Roman empire. When the Quadi went with the Vandals to Spain in 407, the country was occupied by the Suevi, the Rugi, the Heruli; and, about 486, by the Lombards, when a kingdom of Moravia, more extensive than the present province, was formed. Moravia was conquered by Charlemagne, who compelled Sampsis, the king, to be baptized. After numerous vicissitudes, Swiatopulik united all the tribes, and formed a kingdom, which was divided into parts between Bohemia, Brandenburg, Pomerania, Lusatia, Silesia, part of Upper and Lower Pannonia, and Dalmatia. This prince died in 894, and was succeeded by his three sons. By dissensions between them, and unsuccessful wars with the Boi (Bohemia) and the Magyars, Moravia was finally cut off from the possessions of the house of Austria, with which it has over since been united.

There are many considerable and flourishing towns in Moravia, some of which have already been described [Austerlitz; Brünn], and others [OLMÛTZ; TESCHEN; TROPPAU; ZNAVEY] will be described in their order. There are also other flourishing towns. In the circle of Olmütz is Stierberg, a municipal town belonging to the Prince Liechtenstein, which is situated on the Moldau, in the Tatra district. The chief town there is the chief town. It has four suburbs and several churches. There are manufactures of fine cloth, kerseymere, and linen, several brandy distilleries, and the greatest corn-market in Moravia.

The population is nearly 9000. In the circle of Brünn is Nicoldeburg, the chief town of an extensive lordship belonging to Count Dietrichstein: it has a palace, with a library of 2000 volumes, a fine cathedral and several other churches, a gymnasium, &c. It has about 3000 inhabitants and about 30 churches. The city has a magnificent palace, the usual summer residence of Prince Liechtenstein, with one of the finest and most extensive parks in Germany, in which there is a celebrated tower in the Oriental style, 216 feet high, the finest in Europe, and an immense range of magnificent gardens and trees and plants. Eschzab has 1800 inhabitants.

Iglau, the capital of the circle of the same name, is a well-built walled town on the river Iglawa. It has 6 churches, a gymnasium, a well-endowed hospital, flourishing manufactures of woolen cloth, linen, and cotton, in which there are 300, and an immense range of magnificent gardens and trees and plants. The population is 14,000. The celebrated fortress of Spillberg, in which State prisoners are confined, is in the circle of Brünn.

STEIN; HIRTL; BLUMENBACH; ROHRER; OSTERREICHISCHE ENCYCLOPÆDIE, &c. Moravian Mountains. [GERMANY.]

Moravians, or Moravian Brethren, a congregation of Christians descended from the Bohemian bro-
thren, who were a branch of the Hussites. [Hoss, John.]
The Bohemian brethren dissented from the Calixtines, and refused to subscribe to the articles of settlement between that party and the council of Basle in 1433. They then formed themselves into a distinct community, called ‘the brethren’s union,’ and as they were obliged to live in seclusion through fear of persecution, they were called the enemies ‘Grubenhaimer’ or Trophys. They looked upon the Scriptures as their rule of faith, rejected transubstantiation, and were very strict in their discipline, excluding the vicious, the scoffers, and the worldly from their communion. They established among themselves a synodal court of spiritual and civil conduct of individuals, who were distributed into three classes, the beginners, the proficient, and the perfect. They had their bishops, priests, preachers, and deacons, who administered their civil as well as ecclesiastical affairs. Like the Quakers they refused to do military service.

When the great Reformation took place in Germany, the Bohemian brethren sent envoys to Luther in 1522, who approved of most of their doctrines and discipline, and although he did not admit the validity of their confession of faith, yet he said that it might be tolerated as it was. (Mosheim, Ecclesiastical History, sixteenth century, iii. 2, 2.)

In 1547 most of the brethren were expelled from Bohemia by Ferdinand I., upon which they took refuge in Poland and Sweden, and formed themselves, especially at Marienwerder. They were united for a time with the Lutherans by the convention of Sendomir, but afterwards drew closer to the Calvinists at the synods of Ostrorg in 1628 and 1627, and adopted Calvin’s creed, retaining their own synodal court of discipline. (Raiser, Breve Conspectus Doctrinae Pragmati Bohemoriae, in Gerdos’s Miscellanea Groningana, vol. vi.)

Under Maximilian I., those brethren who had remained in Bohemia and Moravia enjoyed a considerable degree of freedom, and formed a settlement at Prague in Moravia, where they received the name of Moravian brethren. But in the subsequent Thirty Years’ war, their settlements in Bohemia and Moravia were utterly destroyed, and all the Moravian brethren were scattered and settled in 1792, by Count Zinzendorf, on his estate of Betholdshof in Upper Lusatia, where their colony took the name of Herrnhut, from a hill in the vicinity called Hutsberg. They then established themselves as a new community under the name of the United Brethren, to which Erastus Gebers, of Saxony, who had suffered for their cause, was admitted, without being obliged to renounce their respective creeds, but on condition of conforming to their rules of discipline, which were derived from those of the Bohemian brethren. Since that time the community of the United Brethren has spread through Germany, Holland, the United States, and other Protestant countries. Wherever they have formed a new and distinct settlement, they have enforced their regulations, and adopted the discipline of the community, but there are many Moravians scattered about in towns among people of different communions, where they form small congregations and have their own meetings. The Moravians do not assume to constitute a separate sect, and whenever they have been regarded as a body to state their creed, they have professed a general adherence to the confession of Augsburg, and their preachers, without pledging themselves to all its articles, reject any doctrine which is utterly repugnant to it. They avoid discussions on the speculations of the schoolmen, and give their minds to the contemplation of God in Christ, and consider the life, sufferings, death, and merits of the Saviour as the foundation of their faith. They look upon the Scriptures as the revelation of God. They also believe that the Spirit of God continues to enlighten the prayer and conduct of the true disciples in regulating their conduct, and they make a practice of invoking it in circumstances of doubt and uncertainty, before coming to a determination. Each community, represented by elders, preachers, and deacons, provides for the spiritual welfare of its members, hospitals, schools, orphan age, hospitals, and other public establishments, and the funds for these objects are raised partly by subscriptions and partly by rates levied on the householders. In other respects every family in the community carries on its private affairs, and manages its interests and properties in other communities. The erroneous notion of their having community of goods arose from the circumstance that some of their first settlers in North America, being few and forlorn among strangers, found it convenient for a time to put their earnings into common stock.

The principal settlements of the Moravian brethren are—Herrnhut in Lusatia, which is still their head establishment; Nischy, in the same province, where they have a college, as well as at Gnadendenf in Silesia; Christiansfeld in Holstein; Neustadt an der Orla, in Brandenburg; and in the wilds below Coblenz, a flourishing settlement in a beautiful situation; Moraim in the canton of Neuchatel in Switzerland, where they have an institution for boarders; Zoszt near Utrecht; Fulneck in Yorkshire; Fairfield in Lancashire, Ockbrook in Derbyshire; Gracehill in the county of Antrim in Ireland; Apes Hill in South Russia near Astrakhan; Bethlehem and Nazareth in Persia, in the latter of which places they have a college; and Salem in North Carolina. One of the principal objects of the Moravian insti tution is to send out missionaries among the heathen. They have missionaries among the Caffrees and Betchouannas in South Africa, among the Delaware Indians and the Cherokees in North America, among the Eskimaux of Labrador, and among the negroes of the West Indies.

The Moravians are simple and unostentatious in their dress, and like the Quakers, reject all gaudiness and ornament. Promiscuous assemblages of the two sexes are forbidden among them, as well as plays, games, and dancing. They have however church music and singing. The unmar ried are not allowed to remain single longer than four years, and those who have entered into matrimony are not allowed to form single brotherhood, under the superintendence of an elder, and there are likewise houses for single sisters and widows. Marriages among members of the society must be sanctioned by the elders. They wear no mourning for the dead, but consider it a happy release from earthly bonds, their expression on such an event is, that the deceased is gone home to the Lord.

The Moravians in general bear a very good character: they seem to have reason, benevolence, and all other Christian qualifications, the great Christian spirit of charity; they are not exclusive, and the differences which exist among the various Protestant sects seem among them to be smoothed down and almost obliterated. They are not narrow in their opinions, and are very numerous in their society. They are among those who are reckoning them in the ‘Encyclopedia Americana,’ under the head ‘United Brethren,’ it is stated that there are not more than 14,000 professed members in Europe, and about 4000 in America. But these members are independent of a much larger body of Protosts of dissent from the Moravians, who have not having subscribed their articles of discipline, or forming part of their congregation, either live along with them, or are connected with them, and receive instruction from their preachers, besides the converts whom their missionaries make among the heathen, who has written a history of the Moravian or United brethren.

MORAY, or MURRAY FRITH, is a gulf of the German Ocean, bounded on the north-west by the counties of Ross and Cromarty, and on the south-east by those of Nairn and Elgin. The northern extent nearly in a straight line from Kessock ferry, opposite the town of Inverness, to Torbet-Ness, the north-western extremity of Ross-shire, a distance of thirty-two miles. Midway between these points is the entrance to the frath and harbour of Cromarty, the Port Sesquens of the Romans. The south-eastern shore extends from the town of Inverness to Fort George, and thence to Burghead on the coast of Elginshire. The ports along this shore are merely tidal havens.

The Moray Frith contains the purpose of Bannockburn, under the name of Loch Beauly. At the head of this loch is the embouchure of the Glass-water, and the north-eastern extremity of the Caledonian Canal unites with it to the west of Inverness. Vessels of large burthen come up towards the anchorage is safe. The berring fishery of the frith is of great value. In the year 1834 there were 19,556 barreis cured at Banff, the principal part of which was taken in the Moray Frith. The Gaelic name of the Moray Frith is Farar, or Varar; the latter of which names is now disused.

(Map of the Shires of Ross and Cromarty in the New Statistical Account of Scotland; M’Callum’s Stat. Acc. of Brit. Empire.)

The northern side of the department is occupied by the lower slopes of the Monts d'Arrée, part of the great Arnoetian chain: a range of low hills branching off from these, and running south-west, separates the valleys of the Oust and Blavet. The whole department belongs to the great district of the primitive rocks, which occupies the north-western extremity of France. The only metal procured is iron; some authorities add lead, but there are no lead-mines of any importance. The soil is composed of earth, sand, and clay, in which are found in them six furnaces for making pig-iron, and eight forges for making wrought-iron. The fuel employed is charcoal. Slate is quarried, and rock crystal, potter's earth, and a kind of sand which resembles emery are procured. There are considerable salt-mines in the marshes along the coast, and a number of mineral springs.

The rivers run from north to south, and from the proximity of the mountains in which they rise, to the sea, are commonly small. The Ille has its source in this department, flows in the adjacent department of Finistère, and at its mouth forms the boundary between the two. The Blavet rises in the department of Côtes du Nord, enters this department on the north side, and flows to Pontivy, where it becomes navigable. From thence it flows south-west into the sea opposite the island of Groix in the Gulf of Morbihan, its whole course is about 70 miles, of which 34 miles are navigable. It receives the Ile au Sor, the former just at its mouth, which forms the haven of Pont sur la Mer. The Auray and the Arz are navigable for about 24 miles within the department. It is navigable in the part of the course which is in connection with this department. The Oust rises in the department of Côtes du Nord, and entering this department on the north side, flows south-east past Rohan, Josselin, and Maltrétoir (where it becomes navigable), into the Blavet: the last six or seven miles of its course are on the border of the department. Its whole length is about 70 miles, for 24 miles of which it is navigable. The Ille, the Trinité (which receives the Due), the Claye, and the Aff flow into the Oust: the Aff forms for some distance the western border of the department.

The canal from Nantes to Brest enters this department on the east side near Rieux sur la Vilaine. The summit-level of the part between the Vilaine and the Blavet has a length of a mile and a quarter; the length of the canal from the Vilaine to the summit-level is about 65 miles, with a rise of nearly 400 feet obtained by forty-two locks. The length from the summit-level to the Blavet is not more than 7 or 8 miles, with a full of 330 feet obtained by eighteen locks. The canal runs through the last 10 miles of the Josselin and the neighbourhood of Rohan. After crossing the Blavet the canal follows the valley of that river into the department of Côtes du Nord.

The inland navigation of the department is thus given in the Government of the department:—Vilaine, 25 miles; Oust, included in the navigation of the canal from Nantes to Brest; Aff, 4 miles; Arz or Arz, 3 miles; Blavet, 9 miles; upper part of the Blavet, called Canal of the Blavet, 37 miles; Scorff, 9 miles; canal from Nantes to Brest, 50 miles: total 165 miles.

There are seven Routes Royales, or government roads, having an aggregate length of 348 miles, viz. 186 miles in repair, 96 miles out of repair, and 64 miles unfinished. The road from Paris to Brest is interrupted by the Blavet, for about 3 miles, from the great Brest road at Rennes (Ille et Vilaine), and entering this department on the east side, runs by Ploérmel, Josselin, Lœmeun, Baud, and Hennebont. Roads run from Vannes to the department (Loire Inférieure) by Muzillac and Roche-Bernard; to Dinan (Côtes du Nord); to St. Malo (Ille et Vilaine) by Ploérmel and Maltrétoir; to Guingamp and Lannion (Côtes du Nord) by Locmaria and Pontivy; to Quimper and Brest (Finistère) by Auray and Hennebont; and to St. Pâol and St. Pôl de Léon (Finistère) by Ploérmel, Le Fouaret, and Gouren. A road from Ploérmel runs by Maltrétoir into the department of Loire Inférieure; and roads from Pontivy run to Josselin, to Baud, and to Loudes (Côtes du Nord). The length of the roads is about 248 miles, viz. 191 miles in repair, and 69 miles out of repair: the bye-roads and paths have an aggregate length of nearly 3000 miles.

The air of the department is temperate but moist. Ages
prevail along the coast. The valleys which intersect the hills on the north side of the department are frequently very fertile; and there are extensive plains along the coast, which produce abundant harvests. The wide heaths which are characteristic of Bretagne form more than a third part of the whole department. About 650,000 acres (above one-third of the whole department) are under the plough. The grain chiefly cultivated is rye; but buckwheat, oats, and a little wheat are also grown. The potato, and especially the turnip, is about sufficient for the consumption of the department. Turnips, lentils, flax, and hemp are extensively cultivated. There are about 42,000 acres of orchards and garden-ground; the fruit is generally good. The apple, which is the chief drink of the peasantry, there are about 1700 acres of vineyards, from which a little wine of ordinary quality is produced. The woodlands have an extent of about 85,000, to 90,000 acres. The meadow-land comprehends more than 170,000 acres, besides nearly 30,000 acres of heath or open pasture-ground. Strong draught horses, horned cattle, and sheep are numerous. A government stud is kept up at Lanconnet or Langonnet. Bees are numerous, and their honey is considered excellent. The rivers and the coast abound with fish; and the coasts are likewise frequented by great numbers of water-fowl.

The department is divided into four arrondissements, as follows:

<table>
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<tr>
<th>Area in sq. miles</th>
<th>Population.</th>
<th>Communes</th>
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<tbody>
<tr>
<td>1031</td>
<td>130,000</td>
<td>1,037</td>
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The arrondissement of Vannes are—Vannes (pop. in 1831, 6895 town, 6358 whole commune; in 1836, 6523 commune) [Vannes], on the Gulf Morbihan; Sarzeau and Quiberon (pop. of whole commune 6126), on a peninsula called the peninsula of Ruis, between the gulf of Morbihan and the mouth of the Vilaine; Muzillac, near the mouth of the Vilaine; Riec-sur-Belon, and the Sibenec, that river; Carcass, on the Aff; Rochefort, on the Artz or Arz, and Quegtembert (pop. 3261 commune), between Vannes and Quiberon. Vannes is chiefly inhabited by fishermen. In the peninsula of Ruis, near the town, are the castle of Suscinion, built by Anne, the last duchess of Bretagne, and the village of St. Gilles de Dour, of the monastery of which Abbad was abbot. La Roche-Boarde was formerly one of the nine baronies which sent deputies to the states of Bretagne. It is the centre of a grazing district in which many cattle are reared; the inhabitants manufacture pottery and trade in linens.

In the arrondissement of Pontivy are—Pontivy (pop. in 1831, 4112 town, 3956 whole commune; in 1836, 6378 commune), on the Blavet, on the 51st of Scorb; Lorient (pop. 5120 commune) [Lorient]; Loemang, on a small feeder of the Gueunen, on the Scorb; and Loescuit and Gourin (pop. 3362 commune), on the Ellé or its affluent. Pontivy owes its origin to a monastery founded here, a.d. 666, by St. Jonas, brother of Judas, one of the early kings of Bretagne. The town was in the feudal ages capital of the duchy of Rohan; it consists of two parts—the old town, in which are the remains of a castle belonging to the dukes of Rohan, and the new town, which consists of a few streets. There are five bridges over the river; there is a market day, and some pleasant promenades. During the Imperial régime the town of Pontivy bore the name of Napoleonville.

In the arrondissement of Lorient are—Lorient (pop. in 1831, 14396 town, 18322 whole commune; in 1836, 16975 commune) [Lorient]; Port Louis (pop. 2024 town, 2591 whole commune), and Hennebicq (pop. 3360 town, 4477 whole commune), on the Blavet; Flouey (pop. 3916), between the Blavet and the river Auray; and Pluvigner (pop. 4534), between the Auray and the Blavet. Port Louis was built by Louis XIII. In an advantageous situation for trade, at the mouth of the Blavet, to which, as well as to the town, the name of Port Louis was given. It is a peninsula, and is defended by bastions and a citadel which command the approaches to the town and the entrance of the port. The inhabitants are engaged in trade and in the sardine or pilchard fishery; a good deal of garden-ground is cultivated in the vicinity.

During the Revolutionary period Port Louis was called Port Libéré. Hennebicq was a city of great strength, and derives interest from the gallant defense made here by Jeanne, countess of Montfort, a.d. 1342, against the forces of Charles de Blois, competitor with her then captive husband. Jean de Montfort, for the ducal crown of Bretagne. [BRETAGNE. The ancient massacre of Port Louis still bristles with the memories of the inhabitants. They flanked by strong towers, the battlements and machicolations of which are in some places almost entire; one of the ancient gates is used as a prison. There is an ancient Gothic church at Hennebicq, but not within the ancient walls. During the Revolution a magnificent edifice, the house of the abbey of the la Joie, a fine building in the vicinity, only the fortiest entrance and some ruins remain. The townsmen trade in corn, hemp, honey, wax, cider, iron, and soap. Auray also possesses historical interest; here was fought (a.d. 1364) the battle which closed the struggle of De Blois and De Montfort for the duchy. [BRETAGNE.] The town is prettily situated at the base of an eminence, on which are the ruins of an ancient fort. Many interesting buildings and religious houses were destroyed during the Revolution. There is a Carthusian convent near the town, where repose the remains of some of the saints who preached in these parts. Quiberon is a town; it is a port, feeding off the Aff. Ploërmel was formerly a town of considerable consequence; the dukes of Bretagne sometimes held their courts there, and many of them were interred in a Carmelite monastery. The walls of the town now exist. Ploërmel is besieged by Henri IV, and the edifices of the town sustained considerable damage. There is a Gothic church connected with an Ursuline nunnery, which has some fine stained-glass windows, and the tombs of two of the dukes of Bretagne, removed both from the cathedral of St. Peter. The tombs are finely sculptured, and are in a perfect state. There are at Ploërmel a high school and an agricultural society. The townsmen trade in linen, corn, thread, butter, paper, leather, and cattle. Josselin has the post-office of the department, and is an antiques market. There are橄榄ier de Clisson; the grey walls are on the summit of a lofty rock overhanging the river. Near the castle are many ancient houses and an ancient Gothic bridge. The castle was besieged in the days of our Huguenots. It is now a ruin. Ploërmel is a port, feeding off the Aff, and is now fast decaying to fall. The town of Josselin is superior in appearance to Ploërmel. The church, which during the Revolution was converted into a stable and much injured, has been restored to its original purpose. It contains the mutilated tomb and effigy of De Clisson. There is another church in the town, half ruined. There is a 'penitentiary house' capable of receiving five hundred persons, designed for those who are desirous of returning for awhile to meditate upon their sins. Between Josselin and Aurec, the road passes through a beautiful wood, and there is a fine view of the forest of Clisson. Ploërmel lies between the rivers Auray and the Blavet. It contains the plantations and the coast-fishery, especially that of the sardine, which are very actively carried on. Linens, salt, better, cider, honey, wax, cattle, hides, tallow, and salt are exported.
the military census of 1829-29 who could read and write, was fourteen in the hundred, the average of France being that of a Frenchman.

In early times this department constituted the territory of the Veneti, by far the most powerful of the maritime states of this part of Gaul. Some portions along the border of the department may have belonged to the neighbouring nations, the Osamenti, the Curiosibis, the Redones, and the Nanetens. The Veneti possessed almost the only havens that offered a secure shelter along a considerable extent of coast, and this advantage, with their superior skill in maritime affairs, enabled them to acquire the sovereignty of the maritime traffic; regularly rendered them tributary. They used vessels of small draught of water, suited to the shallows which they had to navigate, and which took little damage when left aground by the meeting tides while the lofty stern and prow, and the general strength of their construction and equipment, enabled them to ride out the tempests to which they were exposed. In these vessels the Veneti carried on a trade with the British Islands and with other parts. Their towns in the name Narbo, which is on still retails of soils, moubt into the sea, surrounded by banks and shallows, which, being covered by the flood-tide, admitted of no assault by a land force, and, being left dry by the ebb, kept off the attacks of a hostile navy. Confiding in the extensive confidence they had in their own skill and in the advantages of their situation, they ventured to bid defiance to Cesar (n.c. 56). But the extraordinary genius and resources of the Roman general overcame all obstacles, and enabled him to achieve the reduction of the Veneti, as well as of Narbo, to dependability; a most important period (Coffin, pp. 7-16.) In the Roman division of Gaul, the Veneti were comprehended in the province of Lugdunensis Tertia. The town of Dauriorium, or as it is variously written, Dauriorium or Dauroritum, was the head and capital of the Veneti, and assumed, a little before the fall of the empire, the name of Veneti. It is represented by the modern Vannes, which has risen from its ruins; but it is probable that the site of the ancient town was two or three miles from Vannes, at a place called Dunauz.

The post of Blavia or Blavia, mentioned in the 'Notitia,' was probably at the mouth of the Blavet; the Port Vindana of Ptolomy was probably the gulf of Morbihan; and a Roman dock at the entrance has been commemorated by the town of Morlaix, in the region of this ancient section. The town of Blava, mentioned in the Theodosian or Peutinger Table, was probably at the junction of the little river Seul with the Blavet; and Duretum, which is mentioned in the same authority, was probably Rieux on the Vilaine. The Vilaine itself is called by Ptolomy the island of Houl, and the island of Houl-Houat were probably known as Vindinis and Siata.

In the middle ages this department formed part of Bre- tagne. [BRETAGNE.]每周 five [DRING.]

MORDAUNT, CHARLES, Earl of Peterborough, a nobleman famed for his romantic exploits in the war of the Spanish Succession, as well as for his lettered tastes and personal eccentricities, was the son of John lord Mordaunt, whom he succeeded in his title and estate. He was born in 1638. In his boyhood he served in the navy, but afterwards exchanged that profession for the army, and was present in 1650 at the siege of Tangier. He first obtained historical notice however by the decided part which he took in politics, during the fifteen years following his descent, the government of that king. Passing over to Holland, he attached himself to the Prince of Orange, upon whom he warmly urged the project of the expedition to England; and, on its success, was immediately created, in succession to his father, an English and Dutch Peer, and exchanged for that of Peterborough, as the heir of his uncle, second earl of the latter name. Of the questionable though comparatively unimportant share of the new earl in the political transactions of the reign of William III., a full account is given at the residence at Oxford of English and Dutch in his own time,' but it was only after the opening of the Spanish Succession war that he obtained a more creditable field of action, by his appointment, in 1705, to the command of a naval squadron and body of 5000 English and Dutch men of war. The Spanish powers then attempted to act on the coasts of Spain and Italy. Receiving on board his fleet at Lisbon the archduke Charles of Austria, claimant of the Spanish crown, he sailed to the eastern coast of the Peninsula, and

P. Co. No. 962.

entered on a career of daring and successful adventure unparalleled in modern warfare. The capture of Barletos, the reduction of Valence, and the gathering over all of the eastern parts of Spain to the cause of the archduke, were among the fruits of his brilliant successes; and there can be little doubt that, if his plans had been followed, Charles might have been seated, for a time at least, on the throne of that kingdom. But the conduct of Charles of Spain himself was intolerably overbearing and arrogant; and his real services, as well as his presumption, rendered him an object of envy and disgust to the archduke and the other allied commanders. When therefore at length Peterborough perceived that the prospect of a new stand was gone, he declared by his intention of quitting Spain, Charles showed an ungrateful readiness to be rid of him.

The remainder of his public life was chiefly passed in burying from one court to another, so that he was humourously said to have seen more kings and more positions than any man in Europe.' This spirit of locomotion however was anything but harmless: it engaged him in negotiations for which he had often no authority, and led him frequently to sow the seeds of intrigue, the more dangerous as they were supported by his singular talents, and were designed only to minister to a love of action and of personal display as reckless as his vanity was insatiable. In the struggle of parties, during the last days of Queen Anne, he was frequently implicated; he was elected to the House of Commons, and served there with the Tories, and received the order of the Garter and other dignities and offices. On the accession of George I. therefore, he had rendered himself too obnoxious to the Whigs to be employed in public business during their reign. The encounter of Peterborough with the Prince of Orange, which in 1735, was distinguished only by his affectionate intimacy with some of the most eminent literary men of his age—Pope, Swift, Prior, Atterbury, Berkeley, and others.—Gay, Tatler, and generous to profusion, and with a mind as full of care as of boldness, and neglect not least of all as a cultivator and ingenious expedient, and adventitious stratagem, Peterborough was equally fitted to dazzle in society and in the field. But, both for civil and military life, his qualities were more brilliant in the field; his services in the West Indies were the result of an inordinate passion for fame; and, in the gratification of this pursuit, his means were as unscrupulous as his appetite was greedy. With strong impulses of patriotic feeling, therefore, he has been regardless of his country's good, with the persuasions of a diplomatist, he wanted the dignity and consistency of a true statesman, and with undoubted genius for war, he displayed the qualities of an admirable partisan rather than those of a great general.

A lively sketch of the character of Peterborough will be found in Horace Walpole's 'Catalogue of Royal and Nobles Authors.' The political and military actions of his life are to be gathered from Burnet's 'History of his own Time,' from the 'Account of the Earl of Peterborough in Spain,' by a French physician, Dr. Freron; and from Captain Carlyon's 'Memoirs.' A full account of his whole career is contained in the modern compilation of the 'Lives of British Military Commanders.'

MORE, SIR THOMAS, born in Milk-street, London, in 1489, was the son of Sir John More, one of the justices of the court of King's Bench. He was educated at St. Anthony's School in Threadneedle-street, under Nicholas Hart, a person of some celebrity in his day, and about the year 1510, according to Holinshed, was made a fellow in the times, in the house of Cardinal Morton, archbishop of Canterbury, where he became known to Colet, dean of St. Paul's, who used to say, 'there was but one wit in England, and that was young Thomas More.'

In 1497 More entered at Oxford. He had rooms in St. Mary's Hall, but carried on his studies at Canterbury College (afterwards Christchurch). Here he studied Greek under Groyn, which was then publicly taught in the university, though not without great opposition. During his residence at Oxford he was frequently associated with Erasmus, who resided there during the greater part of 1497 and 1498, and formed an intimate friendship with More, which continued during the whole of his life. He was also at some time a member of the Oxford team, and composed, though deficient in harmony and ease of versification, are spoken of by Ben Jonson as some of the best in the English language.

After More left Oxford he prosecuted the study of the
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402

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law, first at New Inn, and afterwards at Lincoln's Inn, and some acquired celebrity for his legal knowledge. He was appointed reader at Furnivall's Inn, where he delivered lectures on the law for three years; and about the same time he also delivered lectures at St. Lawrence's Church in the Old Jewry, on the work of St. Augustin, 'De Civitate Dei', a kind of treatise on the science of thought out of taking orders; but he finally relinquished this intention, and was called to the bar, though at what time is uncertain.

More appears to have soon acquired an extensive practice. He was appointed one of the under-sheriffs of London, which at that time was an office of considerable importance, since the under-sheriff was judge of the sheriff's court, which then possessed far greater jurisdiction than it does at present. More was considered one of the most eloquent speakers of his day; and his reputation became so great towards the latter part of the reign of Henry VII, that it is said that there was no case of consequence before any court of law in which he was not engaged as counsel. About the same time he was elected one of the burgesses of parliament, in which he opposed a subsidy which had been demanded by Henry VII. for the marriage of his eldest daughter. In consequence of this opposition More incurred the displeasure of Henry VII., a prince who never forgot an injury, and not long after this, he was dismissed from his office. More had determined to leave the country. After the accession of Henry VIII., More was called upon to take a still more active part in public affairs. In 1514 and 1515 he was sent, in conjunction with Tunstall, master of arts, and afterwards bishop of Durham, on business of considerable importance. In 1516 he was made a privy-councillor, and received from Henry marks of the greatest favour. So great a favour had he become, that the king used frequently to come to his house unexpectedly that day with the queen.

About this time More composed his 'History of Richard the Third,' and his 'Utopia,' the work by which he is most known to modern readers. It is written in very good Latin, and was published first at Louvain in 1516, and afterwards at Antwerp in 1518. The object of this work is to delineate More's ideas of a perfect commonwealth, which is placed in the imaginary island of Utopia. The society which is supposed to exist in this island is constructed on the principle that no one in the state shall have a right to private property, since separate property is said to involve the unequal distribution of property, and thus occasions great suffering to those who are obliged to labour, and mental deprivation to those who live on the labour of others. It is difficult to determine whether the opinions expressed in the 'Utopia' are to be considered as More's real sentiments.

In 1519 More resigned his office of under-sheriff, and in 1521 he was knighted, and made treasurer of the Exchequer. He was also appointed envoy in various public missions to France and the Netherlands; and he bitterly complains to Erasmus, in many of his letters, of being obliged to leave his friends and his books to discharge what were to him the most disagreeable commissions.

In the parliament which met in 1523 More was chosen speaker, and in the discharge of his duties he offended Wolsey, who endeavoured to injure him in the king's opinion. Henry however still continued to show the greatest marks of favour to More, and, as a proof of his esteem, appointed him, in 1525, chancellor of the duchy of Lancaster. On the downfall of Wolsey, More was made chancellor, on the 25th October, 1529. He discharged the duties of his new office with the greatest industry and integrity, and was never accused by his bitterest enemies ofrupt exercise of power. The only charge ever brought against him was first promulgated by Fox, in his 'Martyrology,' and copied by Bunyan, in his 'History of the Reformers,' and by those who wrote, or were guilty of great cruelty in persecuting the Protestants; but even if this were true, it could not justly be brought as a serious charge against More's character in an age in which all parties that had the power persecuted their opponents. But we have, on the contrary, the testimony of Erasmus, that 'whilst More was chancellor no man was put to death for those pestilent dogmas,' which is confirmed by More's own express declaration in his 'Apology,' published in 1533, after his downfall from power, when he was surrounded by enemies, and his assertions, if false, could have been easily contradicted.

More continued chancellor till the 16th May, 1532. Henry had doubtless advanced More to the chancellorship with the hope that he would assist him in his divorce, and marriage with Anne Boleyn, and therefore pressed him strongly to his opinions on the subject of marriage, sincerely attached to the Roman Catholic Church; he looked with a certain degree of horror upon a project which was denounced by the supreme head of the Church, and therefore begged Henry to excuse him from giving an opinion on the subject. The emperor's ambassador, Mendoza, assured Erasmus that Henry had determined to effect the divorce, and would soon require the active co-operation of his chancellor. More asked and obtained permission to retire from the office.

From this time Henry, who never seems to have selected any former friend when his purposes were in the least degree thwarted, appears to have resolved upon the destruction of his old favourite. More was originally a supporter of Elizabeth Barton and her accomplices; but his innuendo in this case was so clear, that his name was afterwards omitted. The court party however soon found an opportunity of gratifying their vindictive master. By a law passed in the session of March, 1533, it was enacted, "no act, or act, to do anything to the prejudice, &c. of the king's lawful marriage with Queen Anne; and it was also provided that all persons should take an oath to maintain the whole contents of the statute. At the end of the session of 1533-4, More was summoned before the court, on the 14th April, 1534, More was summoned before them to take the oath. This More declined doing, but at the same time offered to swear that he would maintain the order of succession to the throne as established by parliament. In consequence of his refusal to take the oath, More was committed to the Tower; and in the same year two statutes were passed to attain More and Fisher [Vinhay] of imprisonment for treason, with the punishment of imprisonment and the loss of goods. More remained in prison during thirteen months, during which time it is likely he induced him to take the oath and also to subscribe to the king's ecclesiastical supremacy; but as he refused to do so, he was, at the end of that time, brought to trial for high treason. He was tried for high treason, and condemned to death. He was beheaded on the 6th of July, 1535, and met his fate with intrepidity and even cheerfulness.

More's character was singularly faultless. His sweetness of temper and amiable disposition are frequently mentioned by his friends. He was so much loved by the people, as to be more justly considered the true exponent of the Christian religion. All his inhabitants, male and female, applied their leisure to liberal studies and profitable reading, though piety was their first care. No wrangling, no angry word, was heard in it; no one was small; every one did his duty and performed it with extreme cheerfulness. (Translated by Sir J. Mackintosh, in Life of Sir T. More, p. 15.) More was married twice; first to Jane Colt, the daughter of a gentleman of Erasmus, and secondly to Alice Middleton, a widow several years older than himself. The last male descendant of Sir T. More was Thomas More, a Jesuit, who was principal of the College of Jesus at Bruges, and died at Bath in 1795. The English works of Sir T. More were collected and published at London in 1557, and his Latin works at Louvain in 1566. His letters to Erasmus are printed in the collection of Erasmus's letters published at London, 1642. His 'Utopia' has been translated into English by Robinson.
Hannah was from the beginning the most remarkable of the group. She wrote verse at a very early age, and in 1783 she published a pastoral drama, which was entitled 'The Sea and the Land', and which was so well received that the next year she published a regular tragedy in the story of Rolulus, and two Tales, in verse, and her turn then being thought of by her friends to incline to the drama, mean, were taken to obtain an introduction for her to Garrick, by whom she was very late. This acquaintance of Dr. Johnson, Burke, Sir Joshua Reynolds, and other persons who at that time formed what was considered the best literary society of London. During this period of her life she was in full. This approach of her to the world was the means she produced her 'Sacred Drama', a publication more favourably received perhaps than her former works. By the year 1786, when she was full forty years of age, she had effected her plan for retiring into the country, and having purchased a house in the neighborhood of the former residence of the late Mrs. Siddons, in Somersetshire, in which she had been best known in her youth, and there the rest of her long life was passed in circumstances made easy by the profits of her various publications, which were considerable, and in the enjoyment of the services which arise from literary exertion, and from efforts to raise the condition, by means of education, of the labouring population.

We cannot undertake to enumerate all the publications of Miss Morrison in this the larger of the two parts into which her life was divided, and which is taken in the condition of the majority of them. The work in which the serious turn which her mind had taken first manifested itself was her 'Thoughts on the Manners of the Great,' 1789; which was followed in 1791 by her 'Essays on the Religion of the Fashionable World.' In 1799 appeared the appearance of her 'Letters on the Modern System of Female Education.' Not long after the appearance of this work there was an intention, which Porson, then bishop of London, is supposed to have greatly encouraged, of commissioning her to publish the life and character of the Princess Charlotte of Wales. This however was not effected, but it led to the publication of her 'Hints towards forming the Character of a young Princess,' 1805. Then came what has perhaps been her most popular work, 'Celia's in Search of a Husband,' as a novel. As a writer of moral and imaginative poetry, she was held in the highest estimation, and in which we find fully displayed the kind of character which, to the mind of Miss More, it appears desirable that our young countrywomen should possess. In 1811 her 'Practical Piety' appeared; in 1814 she published her 'Moral and Religious Principles of the Church of England.' She continued to live in the school at Upton for many years the most flourishing establishment of the kind in the west of England.
forming the southern part of Greece, and united to the mainland by the isthmus of Corinth. Its shape has been compared to that of a mulberry leaf, and its coast, being deeply indented by numerous gulfs and inlets, forms a multitude of small peninsulas and promontories. It is bounded on the north by the gulfs of Lepanto and Patras, on the west by the sea of Cephalonia and Zante, and farther south by the gulf of Arcadia, on the south by the Messenian and Laconic gulfs, and on the east by the gulfs of Nauplia and Argos, which latter divides Morea from Attica. The greatest length of Morea from the point of Drepanum on the straits of Lepanto, to Cape Matapan, its most southern promontory, is 140 miles, and its greatest breadth, from the coast opposite Zante to the easternmost point of the coast near Poros, is about 125 miles, but the breadth is much less in other parts. Its area has been vaguely estimated at 8800 English square miles (Thiersch, *Etat actuel de la Grece*), but it probably exceeds considerably 9000 miles.

The centre of Morea is an elevated table-land traversed by numerous ridges of hills, which enclose spacious basins, some of them like craters, being so surrounded by mountains, that the water at the bottom, being unable to find a visible outlet, forms marshes and small lakes, some of which are fertilized by the subterranean springs. The surface of the land has been compared to a number of saucers with snipped borders placed by the side of each other on a table. This is especially the case in the eastern part of the table-land; but, at the opposite extremity, a low belt of country, rising slowly from the sea and sloping westward, following the course of the Alpheus and its tributaries, until they merge into the low maritime plains of Elis. Towards the south the long valley of the Eurotas slopes down to the coast between two low hills, in which direction the whole eastern highland, and, projecting into the sea, form the promontories of Malea and Tamariz. Westward of the valley of the Eurotas is the valley of the Pamisus, in Messenia, running likewise from north to south between the ridges of the Taygetus on the east and Mount Aegaleon on the west.

On the north side the table-land of Morea is separated from the maritime district of Achaea by a range of mountains known to the antients by the names of Erymanthus, Laconia, and Arcadia. The highest part of this range, which is termed the eastern mountains of Greece, is about the level part of the isthmus of Corinth, where the town of that name was built. To the eastward a chain of mountains, detaching itself from the central high land, runs through the peninsula of Argolis, which stretches far into the sea between the two mouths of the Argolic gulf. This chain is the plain of Argos, watered by the Inachus. Farther south a narrow strip of land extends between the central high land and the sea, along the western coast of the Argolic gulf. The slope of the table-land here is more abrupt than in the eastern side of Morea. For a further description of the surface of the country, see *Achaea, Arcadia, Argolis, Elis, Laconica, and Messenia*.

The highest summits of Morea, Taygetus in the south and Cyllene in the north, are more than 5000 feet; snow remains on the highest points of the Taygetus till the month of June. The table-land of Arcadia is often covered with snow in March, while the maritime districts enjoy warm and genial weather. The perennial rivers of Morea are the Alpheus, Eurotas, Pamisus, and Peneus; the other numerous streams along the northern and eastern coasts are dry, or nearly so, in summer, but form rapid torrents in the winter. The atmosphere of Morea is generally pure, the landscape beautiful, and the ground fertile. The low plains of the three principal valleys afford good pasture, and although the forests have been sadly wasted, still many parts of the mountains are covered with fine pines and oak trees. The country, imperfectly cultivated as it is, produces corn of various kinds, wine, oil, flax, cotton, beeswax, leather, and wool; vegetables and herbage; and grazing for sheep. There are no roads, properly speaking, through the peninsula, but only tracks for horses, and some narrow Turkish causeways through the low grounds. The principal towns are—Patras, on the north coast; Gavont, Arkadia, Navarino, and Modon, on the west coast; Koron and Kalamata, on the south coast; Monemvasia, Nauplia, and Argos, besides the islands of Spezian, Hydra, and Poros, on the east coast; and the towns of Mivra, Tripolitia, Kari- tena, Kalavrita, and Andritsena, in the interior. For the actual history of Morea, *Greece, Kingdom of*.

The antient history of Peloponnesus forms part of the history of Greece. After the destruction of the Achaean league by the Romans, a.C. 146, the peninsula formed part of the Roman province of Achaea. It remained subject to Rome till the division of the empire. It afterwards belonged to the Eastern or Byzantine emperors till the beginning of the thirteenth century, when the Latins or Franks having conquered Constantinople, the Venetians obtained for their share several islands of Greece and a considerable part of the Morea, and the Franks seized Argos, Nauplia, Corinth, &c. It was then that they gave the peninsula the name of Morea, from the quantity of mulberries ('more' in Italian) which it produces.

Towards the end of the fifteenth century the Morea was conquered by the Turks, and in 1530 the Vassal powerful Venetians were expelled from it. In 1664, war having broken out between Venice and the Porte, the Venetians sent an armament, which conquered the peninsula [Morea], to which they gave the name of a kingdom, subject to Venice, and its long continued being thus called is owing to the fact that it was joined in the general revolt of the Greeks, and, after a long struggle, the battle of Navarino (1829) delivered the Morea from the yoke of the Ottomans. The Morea forms now an essential part of the free Greek states.

*Corinthe, Memorie Storiche e Geografiche del Regno di Morea; Leake, Travels in Morea, an excellent description of the country; Sir William Gell's *Morea*.*

MOREAU, JEAN VICTOR, a general who rose to celebrity by his participation in the French revolution, was born at Moreau in Brittany, of highly respectable parents, who designed him for the legal profession. But at the age of eighteen years, he had conceived such a passion for military service, that he enlisted as a private soldier; and though his father did not expressly disapprove of his son's course, yet, when he came to law at Rennes, where he soon made himself conspicuous and popular in defending the privileges of the provincial parliament against the government, he never cordially followed this profession. When therefore the Revolution burst out, his father desired him to return to his law at Rennes, where he soon made himself conspicuous and popular in defending the privileges of the provincial parliament against the government, he never cordially followed this profession. 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paig of 1779; so disastrous to the French, and also to the Rhine, which he was recalled to oppose the Austrians.

On Bonaparte's return from Egypt, Moreau professed and rendered him his services in effecting the revolution of the 15th of Brumaire, and almost immediately afterwards received the command of the armies of the Rhine; at whose head, at the close of the year 1800, he won from the Austrians the sanguinary and decisive battle of Hohenlinden. The first consul loaded him, on his return to Paris, with eulogy: but Bonaparte and Moreau were each too eager on the same career of ambition to pursue it without dangerous collision. Bonaparte affected to speak of the victor of Hohenlinden as 'the retiring general'; Moreau retaliated with bitter justice by terming the first consul 'a general at ten thousand men a day.' And when he was invited to become a member of Napoleon's new Legion of honour, he openly refused, with the contemptuous sarcasm—'The fool! does he not know that I have been enrolled in the ranks of honour these twelve years?'

But the impatient spirit of Moreau was no match for the ascendant genius and fortune of his rival; and the beginning of 1804 a charge which pretended to implicate him in the royalist conspiracy of Pichegru and Georges Cadou-
dal was sufficient to decide his fate. He was condemned, without a shadow of evidence, to two years' imprisonment for two years' imprisonment, by his own request, as punishment. He retired to America, where he lived tranquilly, with his wife and child, for several years, until, in an evil hour for his fame and his fortunes, he accepted, in 1813, a generalship in the Emperor Napoleon's armies, and stood in the allied armies by his counsels against his country. He had scarcely arrayed himself in their ranks when he was mortally wounded at the battle of Dresden, and died in a few days, after bearing the amputation of both legs without a groan.

The admirable retreat through the Black Forest and the brilliant campaign of Hohenlinden must ever be sufficient to place Moreau among the ablest commanders of a period which produced every variety of military talent. He will be perhaps sedulously remembered, not once active and very, than as a general of very daring and surprising genius. His mental qualities in other respects partook of the same characteristics; and he wanted the necessary decision to cope with the energy of his great rival, as much as he lacked the patience and calculation necessary to conceal his own ambition and envy under the shallow pretext of opposing a republican virtue to the despotism projects of the First Consul. In person Moreau has been described to us as rather under the middle height, and of dark complexion; his manners were amiable and liberal; and he was well known to have been attempted by those who suppose that he might have identified the cause of the allies with that of French liberty, and who forget that he had never been a royalist; that if he had any political principles, he was prejudiced in favor of a republican; that he could have no dreams of democratic freedom to indulge for his country in the camp of the allied sovereigns; and finally, that he had pledged himself to afford his aid in shedding the blood of his fellow-countrymen and ancient companions in arms. What singular change must have taken place in the character, when company he had formerly sought under the tricoloured flag, and whom he now found in the Russian service, 'has brought you and me together under the banners of the Czar?' 'Singulier il doubtiss est,' answered Jomini; 'but there is this difference between us—that I am not a Frenchman.'

MOREL is an edible fungus, called by botanists Morchella esculenta. It springs up in orchards, woods, and under-bushes, early in the spring and summer, and seems to be the same species as those found in the English woods, though this country is said to produce them. In Spain, the country people in Germany are so persuaded of this, that they formerly set fire to woods in order to obtain a crop of morels, of which they are very fond: at last the practice was put down by law. This fungus has a stalk from one to three inches long, and a spherical cap, from the size of a pigeon's egg to that of a swan's, hollow, pale brown or even grey, and deeply pitted all over its surface, the depressions being separated by raised anastomosing lines. The plant has a slight smell and an agreeable taste, and is employed for various purposes of cooking, both fresh and dried. In the former state it is most commonly stewed or stuffed with forcemeat; in the latter it is employed as an ingredient in sauces. In this country it is of rather rare occurrence.

MORELLES. [MEXICAN STATES.] MORRELL, THOMAS, born at Eton in 1783, studied first at Eton College, then at Cambridge, where he became a fellow of King's College, and in 1743 took his degree of D.D. He was a distinguished classical scholar; he edited several tragedies and Epics, and made English translations of the 'Prometheus' of the former, and of the 'Hecuba' of the latter. He also edited improved editions of the Greek Lexicon of Hederick, and of Ainsworth's Latin Dictionary. His other works include 'The Thesaurus Gracie Poeseos, seu Latinae temporis words of, 2, 'Annotat'ioons on Locke's Essay on the Human Understanding; 8vo, 1793; 3, 'A Sermon on the Death of Queen Caroline, by George II.' 8vo, 1753, and other Sermons. Morrell died in 1784.

MORENA, SIERRA. [SPAIN.] MORELO, LOUIS, born in Providence in 1643, studied at Aix and Lyon, and became doctor of Canon Law. He compiled the Universal Dictionary, biographical and geographical; for the accomplishment of which he had collected a considerable stock of literary information. He knew several languages, and was assisted by several personal friends and correspondents. He published a dictionary in 1673, in one vol., 'Grand Dictionnaire Historique et Critique de Louis Moreri.' Although its contents are miscellaneous, the biographical part, both in respect of quality and execution, exceeds the rest. Moreri's Dictionary may be considered as having outstripped all other ideas of subsequent biographical dictionaries. Moreri undertook a new and enlarged edition of his Dictionary, of which he published the first volume, but the second was not entirely printed when the author died in 1689. His constant application to death.

Numerous editions of his Dictionary, considerably altered, revised, and enlarged by several editors, among others by Leclerc and Bayle, have appeared; the last is that of Paris, 1729, in 10 vols. fol. Notwithstanding its many imperfections, Moreri's Dictionary is still a useful work; the genealogical articles are the most complete; the geographical are the most defective. Moreri published also 'Réclations Nouvelles du Levant, ou Traité de la Religion, du Gouvernement, et des Coutumes des Perses, Arméniens, et Gaur, composées par le P. G. D. C. C. (Père Gabriel du Chalon Capucin).

MORETON HAMPSTEAD. [DEVONSHIRE.] MORRAGGI, GIOVANNI BATTISTA, was born at Forli in 1689, and educated at Bologna; he became prof. at Bertin and Valvasa, and in 1701 obtained his doctor's degree. He afterwards went to Venice and Padua, to study chemistry and natural philosophy, and in 1715 he was appointed chief professor of anatomy in the University of Padua. He died in 1771, having been elected a member of all the chief scientific societies in Europe, and having received the highest honours from the contemporary popes and the sovereigns of adjacent nations.

Morgagni's chief works are, 'Adversaria Anatomica prima,' Romagn, 1761, 8vo, 4to, in which he describes the 'Biblia Anatomica,' ii. 34) says there is scarcely anything which is not new, or at least more clearly described than it had been previously. Five similar collections of miscellaneous observations were afterwards published under similar titles, and in 1719 they were all printed at Padua—amounting altogether to twenty, which were published together at Venice in 1762. He edited also the life and works of Valvasa, his former preceptor and friend, whose opinions he constantly and warmly maintained. But Mor-

gagni's most celebrated work was that which he first published in his eightieth year, 'De Sedibus et Causis Morborum per Anatomiam Indagatis,' Venice, 1761, in 2 vols. folio, which contains records of an immense number of observations on morbid anatomy, and which conferred nearly as great benefit on pathology as those which it was the object of Halbert conferred on physiology. It has been since frequently reprinted and translated, and is still a standard work of reference.

MORGARTEN. [Zoo.]
Morillo

During the reign of Charles V, the Moriscos enjoyed comparative tranquility. The attention of that monarch was too much absorbed by the foreign wars in which Spain was at the time engaged, to give him leisure to meditate reforms of internal policy. After the death of the regent Philip II, his son and successor, the forced conversions had again to encounter the most violent persecution. It was suggested that as long as the Moriscos preserved their manners, dress, and language, different from the Spanish, their conversion would not be required by the crown. The Moriscos, however, determined to adopt the Spanish dress; that all their baths should be pulled down, that their wives should walk the streets unveiled; and that the men themselves should forsake their Arabic names and surnames, and call themselves after some saint of the Roman calendar, in the Christian fashion.

This outrageous injustice and violation of every right which is dear to man again drove the Moriscos to despair and resistance. They rose in the Alpujarras and clamored for the suspension of the exactions in the province of Umayyad; and the rebellion, which lasted more than five years, was only put down by the talents and abilities of John of Austria (1570). As a punishment for their revolt, the baptized infidels were transported from Andalusia to the coasts of Africa, and dispersed among the African family of Umeyyad; and the only remnant, in 1609, was only 3000.

The history of the Moriscos, who were the descendants of the Moors, is inseparable from the history of Spain. They were more closely watched; they were subjected to all sorts of humiliation and indignities, and it was only in 1610, under Philip III, and during the administration of his favourite, the Duke of Lerma, that the Moriscos, to the number of about 300,000, others say one million (not to mention such as, by assuming the disguise of Christians, spread themselves throughout the country), were free of constraint, and could engage in their usual pursuits. They were, however, a persecuted people, and their sufferings were only mitigated by the fact that they were allowed to retain their religion and language. The Moriscos were, however, more numerous than the Moors, and may be partly attributed to the banishment of so large a part of the industrious population.

Literature.—It cannot be supposed that the descendants of a people who had been the passionate lovers of science and learning, and who had enjoyed comparative freedom and the protection of the crown, would be destitute of books and written and circulated among them; and the more so, as the majority of them were educated in the religious and literary institutions of Spain. The Moriscos, therefore, were the inheritors of the literary treasures of Spain. The Moriscos were, however, a persecuted people, and their sufferings were only mitigated by the fact that they were allowed to retain their religion and language. The Moriscos were, however, more numerous than the Moors, and may be partly attributed to the banishment of so large a part of the industrious population.

We are told that the libraries of the Escorial and of the Monastery of Morelia contain upwards of a hundred of these manuscripts, which are said to exist in other public libraries of Lycia, and also in the Arabic manuscripts, owing to the circumstance of their being written in the same character. Their contents are poems, chiefly of a religious history, and traditions in prose of Cordova, Granada, Seville, and of other parts of Spain, such as they were under the sway of the Moors; books on religion and law; translations into Spanish of Kórko and other works; and collections of recipes for all diseases. The manuscripts were written in Spanish, but with the same hardness and ingenuity that was observed in the Moriscos, who were the descendants of the Moors, and may be partly attributed to the banishment of so large a part of the industrious population.

Many reasons influenced the Moriscos to adopt the foreign language, using their own characters; principally, that sort of superstitious reverence which Eastern people have for their letters; it being well known that the Syrian Jews used their own characters -
Arabic, and that the Jews of our days write Portuguese and German with their own letters; 2ndly, the respect in which Arabic characters are held by all Mohammedans, owing to the Korân being written in them; and Jedly, the wish to conceal from the eyes of monks and inquisitors their prayers and tracts concerning the Mohammedan religion, in which they persevered notwithstanding their outward show of Christianity. It is likely also that books were written in this dialect for fear that Arabic would not be understood by the people for whom they were designed; since it is well known that, owing to their long stay among the Christians, and to orders prohibiting them from conversing in Arabic, the Moriscos at first corrupted their language, and finished by entirely forgetting their native tongue, for which they substituted a mixture of Spanish and Arabic. The union in the 17th century was made in the 1650s, when only two brothers and a few more, to a certain part in Sussex, upon an appointed day, where they were promised support and letters. The number of Morisco inhabitants was considerable—possibly 10,000 at first landing, and 2000 horse within one day after. This plot was discussed in Thurloe's office, when Morland was at his desk apparently asleep: Welwood says that Cromwell, when he saw him, drew his sword, and was only dissuaded from despatching him on the spot by the earnest solicitation of Thurloe, who assured him that Morland had sat up two nights together, and was certainly fast asleep. Disgusted at this proceeding, Morland immediately determined to divulge the plot to the king, which he did by means of a letter from Sir John Hemsley to Lord Treasurer. The king, being thus cautioned, answered, that 'he could not be ready so soon as the appointed day,' which gave the three projectors some apprehension and suspicion of the discovery. Not being satisfied however with this answer, the king contrived a colonel's order 'to use expedition, and not lose so fair an opportunity for his happy restoration.' The king answered, that he was not very well, or something that appeared so frivolous, that they feared their whole project was discovered, and will not be suspected. Under these circumstances Willis sent for Morland, who went, not considering it safe to decline the meeting, but took two pistols with him. At the appointed place, he was watched by another person, by whom he was conducted with the utmost caution into a dark deep cellar, where, by the light of a candle, he saw Sir Richard by himself with a Bible before him. Sir Richard told him plainly that 'he had sent for him on account of the discovery of a secret of the highest importance, which could not possibly be known to more than three persons beside himself.' Then, recounting the particulars, he laid his hand upon the Bible, and solemnly swore that he had not been the discoverer, and requested him to do the same. Morland told him, 'it was not worth while to give him a reason why he should suspect him.' All this he did with such a remarkable presence of mind, that Willis was completely damped, and Morland escaped from further interrogation. In May, 1660, he went to the king at Breda, in Holland, who received him kindly, made him a knight, and soon afterwards a baronet.

Morland, in his 'History of England,' produces a letter from Sir Samuel to Willis, dated March 10, 1660, in which he expressly denies the whole of the above statement; but Morland's own testimony in his autobiography is to the contrary: if he did write it at all, it was probably intended merely as a means of safety from the wrath of Sir Richard Willis.

On the restoration of Charles he was made master of mechanics to his majesty, also presented him with a medal as an honourable badge of his signal loyalty. He was soon afterwards made a gentleman of his majesty's privy-chamber.

In 1677 he took a lease of a house at Vauxhall, for twenty-one years, from the heirs of Jane Vaux, the daughter of Guy Vaux, of gunpowder celebrity. This house was situated where Vauxhall Gardens now are. Two years afterwards, he had a pension of 400l. settled upon him, but the king having some apprehensions concerning his raised, obliged him to dispose of it. He afterwards removed to a house at Hammersmith, near the water-side, where he died, December 30, 1695, and was buried in Hammersmith chapel on January 6 of the following year. The three last years of his life were spent very wretchedly. Poverty and loss of sight compelled him to rely almost solely on the charity of archbishop Tenison. In a letter dated March 5, 1694, he returns thanks for his kindness, 'which was far greater,' says Sir Samuel, 'than such a poor wretch as..."
I could ever hope for.' This letter, written when he was blind, is a very curious relic, and is now preserved in the library at Lambeth Palace. John Evelyn, in his Diary, gives an interesting description of him when suffering under this accumulated load of misfortunes: — 22nd Oct., 1655. The archbishop and myself went to Hammersmith to visit Sir Samuel Morland, who was entirely blind, a very mortifying sight. He showed us his invention of writing, which was very ingenious, also his wooden calendar, which instructed him all by feeling, and other pretty and useful inventions of mills, pumps, &c., and the pump he had erected, that conveyed water to his garden, and to passengers, with an inscription, and brings from a filthy part of the Thames, near it, a most perfect and pure water. He had newly buried 2000 worth of music-books, being, as he said, love songs and vassals. He played his harpsichord with the inscription, and thus proceeded:—The inscription which Evelyn refers to was on a stone tablet fixed in the wall, and is still preserved; the following is a copy of it: — Sir Samuel Morland's well, the use of which he freely gives to all persons: — to hold, to be sold for more money, and to submit to your own judgement in all things. Pells, in another place, informs us that two sheets of the work were actually printed.

It was about this period that he invented his mathematical machine, which he makes mention of in a letter dated May 2, 1666. He noted, however, that he had not however published it in 1673, when, 'by the importunity of his very good friends,' it was made public. The little work in which it is described is illustrated with twelve plates, in which the different parts of the machine are exhibited. The means of dividing plates and small indices, movable with a steel pin. By these means the four fundamental rules of arithmetic are very readily worked, and, to use the author's own words, 'without charging the memory, disturbing the mind, or exposing the operations to any accidents.' His 'Perpetual Almanac' is given at the end, which was often printed separately. One copy of Morland's little book, now in the possession of Professor Davies of Woolwich, contains a very beautiful portrait of the author, but, with this exception, we have no other example of his handwriting.

We are indebted to Morland for the speaking-trumpet in its present form, an account of which useful instrument he published at London in 1701, under the title of "A Description of the Alphonicke, or speaking trumpet, which she uses as well as sea and land." In this rare tract, consisting of eight leaves, he gives an account of the various experiments that he made before his instrument attained a certain degree of perfection. The first trumpet that he constructed, "so large as the barrel of a two-pronged garden fork," before digested in my thoughts, was made in glass in the year 1760, being about 2 feet 8 inches in length, the diameter of the greater end 11 inches, and that of the other end 24 inches; — with this, he says, 'I was heard speaking at a considerable distance by several persons, and found that it did very considerably multiply the voice. After giving a description of some experiments with other trumpets, he enters into a philosophic disquisition on the nature of sound, and the best form of the speaking-trumpet, which he leaves doubtful, and concludes with an account of the manifold uses of his instrument, which are very excessively exaggerated: He appears also to have overset the power of his trumpet; for, in his "Utrum of the instrument," he says that he has no doubt but that it might be improved to carry 2000 voices for the distance of ten miles. A French translation of Morland's treatise was published at London in 1761; and, in an advertisement prefixed, it is stated that Morland's tubes were sold by Moses P. Fuller, bookseller in St. Paul's Churchyard, at the price of 2s. 4d. This invention excited much general interest at the time; so Butler makes Hudibras say:

'T was heard a formidable voice.
Loud as the Stentor's pipe.

There is one of Morland's original trumpets, now preserved at Pembroke College, Cambridge, the exact size of which he has observed that it is in bad condition, and no one knew what it was till very lately, when it was identified by a member of the college.

All former biographers have asserted that he invented the speaking-trumpet in 1662; but I think the date is much inferior than an inventor of that machine. As early as 1590, Cyprian Lucar, in his treatise named "Lucar-Solacius," gives a description of a rude fire-engine, which he designated by the name of a squirt, and which acted precisely on the principle of Morland's instrument. Even before Morland's fire-engine invented by Greatorex in 1656, which was ten years before he saw the "quench-fires" of Sir Samuel.

The principal objects of Sir Samuel's study were water-engines, pumps, &c., which he carried to a high degree of perfection. His "Description of the Water-engine" invented by Greatorex in 1656, which was ten years before he saw the "quench-fires" of Sir Samuel.

The object of most of his various models of engines, besides tables of square and cube roots: from the close of Joseph Morland's profane, it appears that many of his father's works were left unpublished. There is also a description of his steam-engine, the "New Water-engine," by Ched. Morland in 1662, and presented to his most Christian Majesty, 1653,' and these principles are explained as follows:—

'Water being converted into vapour by the force of fire, the vapour of water requires a larger space (about three times) than the water before occupied, and, rather than be constantly confused, would split a cannon. But being duly regulated according to the rules of statics, and by science reduced to measure, weight, and balance, then they bear their load peaceably like good horses, and thus become of great use to mankind, particularly for raising water, according to the following table, which shows the number of pounds that may be raised 1800 times per hour to a height of six inches by cylinders half filled with water. As well as to the most perfect diameter of cylinders: then follows the table of the effects of different sized cylinders. This evidently indicates a perfect knowledge of the subject, and, to his great credit also, let it be forgotten that he forgets to mention the exact volume which water occupies in a state of vapour, which must have been the result of experiment: his researches however seem to have had little influence on the progress of the practical application of steam.
MOR 409

erroneous. Another tract by him, consisting of four leaves, and entitled 'The Count of Pagan's Method of Delineating all manner of Fortifications (Regular and Irregular) from the original of which many are derived, both in modern and ancient times,' was published in 1762, in Venn's 'Military and Martial Discipline.' The 'Urim of Conscience' was written during his blindness, and is a very singular piece of composition: it contains reflections on the falsity of the claims to immortality at which his religious convictions uttered of life. By one of his letters to Archbishop Tenison, dated 28th of July, 1688, and preserved in the archiepiscopal library at Lambeth, it appears that he once had an intention of publishing the first six books of Euclid for the use of public schools.

Morland is said to have written a treatise on the barometer, which was answered by Lord North in another tract on the same subject. He is also said to have invented the expiant to heave up anchors, but he must be considered rather an improver than the inventor of that machine: the same remark will apply to various other performances, which have elsewhere been ascribed to him.

In the library at Lambeth Palace is an autograph of Sir Samuel Morland, on which he wrote in the latter part of his life, together with several other letters and papers: it is from this original source that we have here given several particulars never before published. We have also made use of the biography of Sir Samuel in Chalmers's 'Biographical Dictionary,' in which he is thus described: 'graphy, considering that he had no foundation to rest on; as also of a separate account of his life, writings, and inventions, by J. O. Halliwell, Esq., which was published at Cambridge a short time since.

BENJAMIN MORSE, was the son of Henry Robert Morland, an indifferent painter, from whom he received his first instructions, but very soon surpassed his master. He first painted landscapes and one or two small conversation pieces: his favourite subjects however were domestic animals, and birds in their natural haunts, which he executed in a masterly manner. In the exhibition of the Royal Academy in 1791 he had a picture representing the interior of a stable, with horses, draymen, &c., larger than a half-length: it is an excellent performance in the favourite art, and was considered as the masterpiece of his masterpiece. Morland was a perfect master of the mechanism of the art. With a correct eye for effect, he observed and executed with equal rapidity; and though without imagination, rendered his subjects interesting by faithful expression of their essential character and picturesque arrangement. Edwards regrets that 'his low and vulgar propensities led him into society ill calculated to improve his mind or manners.' But Fuseli says, 'It is surely one of the favourite paradoxes of the age to wonder at the association of Mr. Morland with gentlemen of the world, who were cognizant of his favourite objects of study. It would be a disgusting idea, if it were a possible one, that the man who, with congenial satisfaction, spends the day in pencilling, to a degree of deception, a sow amid her litter, could long for the recreation of elegant society in the evening.' Morland was born in 1764, and died in 1804, at the early age of 40.

MORLEY, THOMAS, one of the most distinguished of our early composers, and author of the first regular treatise on the art of music that appeared in the English language, was born probably about the middle of the sixteenth century, but the exact time is unknown; indeed, our information concerning him is remarkably scanty, the celebrity of his works being considered. All that is known of this eminent musician is, that he died in 1588, when he was admitted into Corpus Christi College, in Oxford, with his Athene Oxonienses, tells us that he was a disciple of Birde, to whom he dedicated his book in very reverential and affectionate terms; that he obtained a bachelor's degree in 1588, and was sworn into his place as gentleman of the royal chamber in 1593. He died, Dr. Burney supposes, in or near the year 1604.

Morley produced many compositions that are still well known, among which are, canzonets of different kinds, particularly for two voices, madrigals for five voices, and services and anthems of the usual size, which were published in the tune Funeral Service published in Dr. Boyce's collection, the first that was set to the words of our reformed Liturgy. He also published Consort Lessons, made by diverse expert authors, for six different instruments, published at London, 1661, 1674, 1699. He also published, Citterne, Bass-viol, Flute, and Treble-viol, 2nd edition, 1611. He likewise collected and edited that collected so familiar to madrigalists, The Triumphs of Orion, P. C. No. 963.

1601. In Queen Elizabeth's Virginall Book are five sets of lessons by Morley. But the work on which his fame is chiefly built is that alluded to above, A Plaine and Easy Introduction to Musick, for about 1557. It continued in use above a century and a half, and is still read and esteemed by most well educated musicians; for though it contains much that is become obsolete, and the language has all the quaintness, amounting often to obscurity, of the period it was written in, yet its general subject, the art of making music, is of the subject, great acumen, a bold spirit, and much curious learning. It was translated into the German language by John Caspar Trost, a profound musician of the 17th century; and the scientific Florentine patrician, Doni, mentions the name of Morley with approbation. Morley obtained of Queen Elizabeth an exclusive patent for the printing of music, under which William Barley published most of the music books that appeared during its continuance. This was granted in 1598, in lieu most probably of some bounty which he had been forborne from the pry-purse of the discerning but parsonial queen.

Hawkins and Burney, it has truly been remarked, have in their histories failed to do justice to the compositions of Morley: indeed each of these writers himself was born with himself in criticiising the productions of one of the earliest and greatest of our musicians. Neither has selected as specimens of his works the most original and agreeable of his many compositions. But in Burney's History, Hawkins had a taste for what is now thought uncouth, and that Burney's prejudice against the early English masters occasionally blinded his judgment.


MORMOPS, Dr. Leach's name for a genus of Vesperilionidae, [Chiroptera, vol. ii., p. 24.]

MORNINGTON, GARRET, EARL OF, whose claim to be numbered and ranked high among the composers of the British Isles is, nevertheless, one of the county of Meath in or about the year 1720, and advanced from the dignity of an Irish baron, which he inherited, to that of an earl, in 1780. Devoting much of his time to his art, his life has been quite domestic and devoid of those incidents which contribute so largely to the page of biography; but success of a very decided kind attended his chief pursuit, and 'small indeed,' it has truly been said, 'is the number of professors who, by their works, have arrived at the same rank in the art as that so fairly gained and so incontestably possessed by the noble earl.'

All that we know of the early history of this distinguished nobleman is from a paper printed among the Miscellanies of the Honourable James Barrington, noble son to the famous actor, who, with the assistance of his earl's father played tolerably well on the violin, and by his performance delighted the baby while yet in the nurse's arms. But even at that infantile period he seemed to be capable of distinguishing the difference between the noble and excellent; for during a celebrated violinist, being on a visit at the family seat, the child would not permit him to take the violin from his father, till his little hands were held; but having heard the professor, he did his utmost to prevent the return of the instrument to his father. Nearly at the same age he could last time to every piece of music, and the most sudden changes in the measure were immediately perceived and followed by him. From aber infancy he never attempted to perform on any instrument till able to play the second part in Corelli's sonatas. Shortly after he attempted composition, and achieved a minuet, which however evinced more enterprise than genius. At fourteen he discarded the violin for the harpsichord. About that time his father created a title for his son that he should at once be appointed organist, had he been qualified. The instrument was finished in eighteen months, when it was found that the young dilettante had fully prepared himself for the noble parent had so wisely secured he could fill. Unrelaxing in his musical studies and labours, Lord Mornington so distinguished himself, that the University of Dublin conferred on him the degree of Doctor in Music, and subsequently elected him president of the College of St. Peter and St. Paul, and was succeeded by Richard, the present marquis of Wellesley.

Lord Mornington's compositions are chiefly vocal: some
for the church, and are to be found in the choir-books of St. Patrick's Cathedral. But he excelled most in what is undoubtedly our own national music, the glee. His four-voiced glee, "Here in cool grove," which gained the gold-prize medal given by the Catch Club in 1779, is a work of first-rate genius—a masterpiece. "Gently hear me, charming maid!" another of the same kind, published in Warren's 25th collection, is, it has been truly said, "overflowing with sweetness." "Counsel for four voices, has always been, and most likely will continue to be, admired for its brilliancy and skill; and "O, bird of eve," a glee for five voices, is, though short, one of the most elegant effusions that vocal harmony can boast.

"But, it is remarked by a writer in the Harmonicon, "honourable to Lord Mornington, considered as a man of genius, as were the praises bestowed on what we venture to call the offspring of his muse—praises wherein the succeeding age joined, and which the present has repeated—the glory that encircles his name derives its highest lustre from the acts of his own immediate progeny: one of the most accomplished statesmen of the period in which we live, and the greatest general that this or any age ever produced, owe to him their existence. In this, the worthy son of a worthy father, we have an illustrious example that probably to the forming of their minds, to his care of their education, they are indebted for that correctness of judgment and energy of action which have so much distinguished them."

MOROCCO. [Morocco.]

MOROSINI, an illustrious family of Venice, which had several dogs and other distinguished individuals among its members. Paul Morosini, born in 1406, wrote an "Apology" for the Venetians, and a "History of the Turks." A. Morosini, who died in 1618, wrote a continuation of Paruta's "History of Venice," down to the year 1615. But the most illustrious of the family is Francesco Morosini, who was born in 1618, served in the navy of the republic against the Turks, and was appointed commander of the fleet in 1651, and general-in-chief for the defence of Candia against the Turks. He made a most gallant resistance against very superior forces, and at last concluded an honourable capitulation with the grand-vizier Copropoli in 1669. [Camilla.] On his return to Venice, being having been made the subject of an inquiry, was fully justified.

In 1684, war having broken out again between Venice and the Porte, Morosini was appointed captain-general of all the forces of the republic. After sailing to Corfo, he advanced and took the island of Fuca, and also the town of Praveza on the coast of Epirus. In the following year he landed in the Morea with 10,000 men, took Corun by storm, and, being joined by the Mainoites, took Calamata, and defeated a Turkish army which was sent against him. In the meantime, Naxos and Molfet, defeated the seraskier, and gained possession of Napoli after an obstinate defence. In 1687 he again defeated the seraskier in a pitched battle near Patras, and seized his standard. This victory was followed by the conquest of, "Francois Le- pacio, Corinth, as it at the whole of the Morea. Morosini then landed at the Piraeus and attacked the Acropolis of Athens. It was in this siege that a shell, thrown by the Venetians, fell on the Parthenon, where the Turks had deposited their powder, and partly destroyed it. The Turkish garrison then surrendered.

In 1688 Morosini landed on the island of Euboea, but was obliged to re-embark his troops, owing to the malaria fever having broken out in his camp. That same year the doge, G. de Morosini, was elected in his place, retaining his command in the Levant, a thing unusual in the suspensive aristocracy of Venice. In 1689 Morosini returned to Venice; the senate in a body went to meet him at sea, and escorted him in triumph to the land, in a state of the most extraordinary and acclamation of the whole population. This was a proud day for Venice, the last day of triumph in her history of a thousand years. A few years after, Morosini, then old and infirm, was sent again to the Morea, when illness terminated his glorious career, at Nauplia, in 1693. A statue of bronze was erected to him in the hall of the Council of Ten. In imitation of the great captains of antiquity, the adjunt "Peloponnesiacus" was added to his name. His tomb is in the church of St. Stefano at Venice, with the inscription: "Francesco Morosini, Venetianus Principium Ossa." MOXYLIC ACID, or MORIC ACID, was discovered by Klaproth, combined with lime, on the bark of the Morus Alba, or white mulberry. It is obtained by decomposing the natural moroxylic acid of lime by acetate of lead and sulphate of lead being precipitated, the moroxylic and remains in solution. Some doubts are however entertained whether it is a peculiar acid.

MORPHIA, the first discovered of a numerous and important group of substances, is produced in the Peruvian termine alkaloids. It was obtained in 1803 by Bertussan, a German chemist, from opium, in which it exists in combination with a peculiar vegetable acid, the meconiac acid, and probably also with sulphuric acid.

Various methods have been proposed for obtaining morphia: the "London Pharmacopoeia" directs a solution of opium to be decomposed by chlorid of lead, by which meconiac of lead and a little sulphate are precipitated, and hydrochlorate of morphia remains in solution: by evaporation it is obtained, which are to be decocted by treatment with animal charcoal; when again crystallized, and decomposed by ammonia, the precipitate obtained, which is morphia, is to be again converted into hydrochlorate by dissolving it in hydrochloric acid; and this, when again separated, is obtained in crystals. Ammonia, yields morphia in a state of considerate purity.

Another method, proposed by Drs. Gregory and Robertson, is that of decomposing the aqueous solution of opium by means of chlorid of calcium. Meconiac of lime is thus precipitated, and hydrochlorate of morphia left in solution; this, by treatment with animal charcoal and repeated crystallization, is rendered pure, and morphia may be obtained from it by ammonia.

The properties of morphia are, that it is precipitated in a flocculent state, on standing and stirring, assumes a crystalline appearance: it is colourless, and its taste is bitter. According to Berzelius, it is insoluble in cold water; and boiling water dissolves rather more than 1-100th of its weight, the solution on cooling yields crystals; the hot precipitate, and hydrochlorate of morphia left in solution; this, by treatment with animal charcoal and repeated crystallization, is rendered pure, and morphia may be obtained from it by ammonia.

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MORRIS DANCE. Douse, in a dissertation on the
antient English Morris Dance at the end of the second
volume of his 'Old English Revels and Unkapers,' affirms
that both English and foreign glossaries uniformly ascribe the
origin of this dance to the Moors; although the genuine Moorish
or Morisco dance was, no doubt, very different from the
modern European Morris. Strutt, in his 'Sports and Pastimes
of the People of England,' cites a passage from the play of
'Variety,' 1649, in which the Spanish Morisco is men-
tioned; and this, Mr. Douse adds, not only shows the legiti-
macy of the term Morris, but that the real and uncorrupted
Moorish dance was not found in Spain, where it still con-
tinues to delight both natives and foreigners under the
name of the fandango. The Spanish morris was also danced
at puppet-shows by a person habited like a Moor, with casta-
nets; and Junius has informed us that the morris-dancers
usually blacked their faces with soot, that they might the
better pass for Moors.

It has been supposed that the morris-dance was first
brought to England in the time of Edward III., when John
of Gaunt returned from Spain (Pocke's Memorials of Milton,
p. 135); but it is more probable that we had it from our
Gallic neighbours, or even from the Flemings. Few if any
vestiges of it can be traced beyond the reign of Henry VII.,
about which time, and particularly in that of Henry VIII.,
the churchwardens' accounts of numerous parishes show
that the morris-dance made a considerable figure at par-
chial festivals.

The hobby-horse, which once performed the principal
character in the dance, was a light frame of wicker-work,
covered with a porcupine's or sheep's neck of a horse. This
was buckled round the waist, and covered with a foot-clout
which reached to the ground, and concealed at once the
legs of the performer and his juggling apparatus. Thus
equipped, he pranced and curvetted in all directions, neigh-
ing, and exhibiting his wonderful feats of horsemanship.
Besides the hobby-horse, there were the fool or buffoon of
the party; May or mid May, and her paramour a friar; a
serving-man, a piper, and two Morris-
coces. The dress of these personages is described by Fletcher
in his 'Women's Voices,' when he says,—

'Where are your belts then,
Your rings, your ribbands, frieze, and your clean napkins?
Your nosegay in your hat, pass away, &c.'

The napkins are still used in what remains with us of the
morris-dance. Gifford remarks, 'When the right good-will
with which these persons capered is taken into consid-
eration, the clean napkin, which was never omitted, will not
appear the least necessary part of the apparatus.' Thus
in 1609, in the ' familiar Letters,' Fullwright says, 'the
Morris would be morris-dancers by their gingle, but they have
no napkins.' Maid Marian was the lady or queen of the
May.

(Douce's Illustrations of Shakespear and of Antient
Manners; Brant's Popular Antiquities, 4to, vol. i., pp. 208, 209; Strutt's Sports and Pastimes, 4to.; Gifford's
Ben Jonson, vol. ii., pp. 50, 51.)

MORRISON, ROBERT, the first Protestant missionary
to China, was born at Morpeth, Northumberland, January 5,
1762. His parents were respectable and worthy persons
in humble life. After receiving some elementary instruc-
tion in English, writing, and arithmetic, in a school
conducted by a maternal uncle at Newcastle, he was
appointed at a very early age to his father. In 1799 he
commenced a course of religious thinking. In 1801 he
studied Hebrew, Latin, and theology, under the
superintendence of a Presbyterian minister of the town,
by whom he was introduced, in 1803, to the committee
and tutors of the Hoxton (London) Apprentice Society,
to be received into that institution. In May, 1804, he
offered his services as a missionary to the London Missionary
Society, and being accepted, he removed from Hoxton
to the Mission College at Gosport. In August, 1805, he
comm-
ended the study of Chinese, and in January, 1807, he
was ordained as a missionary, and in Sep-
tember of the same year he arrived at Canton. Before
leaving England he had procured from the British Museum
'a Harmony of the Gospels,' and the 'Pauline Epistles,
translated into Chinese by an unknown Roman Catholic
Missionary; and the Royal Asiatic Society lent him a
manuscript Latin and Chinese dictionary. In 1808 Mr.
Morrison was appointed translator to the East India Com-
pany's factory at Canton. In 1810 the Acts of the Apostles
G 3
in Chinese, which he had brought with him, were printed, after he had carefully revised and amended the text. In 1811 a Chinese grammar, which he had prepared about three years before, was sent to Bengal to be printed, but after many delays, it did not issue from the press until 1815, when it was printed at Serampore, at the expense of the East India Company. In 1812 the Society for the Diffusion of Useful Knowledge in Chinese was printed, and by the beginning of 1814, the whole of the New Testament being ready for the press, the East India Company sent out a press and materials, and a printer to superintend the printing of the work. In 1815 the Government of the Society sent out the Rev. (afterwards Dr.) Milne to assist Morrison, and they proceeded with the translation of the Old Testament. In 1815 the Book of Genesis and the Psalms were printed. In the following year the first director of the Mission, Dr. Lachlan Maclean, and before the end of 1821 was printed by the East India Company at a cost of 15,000 rupees. In 1817 the university of Glasgow conferred upon Dr. Morrison the degree of D.D. The Anglo-Chinese College, for Chinese and English youth, which he had projected, was also commenced. He published in the same year 'A View of China for Philological Purposes' in English, and a translation of 'Morning and Evening Prayers of the Church of England' into Chinese. The translation of the Bible was completed in 1816. From 1810 to 1818 the British and Foreign Bible Society contributed the sum of 6000 rupees, at seven different times, to assist in the printing and publication. The Old Testament formed 21 vols. 12mo. The Book of Job and the Historical Books were translated by Dr. Maclean, and the remaining portions by Dr. Morrison. Of the New Testament, Dr. Morrison translated the Gospels, and from Hebrews to the end. In 1821 Dr. Morrison came to England, and was introduced to King George IV., to whom he presented a copy of the Scriptures in Chinese. During his visit he made an extensive tour, and studied the state of Chinese literature in England. His first wife, whom he married in 1808, having died in 1821, he married Miss Armstrong of Liverpool, in 1826, and soon afterwards sailed for China. His time was now occupied in preparing a new edition of the printed works, and promoting education. In 1832 he wrote to his friends in England:—'I have been twenty-five years in China, and am beginning to see the work prosper. By the press we have been able to scatter knowledge far and wide. In the midst of these occupations Dr. Morrison died, August 1, 1834, at Canton. His confidant, Dr. Milne, who died some time before, said of Morrison, that 'his talents were rather of the solid than the showy kind; from the fact that he was no longer able to publish his works by means of his own exertions, bursts of genius; and his well-known caution fitted him for a station where one false step, at the beginning, might have delayed the work for ages.'

The translation of the scriptures, the great object of Dr. Morrison's labours, is in a chapter of the Old Testament was never realised; Dr. Milne died in 1822, and the correction of errors and the verbal alterations made by Dr. Morrison were not of great importance. The New Testament was published in much the same state as it was in 1814, and the Old Testament as it was left at his death. The last part of his life, Dr. Morrison became more and more confirmed in the necessity of a thorough revision, and he anticipated the probability of this being effected by his son, who has been the whole of his life's selection to succeed him as the translator to the Superintendents of British Trade at Canton, and could not therefore devote his time to this object. He was not in this position to allow. It is not in regular order to Dr. Morrison, that this revision of his work is necessary: it is the first version into the most difficult language in the world.

Two converted Chinese of literary abilities have given the following opinions of his merits. One of them says it 'exceedingly verbosely, containing much foreign phraseology, not so much as in the usual style of our books, that the Chinese cannot thoroughly understand the meaning, and frequently refuses to look into it.' These opinions are taken from a work entitled 'China, its State and Prospects,' by Mr. Mel- hurst, an active missionary who succeeded Dr. Morrison. The reader is in a fair case to form a view of the subject from these Professor Kid's 'Critical Essay' on Dr. Morrison's literary labours. In December, 1836, a committee of the British and Foreign Bible Society passed a resolution 'rebuking the complaints of the London Missionary Society in taking the necessary steps for securing a new edition of Dr. Morrison's work as appears to have been contemplated by the Dr. himself,' with a promise of defraying all the reasonable expenses of the work. In February, 1837, the committee invited Dr. W. B. in direction of the Bible Society, to consider the serious consideration, in the hope of securing a careful revision of the existing version, at an early time as may be practicable.' Here the matter at present (August, 1839) rests.

The Common Cod (Morrhua vulgaris, Cuv.; Gadus Morrhua, Linn.) is usually about three feet in length, but sometimes attains a much larger size, and weighs from sixty to seventy pounds. The upper parts of the head and body are of an olive brown colour, mottled with yellow or yellowish; the under parts and the lateral lines are white, and the fins are dusky. The proportions of a specimen three feet in length are as follows:—the length of the head compared with the total length (not including the tail-fin) is as one to two and a half: the depth of the body at the end of the head; the first dorsal fin commences in a vertical line just behind the origin of the pectorals; the second dorsal and anal fins in a line parallel to the anal opening, and terminate in a line parallel to and anal opening, and terminate in a line nearly parallel to the origin of the caudal fin; the third dorsal and the second anal commences and terminates in the same vertical line; the tail is truncated.

The Cod-fish is an inhabitant of the northern seas. In this country it is found on all parts of the coast, and in the United Kingdom alone this fish, in the catching, curing, the partial consumption, and sale, supplies employment, food, and profit, to thousands of the human race.

The account of the mode of fishing, &c., given in that most excellent work the 'History of British Fishes,' is as follows: 'The cod-fish is very valuable, and no favourable circumstance for the fishermen, who experience little difficulty in taking them with almost any bait, whenever a favourable locality is ascertained. As these fishes generally inhabit deep water, from twenty to forty and even fifty furlongs from the shore, and feed near the gravelly, muddy, or sandy bottoms, crustaceans, and testacea, their capture is only attempted with lines and hooks. Two sorts of lines, adapted for two very different modes of fishing, are in common use. The hooks accompanying the lines are formed of shorter lines, or snoods, are formed of separate threads loosely fastened together, to guard against the teeth of the fish. Some varieties occur at different parts of the coast as to the number of hooks on the line, as well as in the length of the snood.'
Between two smoods one always doubles the length of the smood itself. Buoy, buoy-ropes, and anchors or grapples, are fixed one to each end of the long line. The hooks are baited with sand-launce, limpet, whelk, &c. The lines are always more to catch. It has been observed, that when the tide runs upon the end of the line, it will force the hooks together, by which the whole tide's fishing is irreco-

\* An improvement upon this more common plan was some years ago suggested by Mr. Cobb, who was sent to the Shetlands by the Commissioners appointed for the Improve-

\* A change has lately taken place from the Cod having shifted their ground. Formerly the Gravesend and Barking fisheremen obtained no Cod nearer than the Orkneys or the Dogger Bank; but for the last two or three years fishing has been obtained by going no farther than the Lincolnshire and Norfolk coasts, and even between that and London, where previously very few fish could be obtained.

\* The haddock (Morrha angulosa, Cuv.), a common fish in our markets, is of a smaller size than the cod, and still more plentiful. In a specimen twenty inches in length, the long-ness of which the head, when viewed from the side, is equal to the length of the body, its fins are situated nearer to the head than to the tail. When and larger, Tunin Cod.

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the twelfth), any given table of mortality might be very nearly represented; but such complexity would be useless, and it has therefore never been attempted. Similarly, by using area of different curves, a near representation might be attained; but such a method, being practicable in many different ways, would present the interest attaching to one simple and uniform law, and would only attract attention by offering facilities for the actual calculation of life-continuees.

In 1752 Lambert presented an equation of the following form, as representing very closely the London table (ε is the base of Napier's logarithms):  
\[ y = 10000 \left( \frac{96 - x}{96} \right)^{676} \]

where \( a \) being \( 1 : 13\,652 \), and \( b = 1 : 2\,43114 \), and \( y \) being the number surviving at the age of \( x \), out of 10,000 born. This form, if it could be made to represent other tables, by an alteration in the constants, would be one of great practical utility; but we are not aware of any attempt having been made to extend it.

Mr. Benjamin Gompertz, in 1825, presented to the Royal Society a memoir 'On the Nature of the Function expressive of the Law of Human Mortality.' As this ingenious paper contains a description of this high probability, and terminates in a conclusion which accords in a great degree with observed facts, it must always be considered as a very remarkable page in the history of the inquiry before us. It is enterprising in every sense of the word, and, so far as we know, it is necessary as an act of justice to Mr. Gompertz, whose ideas have been adopted by a recent writer on the subject, without anything approaching to a sufficient acknowledgment.

The law in the human constitution a power of resisting the effects of disease, which increases from birth up to a certain age, and diminishes from that time forward; the evidence of such diminution being the increased proportion of deaths in a given time. The proportion is found, in most tables, not to be altered by equal quantities in equal times, but to diminish in a greater ratio as life goes on. Mr. Gompertz assumes that the power to oppose destruction varies equal proportions in equal times; so that the intensity of mortality, supposed inversely proportional to this power, must be represented by the formula \( y = k x \), where \( a \) is its value at the commencing age from which \( x \) years are reckoned, and \( q \) a constant depending on the rate of increase of the intensity. If therefore \( y \) be the number living at the end of \( x \) years, \( y = k x^q \) is the decrease in the time \( x \), where \( b \) is another constant; and this gives \( \frac{d y}{d x} = x a k^q \) by which integrated is the form

\[ y = k x^q \]

where \( k \) and \( q \) are to be determined. This can be done by three values of \( y \) out of the given table; and the result, hitherto purely hypothetical, can then be compared with the other parts of the table, by calculation of the values of the formula for different ages. The more convenient form of the above is:

\[ \log y = \log k + q \log x \]

where \( \log k \) and \( q \) are taken without reference to the sign of \( q \). The lower sign is used according as \( q \) is greater or less than unity.

Among other propositions, Mr. Gompertz has made one which is actually a table of the age of 10 to that of 60, and another following different values of \( l \), \( g \), and \( q \) from 60 to 90, of which results may be obtained in the only instance as great as any obtained before. He thus speaks of logarithms, and \( q \) meaning the age of mortality:

\[ \log \frac{d y}{d x} = \log \frac{\text{logarithm of } y}{\text{logarithm of } x} \]

It is seen the discordance between the logarithms of the table in the second, third, and fourth years of age, is only one instance in which the method of Gompertz is imperfect. It is a form of the table in the second, third, and fourth years of age, which is equal to the logarithm of a simple equation. A person born, \( M_0 \), dies in their first year, \( M_1 \), in their second year, and so on. But if the population be in a state of increase, and if the annual ratio of increase be that of \( 1 + x \), those who die in the age of \( t \) do not decrease and increase in the same table, but in a larger table with a larger number of persons. The former must be reduced, or the latter increased, in the proportion of \( 1 + x \); so that if \( M_0 \), \( M_1 \), \( M_2 \), \( M_3 \), persons born, \( M_0 \), die in their first year, \( M_1 \), (1 + p) in their second, and so on.
A table of mortality may also be given in the form of a table of the mean durations of life, calculated as in Life, MEAN DURATION OF. Or the table of mean durations may be calculated from the table of yearly rates, as follows:

Let \( a \) be the mean duration of life of males aged \( m \), and \( m \) the yearly rate at the same age; then

\[
\frac{a}{m} = (1 - m) (a + m) + 1
\]

by which, beginning from the end of life, the mean duration at each age may be computed from that at the age next higher.

Various tables of these several kinds have been constructed, beginning with that made by Halley from the town of Bristol, and first engraved in the Royal Society's 'Table of the life Assurance Office from its own materials. If we were to look to the wants of the subject, whether as a physical investigation or a statistical one, we should find that it is everywhere in demand. To have presented a table of the differences of mortality between the two sexes is established, and it also seems to be known that where the occupations of females are not above their strength, their mortality is less than that of males; but no settled determination of the amount of difference to begin to raise their rates. This occasioned great dissatisfaction, single life is the longest, whether the age of the parents, or the relative age, affects the mortality of the children, whether the earlier children of a marriage differ in their law of mortality from the later, &c., we have no information at all.

In a letter to Mr. Boscawen, in 1730, he laid great stress on the attention paid by the government to statistical subjects has produced some results which are worth a good deal; the reader may consult the article in the Encyclopédie Britannica already cited for reference to them. We shall now give only a very partial list of the most remarkable earlier tables connected with the subject.

A.D. 1538, parish registers first kept in England. 1540-41. The statute 32 Henry VIII, c. 28, enabling ecclesiastical persons and corporations to grant leases for three lives, or twenty-one years, or joint survivorship.

When we think of the long periods of the lives of the most remarkable earlier tables connected with the subject, we are struck by the attention which has been paid to the subject of life leases in England. It gave rise to certain tables of the value of leases which were called Annuités, and which were published by the various provinces, as thought by later writers, about the end of the reign of Henry VIII. They assume a rate of interest greater than 11 per cent. After the Restoration, when the interest of money had very much fallen, the ecclesiastical lessees began to raise their rates. This occasioned great dissatisfaction, and frequent representations to the House of Commons.

In 1698, the Duke of Marlborough published his table of the square roots of the ages. In 1698 were published the well-known 'Tables for renewing and purchasing the leases of Cathedral Churches and Colleges,' the methods of which were certified to be correct by Newton, and which there have been frequently called Newton's Tables. About 1720, if not before, a letter called 'The Value of Church and Colleges' was considered, was appended to these tables, and a very sharp controversy took place, which produced no ill effects, but only appearing to custom, the lessees showing the value of life and interest of money that the church landlord dealt more leniently with his tenant than the layman, as was indeed the case. Among the writings which arose out of this controversy, was that of Mr. A. H. de Moivre, 'On Annuities,' containing the complete tables of annuities which had been published.

The work of Grant and the political essays of Sir William Petty preceded, and probably stimulated the attempt of Halley to construct (A.D. 1692) a table from the bills of mortality at Breslau, which was published in 1693. In 1699 came Dr. Davenant's 'Essay,' &c. containing extracts from some tables by Gregory King (afterwards published entire), which Mr. Milne states to represent the same mortality as the French tables of lives (constructed from Dutch registers of annuities) appeared in 1738, 1740, and 1742. De Moivre's 'Treatise on Annuities,' containing his celebrated hypothesis, was published in 1724; and Thomas Simpson's work on the same subject, containing a table deduced from London life observations, in 1742. De Moivre, in 1747, published his 'Treatise on Annuities,' containing this table deduced from the lives of French annuitants, as well as from monks and nuns. These were the first tables in which male and female life were distinguished from each other.

The works of Mr. de Moivre contain altogether a large number of tables, which we shall here no further notice than to give references to the works in which they may be found, with other matters connected with the same subject.


'The Doctrine of Annuities and Assurances,' by Francis Baily, London, Richardson, 1816. This work, now out of print, has been lately translated into French, under the title 'Théorie des Annuités Viagères,' traduit de l'Anglais par Alfred de Courcy, Paris, Bachelier, 1836.


On the Natural and Mathematical Laws concerning Population, Vitality, and Mortality,' by Francis Corbeaux, London, 1833. This work contains a large number of tables.

Reports (two in number) of Select Committees of the House of Commons on the Laws respecting Friendly Societies. Ordered to be printed, July 5, 1822, and June 29, 1827.

'Library of Useful Knowledge,' treatise 'On Probability,' 1833.

'Treatise on Friendly Societies,' by Charles Ansell, &c., London, Baldwin and Craddock, 1845.

'Tables showing the total number of persons insured in the Equitable Society,' &c., by Arthur Morgan, London, 1844.

Mr. Rickman's various reports on the Population Census contain tables deduced from them.

Recherches sur la Production et la Mortalité, &c., par MM. Quetelet et Smita, Bruxelles, 1832; and 'Sur l'Homme, &c., on Essai de Physique Sociale, 2 vols., par A. Quetelet, Paris, Bachelier, 1835. These works exhibit for Belgium what we could wish to see imitated in England.

We shall now proceed to give some tables of mortality, namely, the Northampton and Carlisle tables, those of the Equitable Insurance Office, and Mr. Ansell's Friendly Societies' table. We shall give a brief description of each.

1. Northampton Table. This table was formed by Dr. Price from the burial registers at Northampton, between 1741 and 1760. He has not distinctly described the process by which he formed it. This table was for a long time the only one used by the insurance offices. It is now known to give the probabilities of life too low at the younger and middle ages. Some of the data (but probably not all) is due to the increased value of life in England since the middle of the last century. This table contains both males and females in nearly equal numbers.

2. The Carlisle Table. The materials of this table were obtained by Mr. Milne from a tract published by Dr. Heysham of Carlisle, called 'Some Account of the Mortality of the middle ages of life is remarkably close.' (Price, on Rev. Pym., vol. ii, p. 94.)

3. The Equitable Table. The tract in which this is found is cited above. It represents the experience of the Equitable Society from 1771 to 1839, and agrees closely at the middle ages with the Carlisle Table. The agreement would be a little closer in most parts but for the following circumstance. In the formation of this table it is presumed that all those who discontinued their insurance lived, one with au-
other, one-half of their year of discontinuance in the Society.
Now (throwing aside short insurances, which are always
even very small in number) the modes of discontinuance are
only abandonment by neglect to renew the premium, and
sale to the Society. In the former case the parties live the
whole year of discontinuance in the Society, since their
intention not to renew would be no bar to a claim on
the part of the executors if their death took place during a
year in the course of which no premium had been paid;
and it is well known that in the earlier history of every
insurance office, abandonments were much more frequent
than sales. And even in the case of sales to the office, it
may causally be supposed, unless proof to the contrary
were shown, that they take place, for the most part, shortly
before a new premium becomes due, parties frequently
choosing to take the benefit of the insurance as long as
they can, and to sell when a new payment is approaching.
It must therefore be supposed (unless, as before hinted at,
specific proof from the records of the office produced to
the contrary) that the discontinuants, or a very large ma-
majority of them, lived the whole year of discontinuance in
the office. This will make the mortality a little less than
that represented in the table, though not much.

There is also a point on which, if our information be
correct, the method of forming this table has been misap-
prehended. Those who study the subject are aware of the
thing to which we refer (Enc. Metr., article 'Mortality' in
part § 52, note), and will therefore apprehend the fol-
lowing. It is, we understand, the practice of the Society
in question to make up the registers on the first day of
January, at which period every person insured during the
previous year is put down as being of the office age which
he had at his entrance. Now this office age means the age at
the next birthday; that is, one with another, parties do not
attain their office age till they have lived half a year in the
Society. But on each first of January the parties insured
during the previous year have one with another, lived half
a year in the Society, so that they are correctly stated as
being of their office age when the registers are made. The
premise of this very valuable table is not sufficiently explicit
on this and several other points.

4. The Northampton Table. The materials for this
table were collected by the Society for the Diffusion of Use-
ful Knowledge, and were discussed by Mr. Ansell in the
work cited above, which should be in the hands of every one
interested in the excellent institutions of which it treats.
It embraces the history, as to mortality, of 34,323 years of
life, among the labouring classes, from all parts of England
discriminately, and from 1823 to 1828.

I. Decrement of Human Life, according to the North-
ampton, Carlisle, Equitable, and Friendly Societies’
Tables.

<table>
<thead>
<tr>
<th>Age</th>
<th>Northampton</th>
<th>Carlisle</th>
<th>Equitable</th>
<th>Friendly</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1552</td>
<td>1550</td>
<td>1553</td>
<td>1555</td>
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<tr>
<td>3</td>
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<td>1883</td>
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<td>5</td>
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<td>8</td>
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<td>1727</td>
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<tr>
<td>9</td>
<td>1688</td>
<td>1688</td>
<td>1688</td>
<td>1688</td>
</tr>
</tbody>
</table>

The explanation is as follows:—Of 10,000 infants
at Carlisle, 1539 would die in their first year, and
would survive, while 4000 would live to 36 and expire
in the Equitable Table, of 3922 persons surviving the age
of 40, 43 and 44 die in the two succeeding years, i.e.,
3835 surviving at their 42nd birthday.

Of the three species of tables, this is the most ma-
mathematical deduction, and the least adapted for a
The best way of using them for the examination of their relative bearings is to compare the probable life, as it is called, of the two, that is, the time in which the numbers living are reduced one-half. Thus, taking the age of 31 as the age at which the numbers living in the Northampton table are halved, and the age of 39, while in the Carlisle table, this does not happen till the age of 67.

III. Mean Duration of the Lives of 100 Individuals of every Age, according to the Northampton, Carlisle, Equitable, and Friendly Societies Tables.

<table>
<thead>
<tr>
<th>Age</th>
<th>Northampton</th>
<th>Carlisle</th>
<th>Equitable</th>
<th>Friendly</th>
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</thead>
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Thus, of 10,000 persons attaining the age of 40, 130 die in the following year, according to the Carlisle tables; while of 10,000 who attain the age of 41, 138 die in the next year. This species of table is the only one of the three which is immediately applicable to the comparison of two sets of data at and near a given age; while the one to which we now come serves to compare the total character of two sets of data from and after a given age. It also unites the fluctuations of different years, by compensation; thus looking at tables II. we should hardly suspect that closeness of resemblance between the Carlisle and Equitable tables, in the value of life, which is obvious on those marked III.
proceed to some general account of the state of mortality, restricting ourselves to the last and present centuries, to life in England only, and to the general variations of mortality and the relative mortality of the sexes.

The circumstance which must strike every one as most remarkable, is the great increase in the length of life thus obtained in longevity. To put this in a clearer light, we shall collect various tables of the mean duration of life, specifying the epochs of their collection. The tables formed from male lives only, have a capital letter; from female lives only, a small letter; from both, a capital and a small letter. At the bottom of each table is given the period in which all or most of the lives became extinct. The number in the table is the number of years enjoyed by ten individuals:

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Comparing tables made from the same sex, or from the mixture of both, that is, looking at T, R, A, E, and G together for the males (P and F are made from the labouring classes exclusively), at t, r, and g for females, and at L, H, N, and G for both together, the general increase of longevity is sufficiently apparent. The older tables, made from burial-registers, will not prove more than the general fact, uncorrected as they are both for increase of population and migration. The great excess of the Carlisle Table, it must be remembered, is partly owing to the deaths from small-pox having been allowed for, which, though necessary in a table intended for subsequent use among a vaccinated population, prevents the comparison between the Carlisle and other tables from being altogether fair. The tables A and F are very similar, and show that the life of the more provident class of labourers (who resort to Friendly Societies) is now as good as those of the Amicable Insurance Office in the last century. That Society is supposed not to have been, in former times, so careful in the selection of lives as the modern institutions of the same kind. This was probably the case, though another circumstance may have operated still more on the table. Up to the year 1738, in which the register of lives began, 45 years was the usual age at which admission was allowed so that, while the registers of the Equitable Society have been constantly recruited with selected lives from 45 to 60, as well as at the lower ages, those of the Amicable Society have not had the same advantage above the age of 45. We think however that much of the difference between the two arises from the earlier period which the tables of the latter Society represent.

That the life of a Chelsea pensioner, who is presumed to be a worn-out soldier, should be better than that of the most provident class of labourers, may seem startling at first; but it must be observed that this is only after the age of 40; and the explanation of this circumstance hangs upon another which it is essential to notice.

Let us compare the relative lives of the young and old in the different tables; that is, for instance, dividing the life of a person aged 20 into 1000 parts, we ask how much such parts there are found in the life of 60. Ranging the results in order of magnitude, we find that, the life of 20 being 1000 in every table, the life of 60 is as follows:

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To show that this distribution does not arise from the method of forming the tables, we have put the commas after all symbols of tables formed from burial-registers (except the Carlisle, which has been in every point too carefully corrected to allow it to rank in method of formation with the rest), and the symbol * after those tables which have been formed in such a manner that no errors of the preceding kind can appear. It will then readily be seen, as a general result, that old life is relatively longest in those tables in which life in general is

* Mr. Lubbock's corrected table ("Lite. Usec. Scn., 2. Pensioners") should have been printed, not as it is printed, "Pensioners," in the Table of Mortality for 1799, and given a foot-note, if not only to be added to 1799.
absolutely shortest, and that tables formed from female life, except in the middle run. We have observed the same thing in many other tables, and we think a general explanation can be given. It is well known that the admirers of nature (many of them, at least) formerly included savage life in their panegyrics, and contrasted the uniform good always and everywhere, in activity with the frequent deformity and debility of the civilised man: this opinion however has declined since it was remarked that such uniformity of strength was probably a consequence of its being impossible for a disabled or weakened individual to subsist when the higher branches of industry procured common necessaries. Something of the same sort seems to take place with regard to mortality: where the predisposing causes of death are strong and inadequately met, the weaker constitutions swell the table of mortality at the younger ages, leaving a relatively stronger class to face the chances of more advanced life. Thus in the case of a disabled soldier, he who can last to 60 is half as good, in point of duration, as he was at 20; while the insurer in the Equitable is only 16 per cent as good relatively, and absolutely not nearly so good as the former.

It is sufficiently obvious that female life is better than male, from every comparison of the preceding tables, and almost at every age. To compare these durations, let us suppose the death-rate to be the same in every age in both sexes.

Gend. If we then take the united amounts of their average lives from 15 to 85, we find that, one age with another, and for equal numbers of males and females similarly distributed,

For 1000 years of King William’s Tontine 1104 Years of male life in the Equitable Tables 1183 Years of female life in the Government Tables 1163 life years.

There appears then to have been a slight increase in the comparative goodness of female life: from which those who admit it must conclude that improved medical science and greater accessibility of comforts lengthen the life of females more than that of males. At any rate the other extreme is tolerably well proved by foreign (and very many analogous reasons are adduced by the point), namely, that when the lives of women are employed in laborious occupations in the open air, they are materially shortened in duration. In Belgium the lives of women living in the country are, on the whole population in the country (mostly laborers, of course), shorter than those of men; while in the towns they are longer, the proportion above-mentioned being that of 1000 to 1071.

On the mortality of the infant periods of life there is but little information. Males, except the Government Annuities, unite in showing that the value of life improves up to a period which differs in different tables; being six years of age in the Northampton Table, and five in the Carlisle. With respect to the Government Table it must be observed that the numbers in the first table are small, and also that all the lives are selected. If then it be more easy to select the best lives from among infants than from among grown people, the anomaly of these tables is explained; and the explanation is not difficult to admit, if we remember that the selection is made in most cases by the relations of the party selected, who are perfectly aware both of the state of health of the infant (generally more marked than that of a grown person) and the longevity of its ancestors. We cannot, therefore, say that the table is correct; and we strongly suspect that the last 13 years of the Carlisle Table are no exaggeration, but really considerably short of the actual law which prevails among the middle classes of society.

MORTAR. Common mortar is the substance placed between the stones or bricks of a building to cement them together, and thus cause them to retain their places and give strength and stability to the edifice. Mortar is essentially composed of lime and siliceous sand, the first being in the state of hydrate or slaked lime; the sand is used of different grades of fineness. The hardness which mortar acquires is owing to the gradual conversion of the hydrate of lime into carbonate of lime, which takes place very slowly by the absorption of carbonic acid gas from the atmosphere; in fact it advances very slowly to the particles of silica diffused through it, and become strongly united with the material employed in the building.

In order that this change may occur with advantage, certain conditions are requisite: if the mortar dries too quickly, the carbonate, formed will remain much subdivided,
and will not acquire the necessary adhesive property; if, on the other hand, the mortar be placed under water, a portion of the lime will gradually dissolve, what remains will become carbonate with great difficulty, and the particles of sand will be isolated. If, on the contrary, the mortar be long kept moist and exposed to the air, the carbonic acid gas acts slowly but incessantly on the lime, the water of which becomes gradually saturated with it, and this being transferred to the lime, it is converted into an almost crystalline carbonate, in successive portions or layers, and these adhere with great force to the particles of sand. It follows, from what has been stated, that buildings erected with mortar, are strongest where it is to those which are constructed later in the year; but it is to be observed, that during frost, owing to the freezing of the water, the absorption of carbonic acid is not only stopped, but the solidity of the mortar is destroyed by the freezing or crystallization of the water.

The proportions of lime and sand employed are subject to considerable variation; those most commonly used are said to be a bushel of lime to a bushel and a half of sand; but where lime is in quantity smaller. The method of making the mortar is perfectly simple; the lime is either first slaked by the addition of water, and then the sand and more water are mixed with it, or the lime and sand are first mixed, and water is afterwards added to the mixture. The proportions of sand and lime have given it the opportunity of slowly acquiring the carbonic acid from the air, upon which its hardness and durability depend. It is to be observed that lime which is not sufficiently burnt, or lime which has been slaked by the mortar, and which has been acquired by exposure to the atmosphere, cannot form good mortar; the first has not been deprived of the carbonic acid which it is requisite to retain slowly from the air, and the latter has re-acquired the carbonic acid, which diminishes instead of increase the solidity of the mortar.

When limestones contain considerable portions of silica and alumina, they form what has been termed of late years *hydraulic lime*, and the mortars made with them are called hydraulic mortars. The rock is rich with water, and is a well-known kind; it will set, as it is termed, or become solid, in a quarter of an hour, either in the air or under water. In France artificial hydraulic lime has been prepared, and appears to be the proper use. It is well known that limestone from which Parker's cement is made contains about 62 per cent. of carbonate of lime, 6 of carbonate of iron, 15 of silica, 5 of alumina, 6 of water, and some oxide of iron.

**MORTAR**, a vessel in which substances are either reduced to fragments, pulverised, or dissolved by beating or triturating with a pestle. Mortars are made of different materials and various sizes and forms, according to the use to which they are to be applied. For the purpose of breaking large masses into smaller, or for pulverising ores, metals, and coarse or heavy matters, a large cast-iron mortar with a pestle of the same material is generally preferred; it is placed upon a block, the pestle being attached to a spring, which greatly relieves the operator. Mortars made of wood are suitable for coarse grinding; those made of steel or cast-iron are best for reduction, mixing, and dissolving, and they are generally used by apothecaries and chemists in preparing medicines. In some cases glass mortars are used, but this is only for solution or mixing, and not for pulverising.

For nice chemical uses, such as the reduction of substances to fine powder, an agate, flint, or porphyry mortar is used, care being taken that the mortar is of a sufficiently hard material to prevent abrasion by the substance pulverised in it.

**MORTAR'EA**, The Province of, in the Sardinian territories, north of the Po, forms part of the great plain of Lombardy, and is bounded on the north by Novara, on the west by Vercelli, on the south by the Po, which divides it from the city of Turin, and separates it from the Milanese territory. The Agogna and the Tardoppio, both affluents of the Po, cross the province from north to south. The length of the province is 25 miles from east to west, and its breadth is about 22 miles from north to south. The products of the country are rice, corn, Indian corn, wine, and silk; there are also pastures for cattle. This district is distinguished by the name of the small town of Lomellina, from the small town of Lomelino. It constituted a fief of the empire, with the title of marquisate. The towns are,—1. Mortara, with 4000 inhabitants; 2. Vigevano, the largest town in the province, near the right bank of the Ticino, which is a bishop's see, has several churches and convents, manufactories of guns, hats, and soap, a poorhouse and workhouse opened in 1832, and 12,000 inhabitants. (Neigeberg, Calendario Sardo.)

MORTARS are pieces of ordinance which, when loaded with shells or carcasses at considerable elevations (generally at 45°, but sometimes as much as 70°), in order that the missile may range to a great distance, and, by falling near or actually upon the object (a batter, magazine, or armament), may crush it by the momentum acquired in descending. Mortars are either of iron or brass; they rest upon solid beds, and the trunnions or cylinders upon which they turn, in giving the required elevation, are placed at the lower extremity of the mortars' platform, in a battery, should be very strong, in order that it may bear the great recoil or shock of the piece when fired; and it should be carefully laid in a horizontal position.

The calibres of mortars in the British service are 38, 46, 5, 10, and 18 inches, and are all employed in the navy; but in this latter service the pieces are about 16 inches longer than the land-service pieces of the same calibre. The mortars are some of the finest made by the royal mortars. By varying the charge of powder in the shelling, it has been found that there is a particular elevation wheel, with each charge, gives a longer range than is obtained from an equal charge at any other elevation. It has also been found that the calibres and shells which give the longest ranges differ much in two mortars of different calibres, but of like proportions, even when charged with quantities of powder bearing the same proportion to the weights of the shells.

It has been supposed that mortars were employed in the year 1492, to the defence of the town of Mainz, and other ground than a statement that artillery of considerable magnitude was conveyed to Italy with the army of Charles VIII. In 1588 however the use of mortars must have been well known; since, in the Appendix to the *Colloques de Tarragona*, it is mentioned that the method of filling and projecting carcasses is fully described; and it appears that, in the same year, shells were thrown from ordnance at the siege of Wachendorf. [Bonux.] Redelius says that the first mortar was fired by the Swedes, at Bremen, in 1665.

The first artillerymen were somewhat capricious in the formation of their great ordinance; and among the various kinds which they devised may be mentioned what were called Podolite or Podolion mortars. These mortars were most generally used for the reception of a shell; and about it, on the face of the muzzle, were sunk thirteen chambers, each of which contained a grenade. The shell and grenades were discharged at the same time, and in the air they must have appeared like a flight of birds; from which circumstance, no doubt, the name of the mortar was taken.

The Dutch engineer Coehorn invented a small mortar for throwing grenades into the covered-ways of places. They were capable of being carried about and served by one man, and if fired, had the effect of a fire of 13 lbs. of shot fired from the same spot, and rapidly fired when it was intended to drive the defenders from behind the parapets. In the French service *Pierrieres* (small mortars loaded with stones) are still employed for the same purpose.

In the year 1777 an experiment was tried at Gibraltar on the discharge of stones from an excavation in the rock. The figure of the excavation is a parabolic conoid, whose axis is 4 feet long, and whose diameter at the muzzle is 3 feet. It threw a charge of 24 lbs. of powder, and on the explosion taking place, nearly one-fourth of the stones were projected to the distance of 100 yards. There are several rock-mortars, as they are called, at Malta, and such may on some occasions be useful for the defence of a place.

**MORTGAGE.** A general notion of a mortgage may be collected from the following passage in Littleton (§ 332), who treats of mortgages, as then in use, under the general head of estates upon condition.
If a feoffment be made upon such condition, that if the
feoffor pay to the feoffee, at a certain day, 40l. of money,
that then the feoffor may re-enter, &c., in this case the
feoffee is called tenant in mortgage, which is as much to
say, in French, as mortgage; and in Latin, mortuam ca-
sum. And if the land that the cause of the mortuam ca-
sum is, for that it is doubtful whether the feoffor will pay,
at the day limited, such sum or not: and if he do not pay,
then the land, which is put in pledge upon condition for
the paymen of the said 40l. of money, is taken from him for
ever, and so dead to him, upon condition, &c. And if he doth pay
the money, then the pledge is dead as to the tenant, &c.

The money thus agreed to be paid by the feoffor must be
supposed to be money borrowed from the feoffee, or the
mortgagee, and that it is not for the greater benefit of the
Littleton does not expressly say so. According to the terms
of this contract, if the feoffor or the feoffee's heir did not
pay the money at the time appointed, the land became the
absolute property of the feoffor.

The mortuam vadium of Glanville (book x.) is evidently
a different thing from the mortuam vadium of Littleton,
and Glanville's explanation of the term seems more ap-
plicable to his mortuam vadium, than Littleton's is to the
mortgage use, as he describes, 'When an innovator does thing,
says Glanville, 'called a mortuam vadium, and if there has been
delivered to the creditor for a definite term, it has either
been agreed between the creditor and debtor that the pro-
ceeds and rents shall in the meantime reduce the debt, or that
the debt shall be discharged. Wherever a mortgage is
just and binding; the other unjust and dis-
honest, and is that called a mortgage, but this is not pro-
hibited by the king's court, although it considers such a
pledge as a species of usury. (Beaum's Trans.)

The mortgagee is the owner of the land which he con-
tracts, and the court of equity gradually introduced such modifications
as to convert a mortgage from its ancient simplicity into a very
artificial and complicated arrangement. A mortgage is a
contract, and therefore requires two persons, and either
way the debtor mortgagor.
The borrower is the owner of the land which he con-
tracts, or transfers as a se-
curity to the lender of the money: the borrower is called
the mortgagor, and the lender is called the mortgagee.
The whole transaction is properly termed a mortgage, but the
name is sometimes applied simply to the debt. The nature
of this contract, as it is now understood, will best appear
from a brief enumeration of the essential terms of the in-
strument called a mortgage deed. For the sake of sim-
plicity, there has been given a copy of a mortgage deed
for example; and the remarks which follow must be considered
as applicable to that description of mortgage.

The instrument of mortgage is a deed indented. It
commences by reciting that the mortgagee is the owner in
fact of the land, and that it is intended, at the instance of the
mortgagor, to convey to the mortgagee, and that the mortgagee has
agreed to lend him a certain sum of money on the security of the
lands. It is then declared that, in pursuance of the said
agreement, the mortgagee, or any person to the use of the
land, the money of which he is (the mortgagor) has agreed to
lend. The mortgagee then conveys to the mortgagee and
his heirs the lands in question, with a condition that if the
mortgagor, his heirs, executors, administrators, or assigns,
shall pay to the mortgagee, his executors, &c., the sum of
money borrowed, with interest at the same rate as the rate
at the time mentioned, upon a future day, which is
dated in the deed (generally a year from the date of the
mortgage deed), without any deduction or abatement what-
soever, and the same and be kept by the mortgagee for
the purpose of paying the principal money borrowed, and, as before agreed, the mortgagee has agreed to lend him the
same at the rate of interest agreed upon, and at the time before mentioned, if the same sum is not fully paid
in. In addition to this conveyance of the lands, the
mortgagor promises and undertakes to pay the principal
money borrowed, and interest on the same, at the rate and
at the time before mentioned; and it is agreed that he has full
right to convey the lands in the manner expressed in
the preceding part of the instrument. It is further agreed
that, if the mortgagee shall have failed to pay the prin-
cipal money borrowed, with interest thereon, as aforesaid, or any part thereof, as before agreed, the mortgagee, his heirs, or assigns, may take
possession of the lands so conveyed as aforesaid, and use and
enjoy them, and take the rents and profits, without any hin-
drance or interruption from the mortgagor, his heirs, execu-
tors, administrators, or assigns. It is also provided that until the mortgagee shall have made
such default in payment as aforesaid, he, his heirs, or as-
signs, shall hold and enjoy and receive the rents and pro-
fits of the lands without any interruption or hindrance from
the mortgagee, his heirs, or assigns. In many mortgage
deeds it is also provided, that if the principal money and
interest, or any part thereof, as before agreed, is not
paid on the mortgagee may sell the mortgaged lands (giving
proper notice to the mortgagee of such his intention, if
notice is provided for by the instrument): it is also provided
that the mortgagee may not sell the mortgaged lands, and out of any
rents or profits which he may have received from the lands,
the costs and expenses of the sale, and all other expenses
incurred in the execution of the trust for sale, and retaining
what is due to him for principal and interest, the mortgagee
cannot be made, by any means, to sell the lands to the executors, administrators, or assigns, or as he or they shall
direct. In deeds which contain a power of sale, it is usual
to insert a proviso, that such power of sale is not to destroy
or prejudice the mortgagee's right of foreclosure.

These are the essential parts of a mortgage-deed, which
is varied according to the estate or interest in the lands
which the mortgagee conveys to the mortgagee, and accord-
ing to the special agreement of the parties. By the execution
of the deed, the mortgagor is in possession of the lands mort-
gaged, and is conditionally transferred to the mortgagee, who
is the mortgagee's estate is not forfeited till he makes default in pay-
ment of the money borrowed and interest at the time named
in the deed. The money borrowed is however seldom paid
in the time agreed upon for conveyance, and the mortgagee's
estate is forfeited by his not fulfilling the con-
dition, and the mortgagee becomes the absolute legal owner
of the land, or of such estate in it as was conveyed to him.
He can then bring an action of ejectment against the mort-
gagor, if the mortgagee is in possession of the lands mort-
gaged, and the mortgagee shall not have given him notice;
and he can do this even before default in payment, unless it is agreed by the mortgage-deed that the mortgagor shall remain in possession till he makes default,
in which case the mortgagee can only bring an action of ejectment.
After the mortgage is made, the mortgagor cannot make a
lease of the lands without the mortgagee's consent, for he
has no interest in the land out of which he can create a legal
estate; and if any such leasee gets possession of the
land, the mortgagee may eject him. But the leasee who
claims by a title prior to the mortgage is not affected by
the mortgage transaction, though, after default is made and he
has notice from the mortgagee, he is bound to pay to him
the future rents and those which are then due.

The purpose of the mortgage is, in essence, to create a legal
interest in the mortgagor's property, which serves the same
doctrine of the contract and the mortgagee, and the nature of the relation of the mortgagor in possession and the mort-
gagee; and this relation has been supposed to be that of
tenant and landlord, the nature of the tenancy varying accord-
ing as we consider them before or after default in payment. It seems an erroneous view of the legal effect of the contract,
and the supposition of a tenancy is perfectly useless for the
explanation of the rights either of the mortgagor or mort-
gagee, which are determined by the instrument of mort-
gage, and by the well-established jurisdiction of courts of
equity in matters of mortgage.

From the time of default being made, the several inte-
rests of the mortgagee and the mortgagor in the land must
be considered as chiefly belonging to the jurisdiction of
equity. When the mortgagor, default of the mort-
gagor, has become the absolute legal owner of the lands,
the mortgagee possesses what is called the equity of re-
demption. This equity of redemption is considered by courts
of equity as an equity in equity; it is distinct from the
mortgagor, and, in case of his intestacy, it will descend to
his heirs; it may be sold, or it may be mortgaged; it is
subject both to dower (in equity, by 3 and 4 W. IV., c. 105)
and curtesy; and it may be settled like a legal estate.

By a recent statute (3 W. IV., c. 26,) made for the purpose of
explaining the statute of limitations (3 & 4 W. IV., c. 27),
it is enacted, That any person entitled to or claiming under
any mortgage of land (as defined by the last-mentioned act)
may make an entry or bring an action for the land, or suit in
equity, to recover the same or any interest therein, at any
years next after the last payment of any part of the principal
money or interest secured by such mortgage, although
more than twenty years may have elapsed since the time at
which the right accrued, in such suit or action, suit in equity
shall have first accrued. This act was passed to protect the mortgagor who allows the mortgagor
to continue in possession of the land or in the receipt of the rents and profits; and it secures to him his rights for twenty years after the last payment of principal or interest by the mortgagee. By the 3 & 4 W. IV., c. 27, when a mortgagee has possessed of the land, or any interest therein, or the person claiming through him, can only bring a suit to redeem the lands within twenty years next after the commencement of such possession or receipt, or within twenty years from the time when the mortgagee or his assigns, or the person claiming through him, in writing to the mortgagee, or some person claiming his estate, or to the agent of such mortgagee or person, his title of mortgage or right to redemption. The mortgagee, or the person claiming under him, may therefore, at any time within the years above named, tender to the mortgagee his principal money and interest, and claim a reconveyance of the lands; and if the mortgagee will not accept the tender and reconvey, the mortgagee may compel him by filing a bill in equity for the redemption of his lands.

A mortgagee can transfer his mortgage to another. The transfer or assignment, as it is generally called, consists of two parts expressed in one deed, the transfer of the debt, and the conveyance of the land, which is the security for the debt. If the mortgagee is a real person, the assignee takes the mortgage exactly on the terms on which the assignor held it at the time of the assignment. If the mortgagee, or the person claiming through him, was in possession when the mortgagee transferred it to the assignee, the assignee is entitled to any rents and profits which the assignor had at the time of the assignment, as the assignor was at that time entitled to them.

If the principal money and interest are not paid at the time agreed upon, the mortgagee may file a bill of foreclosure against the mortgagor. By such bill, the mortgagee calls on the mortgagor to redeem his estate forthwith, by payment of the principal money, interest, and costs; and if the mortgagor does not do this within the time named by the decree of the court (which is generally within six months after the master in chancery has made his report of what is due for principal, interest, and costs), he is for ever foreclosed and barred of his equity of redemption, and the mortgagor becomes the owner of the land in equity, as he would have been if the mortgagor had at the time mortgaged the mortgagee must reconvey the land, and deliver up to the mortgagor all the deeds and writings in his possession relating to the land.

The mortgagor and mortgagee are living at the time when the lands are redeemed, and nothing has been done by either party to assign or transfer his interest to any other person, the transaction is a very simple one: the mortgagor pays his debt and interest, and the mortgagee reconveys the land. The settlement of accounts between the mortgagor and mortgagee may be rendered more difficult by the circumstance of the mortgagee having received the rents, for which the decree for redemption provides that he must account. It may however happen that the mortgagee is in the flame, or has several disposers of their interests in the lands, or all these events may have happened, which renders the settlement much more complicated.

The mortgagor and mortgagee are being dead. As every mortgage transaction implies a debt from the mortgagee to the mortgagor, which he is bound to pay, even if there are no covenants for payment in the mortgage-deed, it follows that, according to the general rule of law, the mortgagee is in the flame, or has several disposers of their interests in the lands, or all these events may have happened, which renders the settlement much more complicated.

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purchased the equity of redemption, his personal estate is not liable to pay the mortgage debt; but the person who derives his title to the land from such intestate, devisee, or purchaser, must take it subject to the burden of the mortgage deed.

When a mortgage deed contains a power of sale, which is exercised in the lifetime of the mortgagee, the surplus money is personal estate; but if the sale is effected after the mortgagee's death, the money belongs to his heir or devisee.

The person entitled to receive the debt is the administrator or executor of the mortgagees; for, as already observed, the land is only considered as a security for the debt, which the mortgagee has bound himself to pay out of the lands; and it is subject to be sold to pay the mortgagee's expenses, or to pay to the mortgagee, his executors, administrators, and assigns. Thus whether the mortgagee dies without having or after having assigned his mortgage, the money is a debt due to the personal representative of the mortgagee, or to his assignee, or to the personal representative of the assignee, if the assignee is dead. When the debt is received by the person entitled to receive it, the person who has the legal ownership of the land, whether he be heir or devisee, is bound to convey it to the person entitled. This is the general rule, but it is subject to a few exceptions, which depend on particular circumstances. Thus a mortgagee of the equity of redemption will be postponed, as to his security, to a subsequent mortgagee who has advanced his money without notice of the prior mortgagee; if such subsequent mortgagee should be able to obtain the legal estate.

If a second mortgagee obtains the title-deeds of the estate, this will not give him a preference over a prior legal mortgagee, unless the prior mortgagee has parted with or failed to get possession of the title-deeds for fraudulent purposes, or through gross negligence. But though the second mortgagee has no priority, when there is neither fraud nor negligence, he will not be compelled to give up the title-deeds of the estate, unless the first mortgagee pays him his debt and interest.

A legal mortgage is effected by an instrument which transfers the legal estate. When a mortgagor makes a personal mortgage, and uses the form of a legal conveyance, this is also called a legal mortgage, though there is no necessity of any legal estate, for the legal estate is already conveyed to another person. This kind of mortgage may be called a mortgage of an equity of redemption, by way of distinguishing it from the equitable mortgage next mentioned.

An agreement in writing to transfer an estate as a security for the repayment of a sum of money, is called an equitable mortgage, because it gives the intended mortgagor a right to have a legal mortgage, and in a court of equity gives him the act of a legal mortgagee, and the right to the title-deeds of an estate, or of the copy of court roll, as a security for a debt contracted at the time of the deposit, or previously to the deposit, constitutes an equitable mortgage.

An equitable mortgage by deposit of title-deeds, has a preference over a subsequent personal mortgage, or can obtain possession of the legal estate with notice of the equitable mortgage.

If the mortgagee is not seised in fee, but has only a limited interest in land, as a lease for years, the mortgagee, by his mortgaged interest, is in the flame, and as such liable to the same rules as the mortgagor is in respect of covenants, and the same rules apply to the equitable mortgagee as well as to the mortgagor. If the mortgagee mortgaged land, and the equitable mortgage is not liable to such covenants (Moore v. Chaur, 8 Sim., 590; and so the matter stands at present.)
The preceding remarks apply to mortgage of land only, in which there are particular advantages from the condition of legal ownership of land in this country. But other kinds of property may be mortgaged, such as chattels personal, a life-interest in a sum of money, or a policy of insurance, or a ship, or shares in a ship. The subject of pawnage or lending of goods under Pleadings, and also the rules of the Roman law as to Hypotheca and Pignus. The equitable lien on land, which is classed among mortgages by some writers, is briefly noticed under LEASE; and mortgages of ships under SHIP.

MORTIFICATION (in Medicine) is the death of any tissue. It may occur from a variety of causes, as intense inflammation [INFLAMMATION], or from anything which is connected with Romey, obtained from the Society for the Encouragement of Arts a premium of fifty guineas, and that of St. Paul preaching to the Britons one hundred guineas. He was further distinguished by the notice and friendship of Reynolds, which friendship has been attributed not to Reynolds' disposition of art, but to the fact that Mortimer was a patron and a taste for art, of which he is supposed to have acquired from an uncle who was an itinerant portrait-painter, he was, at the age of eighteen or nineteen, placed under Hudson, who had been the master of Roman Fontaine, a favorite of Reynolds. He was in the habit of painting historical subjects, and as such, as in historical subjects. His groups of bandits are masterly; and his "King John signing Magna Charta," The Battle of Agincourt, &c., show him to have possessed great and original power in the higher walk of art; and in his knowledge of the human figure he has rarely been surpassed. The "Brazen Serpent in the Wilderness," in the great window of Salisbury cathedral, and the cartoons for that in Brazenose College, Oxford, were designed by him.

Mortimer was a baronet, his figure of athletic mould, and his constitution was naturally very strong, but he greatly impaired it by the excesses of what is called free living. About the year 1775 his health began to decline, his former exuberant gaiety abandoned him, and he became languid and melancholy; but though he was not actually recovered, and was able to employ his pencil both industriously and profitably, realising by it nine hundred pounds in the course of a single year, his life was soon cut short, for he died on the 4th of February, 1779, in the 59th year of his age, buried in the churchyard at High Wycombe, near the altar; where is his painting of St. Paul preaching to the Britons.

MORTMAIN. By the 9 H. III, c. 36 (Magna Charta), it was declared that it should be not lawful for the King to mortgage any land to a religious house, so as to take it back again and hold it of the house; and any such gift to a religious house was declared to be void, and the land forfeited to the lord of the fee. The reason of this provision is obvious, if we consider the nature of the feudal tenure; and indeed it is directly expressed in the preamble of the statute of the 1 Edward I, sometimes entitled De Religiosis, as follows: "Whereas of late years it has happened that religious men should not enter into the fees of any without the licence and consent of the chief lords (capitulum dominorum) of whom such fees are immediately held; and whereas religious men have entered as well as others into the tenure of the others as of those others, by appropriating them to their own use and buying them, and sometimes receiving them of the gifts of others, by which means the services due from such fees, and which were originally provided for the defence and support of the state, are thereby lost to the crown and lords lose their escheats of the same," &c. The statute then forbids any religious person or any other to buy or sell lands or tenements, or under colour of a gift or term of years, or any other title whatever, presume to receive from any one, or by any false device or pretended service, or any other means, to appropriate to himself lands or tenements, so that such lands and tenements come into mortmain in any way (ad manum mortuum deveniant), under pain and forfeiture of the same.

The statute then provides, that if it is violated, the lord from whom the lands are held may enter within a year; or if he neglect to enter, the next lord may enter within half a year; and if all the chief lords of such fees, being of full age, within the four seas, and out of prison, neglect to enter, the fees and rents shall be conveyed to the crown.

The general notion of mortmain may be collected from the words of this statute, the term being used to express lands belonging to any corporative body, ecclesiastical or temporal, sole or aggregate. Various explanations have been offered as to the reason of this provision of this statute. Some think it was to keep in mortmain, or in mortua manu, that is, in a dead hand. Under the feudal system lands held by any corporate body or person might not appropriately be said to be in a dead hand, for as mortmain is often applied to perpetual continuance and succession, the lord lost the rents in his lands, which under the strict system of tenures, he derived either from the services of the tenant, while alive, or from the death of the tenant and other circumstances incident to such event. Accordingly the best explanation of the meaning of this term seems to be that offered by Coke, that "the lands were said to come to dead hands as to the lords, for that by alienation in mortmain they lost wholly their escheats, and in effect their tenants' services for the defence of the realm, wars, marriages, rentals, and the like, and therefore was called a dead hand, for that a dead hand yieldeth no service." Similarly, the old mortmain vadeum seems to have been so called, because the land in pledge was for the time dead to the pledgee. [Mortom: 8. 5.]

Before the 9th Hen. III., c. 36, which was designed to give or sell his lands to religious as well as any other persons, unless it was forbidden in the gift of the lands to the religious. Accordingly the great lords, on making a grant of land, could not afterwards transfer the same by gift or by bequest to religious and also to Jews: Licium sit donatorio rem datam dare vel vendere cui volueris, exceptas viribus religiosis et Juda. (Bracton, fol. 13.)

This statute of Edward I. prevented gifts and alienations between corporative bodies or persons, and was by a new device, apparently invented by the clergy, and probably most used by the religious houses. These bodies, pretending a title to the land which they wished to acquire, brought an action for it by a Francique qui redit et reperit in the tenures against the tenure of the lands acquired by the religious house had judgment, and entered on the land.

The statute of the 1 Edward I. (Westminster), 2. c. 32, provided against close recoveries of lands obtained by clausulation; for it was enacted, that after the default made, it should be inquire whether the demandant had any right in demand or not; and if the demandant was found to have no right, the land was declared to be forfeited to the state. This statute mediate, similar to that of Edward I. Another provision of this statute (c. 33) furnishes curious evidence as to the devices practised for the purpose of eluding the statute of mortmain. The words of the enactment will best explain the statute, or as much as is necessary:

* Vines (art. "Mortmain"), quoting Coke, who writes this passage: "Licium sit donatorio rem datam dare vel vendere cui volueris, exceptas viribus religiosis et Juda. (Bracton, fol. 13.)"
dies of their lords, in order that the tenants may defend themselves by the privileges of Templars and Hospitalizers against the encroachments of the forest. But no legal estate be forfeited to the chief lords, or to the king, in the same way in which it is enacted elsewhere with respect to tenements alienated in mortmain (‘de tenementis alienatis ad mortem’).

Various other statutes were passed in the reigns of Edward I. and Edward III. relating to mortmain; but the most important statute is that of the 13 Richard II., c. 5. As corporations could not acquire lands by purchase, gift, lease, or otherwise, the only way in which they could ever become the main benefactors of or mainly practised by ecclesiastical bodies or persons. The device consisted in this: the lands in question were conveyed to some person and his heirs to the use of the ecclesiastical body or person and their successors. In this way the legal estate was not in the possession of those who could not legally hold it, but in a person who had such legal capacity; and the use or profit of the land, the beneficial interest in it, was secured to the ecclesiastical body or person, contrary to the spirit of the previous statutes, though not contrary to their expressed provisions. The statute of Richard II., after declaring that this use was also mortmain, further declared all such conveyances to be void, and that the lords might enfeoff the land, or enfeoffed the land to the use of the Dei Regis. This distinction of the ownership of land into the legal and beneficial was undoubtedly derived from the clergy from the like distinction in the Roman law between Quiritarian and Bonitarian ownership, which is briefly and distinctly expressed by Gaius (ii. 40).

Though the statute De Regiis was in its terms comprehensive enough to include all alienations to corporate bodies or persons, it is clear that this statute was mainly directed against the corporation of the foresters, that ecclesiastical corporations were more numerous than any other, and had been more active in getting lands into their hands. This statute of Richard II. however expressly extends the definition of all such exchanges to the lands of gilds or fraternities; from which it has been inferred that the doctrine of mortmain had not, before the date of this statute, applied to gilds or fraternities. The statute De Regiis is by this statute of Richard II. expressly declared to apply also to what we now call municipal corporations, and the statute places such bodies in all respects on the same footing, as to the purchase of lands, with ‘people of religion.’ If such bodies as these had been considered within the statute De Regiis, it seems clear from the statute of Richard II. that all such exchanges of lands and hereditaments for stocks in the public funds, securities for money, or any other personal estate whatsoever, to be laid out or disposed of in the purchase of any lands, tenements, or hereditaments, shall be given, granted, aliened, limited, released, transferred, demised, or appropriated, and not to be settled to or upon any person or persons, bodies politic or corporate, or otherwise for any estate or interest whatsoever, or any ways charged or encumbered by any person or persons whatsoever, in trust or for the benefit of any charitable uses whatever, unless such gift, conveyance, appointment, or settlement of any such lands, tenements, or hereditaments, sum or sums of money, or personal estate (other than stocks in the public funds), be made by deed indented, sealed, and delivered, in the presence of two or more credible witnesses, twelve calendar months at least before the death of such donor or grantor (including the days of execution and death), and be enrolled in His Majesty’s High Court of Chancery within six calendar months after the death of the donor or grantor; and that all such gifts, conveyances, or other transfers of stocks, six calendar months at least before the death of such donor or grantor (including the days of the transfer and death); and unless the same be made to take effect in mortmain and incorporeal hereditaments, and so that what relates to the time before the grantor’s death for sealing the deed and making the transfer shall not extend to any purchase to be made really and bona fide for a full and valuable consideration, actually paid at or before the making of such conveyance or without fraud or
It should be borne in mind that the terms charities and charitable uses have a legal meaning very different from the popular meaning of the term charity.

The great mass of property in England and Wales which is appropriated to charitable uses, and the importance of many of those establishments which are supported by such property, render it necessary to give some exposition of the nature of the legal and technical phraseology, which is most conveniently done under the head of Use.

Charitable.

The term Mortification in Scotland expresses pretty nearly what mortmain does in England.

According to Sir Robert Anderson (ed. Brodick), ‘infeftments of mortified lands are those which are granted to the kirk or other incorporation having no other reddendo than prayer and supplications and the like; such were the mortifications of such lands granted by the king to kirkmen, or granted by other private men to the provost and prebendaries of college kirkfs founded for singing; or to chaplainies, preceptories, altarnes, in which the patronage remained in the mortifiers.’

The act of 1587, c. 29, passed in the Eleventh parliament of James VI., was by effecting that the king ‘and his three estates of parliament perforet understood the greatest part of his proper rent to have bene given and dispounded of auld to Abbeis, Monasteries, and otheris persons of Clergie, &c.: it further recited that ‘his nobilitie and subiects was nawais minded to greeve them with unprofitable taxations, specially for his royal support.’

The act then went on to declare that it was ‘founde maist meete and necessarie for the land and expectances that we all have recourse to his awin patrionme dispounced of before (the reason causit by the present slow freezing) as ane helpe maite honorable in respect of himself and least grievous to his people and subiectes.’

The act then proceeded to unite and annex to the crown (with the exceptions after specified in the act) all the lands, &c., belonging to the ecclesiastical and religious personages therein mentioned. This act was in effect more extensive than the similar acts of Henry VIII. in England.

Since the Reformation, lands given in Scotland for charitable purposes still continue to bear the same title of the charity, which can be held either in blench or feu holding. (Bell’s Dict. of the Law of Scotland.)

MORTON, JAMES DOUGLAS, Fourth Earl of, and Regent of Scotland, was a younger son of the great family of Angus, which, besides other honors, had more than once held the office of lord-high-chancellor of Scotland, and by the marriage of the sixth earl of Angus with Margaret of England (widow of King James IV.) had recently been restored into the highest position in state. The third brother of that princess. Morton was nephew to the above earl, being second son of the earl’s younger brother, Sir George Douglas of Pittendreich. These two brothers had mutually assisted each other in their struggle for power and influence during the minority of James V., and in the fall of 1528, Sir George fled and remained an exile during the remainder of James’s reign. He then returned to his native country, and in 1543 was appointed a privy-councillor to the Regent Arran.

Previous to this period, but at what precise time is uncertain, the younger son of Sir George had married Lady Elizabeth Douglas, daughter of the third earl of Morton, by a natural daughter of King James V.; and on that occasion the earl, having no male issue, obtained a new reversionary clause to his patent, transferring the earldom to this fortunate son-in-law. In consequence of this provision he was styled the Master of Morton; and on his father-in-law’s death, in 1553, he became earl of Morton. Up to this time he followed the ordinary professional course of a lawyer, but in the summer of 1555, on receipt of a confidential letter from the Earl of Huntly, describing Morton as ‘a simple and fearful man.’ From the time of the queen’s reign’s death however that description was inapplicable to him; and on the 7th January, 1563, he was constituted lord-high-chancellor of the Kingdom, in the room of the forfeited Earl of Huntly, who
had been the great head of the Catholic party in Scotland. He had been only a few years in that office however when he was obliged to lay it down, and fly into England, on occasion of Rizzio's murder, in which cruel and lawless affair he took an active and prominent part. He remained in England, under the protection of the English monarch, till the end of the year 1584, when he was restored to Mary's favour by the intercession of Bothwell, whose ambitious designs needed all the aid which could be drawn together from every quarter. Bothwell soon opened to him the plot which he cherished for the capture of Darnley, expressed his acquiescence. In this however Bothwell was mistaken; Morton refused to concur. But neither did he inform Darnley of the plot, nor take any measures to prevent its being executed; and he was one of those who subscribed the letters which affected Bothwell, and thus assisted the character of the one being concerned in the murder, and to use every endeavour to promote his marriage with the queen. Yet when this latter event took place, and when Bothwell became odious to the nation, Morton was the great leader in opposition to him; and was to the castle of his relatives, the lady of Lochleven, that Mary was conducted when she delivered herself up at Carberry Hill. When Mary was securely lodged in this place of confinement, the earl of Murray, president of the kingdom, was instituted in the office of lord chancellor. He continued in this situation during the regencies of Murray, Lennox, and Mary, and was indeed a principal actor in all matters of importance which took place in their reign; and on Mar's death in the year 1587, Morton was himself made regent of the kingdom. Here his ability and vigour indeed, but at the same time his ambition, his avarice, and rapacity, and his general want of principle, became apparent to all; he was now at once feared and hated; and finding himself offending the nation to the point of concurrence in the idea of retrieving his reputation by resigning, or rather offering to resign, the government into the king's (James VI.) own hands, his majesty being now in the twelfth year. Accordingly on the 24th September, 1587, in the whole regency of the queen, and the advice of Athol and Argyl, accepted it, to the great joy of the people. Morton, thus unexpectedly taken at his word, retired in a sort of pet to Lochleven, which, from his formidable character, was then commonly called the Mary's Tower, and from hence he watched a favourable moment to regain his power. An opportunity presented itself, and he immediately became master both of Stirling Castle and of the king's person. He then resumed power, and by the help of Queen Elizabeth retained it for some time. Among other things, he secured the marriage of his cousin, Lady Stewart, who, as Robertson says, shunned no action however desperate, if it led to power or favour, charged him, in the king's presence, with being accessory to the murder of Darnley. Upon this charge Morton was committed first to his house, then to the castle of Edinburgh, (2nd January, 1581), and then to Dumbarton, of which Lennox, the father of Darnley, had the command. Elizabeth used every endeavour in favour of Morton, but the greater the solicitude and more the pains taken to save his safety, the more his enemies urge his destruction; and being carried by Captain Stewart, then earl of Arran, into Edinburgh, he was, on the 1st of June, 1581, brought to trial, found guilty, and condemned. When that part of the verdict was read which, besides finding that he had concealed, found that he was also accessory to the murder, he repeated the words with vehemence, and then exclaimed, 'God knows it is not so.' The next morning, speaking of the crime for which he was condemned, he admitted that on his return from England, after the death of Darnley, Bothwell had suspected him of the conspiracy against Darnley, which the queen, as he told him, knew of and approved, but that he had no hand in it. And as to revealing the plot, 'To whom,' said he, 'could I find that he had concealed, found that he was also accessory to the murder, he repeated the words with vehemence, and then exclaimed, 'God knows it is not so.' On the scaffold his behaviour was calm, his countenance and voice unaltered, and after some time spent in his devotion, he was beheaded by the instrument called the Maiden, on the 3rd June, 1581. His head was placed on the public gallows; and his body, after lying till sunset on the scaffold, covered with a beggarly cloak, was carried by common porters to the usual burial-place of criminals. None of his friends accompanied it to the grave—they did not feel at leisure to show the gratitude or respect by any expressions of sorrow. Public opinion was unanimous in his condemnation.

MORTON, JOHN, cardinal and archbishop of Canterbury, was the eldest son of Richard Morton, of Milbourne in Buckinghamshire, by his wife Margaret, who, by the marriage of her father, became co-heiress of the landed estate of the district of Stow in the same county, in 1410. He received his earliest education at the abbey of Cerne, whence he removed to Balliol College, Oxford. Of his progress in that university we know but little, till he became principal of Peckwater Inn. His name was not there at the time of the Reformation. He had been recommended to the notice of Cardinal Bourchier. The cardinal, beside conferring upon him various preferments, introduced him to King Henry VI., who made him one of his privy-counsels. He adhered to this unfortunate prince with so much fidelity, that even his successor Edward IV. could not but admire his attachment, which he rewarded by taking Morton into his councils. In 1473 Morton was appointed master of the rolls; and between this time and 1483 he was selected, along with the other bishops, for the office of cardinal. The preferments in different quarters of the kingdom proved the high esteem in which he was held. In 1476 Edward IV. made him bishop of Ely and lord chancellor of England, and at his death appointed him one of his executors. He was examined by the house of Peckwater in 1478, and at the same time that Lord Stanley was arrested, gave Morton in ward to the duke of Buckingham. He escaped however from the duke's castle at Brecknock, and concealed himself for a time in the Isle of Ely; soon after which, passing in concealment to Ireland, he joined the commons in that kingdom, and is said to have been the person who first proposed the coalition of the two houses of York and Lancaster by the marriage with the eldest daughter of Edward IV. As soon as this was done, and Henry VII. was elected, the cardinal was made one of his privy-counsels, and on the death of Cardinal Bourchier, in 1486, joined with the pope in promoting him to the archbishopric of Canterbury. In August, 1487, if not earlier, he was again constituted lord chancellor, and in 1493 created a cardinal by pope Alexander VI. He died September 13th, 1500. Morton was a man of great talents, learning, and probity. The cut or draw from Peterborough to Wisbech, known by the name of Morton's Leaze, was made entirely at his expense while he was lord chancellor. He was the founder of that the English Life of Richard III., usually attributed to Sir Thomas More, was really written by Morton. (Tanner, Bibl. Brit. Lb. pp. 532, 533; Bentley's Hist. of Ely, 4th Ed. 1719, p. 179-181; Chalmers' Br. Dict., II., p. 236.)

MORTUARY, from the Latin mortuus, dead, and mortuo, ancestor called paul-yeaste, soul-shot, or money paid at death. The mortuary was really a gift left by a man to his parish church, as a recompense for his personal tithes and offerings.支付的牧师, affection.

Mortuary, in the 'History of Worcestershire,' p. 679, enters minutely into the reason and occasion of such bequests, the earliest mention of which he finds in the 'Council of Alnham,' in the year 1069, and in the 'Laws of King Canute.' Mortuaries were afterwards distinguished into dead mortuaries, and mortuaries even live mortuaries: the former consisting of money, or any other goods or chattels; the latter of live stock: Blount says the second-best boast, after the first had been paid to the lord for his heriot. After the Conquest we find the mortuary system extended. In 1222, Henry III. ordered that the body of John, earl of Cornwall, was presented with the body at the funeral. John Arden, in his will dated 4th of June, 17th Hen. VIII., says, 'Item, I bequeath for my mortuary, or cory-presente, a black gelding ambling, that Almighyt God may therewith take me unto him unspotted and worthy. And all the antient wills from the time of Hen. III. to that of Hen. V., in which horses, caparisoned and bearing the military weapon of the defunct, are directed to be led before the corpse at the head to the funeral, is the origin of the practice of leading horses at the funerals of persons of distinction. Mortuaries, in time, were found oppressive to the yeomanry and poorer inhabitants of parishes: they were regulated, and converted into a money payment for the government, under licence of the archbishop of Canterbury, in 1530.
that a mortuary was sometimes paid to the lord of a sea, as well as to the priest of the parish.

MORVAIR. [GUYTON DA MORVAIR.]

MORUS ALBA, or the White Mulberry, is a native of China, where it forms a small tree, and whence it has been gradually carried westward, till it has become a common plant in most of the temperate parts of the Old World, forming in the south of Europe a pollard-tree by road sides. Its leaves are consumed, and its shoots are eaten raw, or pickled. The base, and on old trees ovate or oblong, but on young vigorous shoots as frequently divided into deep lobes. The fruit is white, insipid, and of little value, except for feeding poultry. In this country it is seldom formed. It is on this species that the silkworm is chiefly fed; and in silk countries many varieties are cultivated for the purpose, some of which are said to be much better than others. The common wild kind is said to suit the silkworm as well as or even better than any kind; but as it yields only a small quantity of foliage, compared with other sorts, it is principally employed as the source of seeds from which stocks are raised for grafting more productive varieties. Of the latter each silk country has its own fancy kinds, which the silkworms are not fed except in cases of very pure silk. It is among them an exception of importance, the value of which has been recognised wherever it has been cultivated. Some years since a mulberry was introduced into France from China. The Chinese form of Morus Alba, the India Mulberry, the great excellence of which seems universally acknowledged. It has straight smooth branches, oval heart-shaped leaves tapering to a point, thin, rather soft, a little blistered and puckered in the middle, often drooping, and resembles, more than any variety, an evergreen. It is peculiar to the dry climate of the south of France. It grows much faster than the white mulberry, and strikes from cuttings as freely as a willow, which is not the case with the latter. The abundance of its leaves is much greater than any other kind. It is sometimes termed the Chinese by some; but the seerener gives his work many specimens of the kind, and among others one from a pavement in the baptistery of Pisa (begun in 1553), which is remarkable, as the compartments form precisely the same pattern as that of the window in the mosque of Hafsin at Caire. The pattern, in cuttur, 363, in *Morish Architecture*. In the pavement the lines are a dark green on a white ground, and the spaces, which are perforated in the window, are filled up with cinnabar-colored stones of different shapes and colors, placed alternately upon a dark and a white ground.

Moriscos of this description, that is, for pavements, generally consist only of a series of ornamental borders enclosing one or more compartments containing some figure or design, or occasionally a group or subject. Others consist entirely of a pattern generally in small colored compartments in three—black, white, and red. Examples of pavement mosaics in each of these modes have been discovered at Pompeii, and in many of them the borders very much resemble those upon Greek tile vases.

Mosaic continued to be used both for pavements and ornamenting walls to a late period in the middle ages, and was greatly practised in Byzantine buildings, and by Byzantine artists, who were also employed in Italy, whence it was gradually transferred. Sometimes the name of Byzantium is given to these mosaics. Often the same pattern is repeated, and the mosaics in the church of St. John Lateran; and it is remarkable that in their geometrical patterns and devices they display a taste very much akin to that of Arabian architecture. [Morish Architecture.]

Beautiful specimens of decorative mosaic or intarsia pavements, in a different style from the preceding, occur in the church of San Miniato at Florence, consisting of squares filled up with bold foliage or flower-work in black and white, and which again partake not a little of the character of corresponding decoration in the Moorish and Arab styles. Patterns very similar to those of such mosaics were also frequently employed for painting walls, of which kind specimens from the church of San Francesco at Assisi, as well as others in mosaic in the same building, may be seen in the [Pavements in Southern] Arabisch and Al-Italische Bau-Ferrungen.

Something akin to mosaic or coloured inlaid-work was occasionally employed in Italy during the middle ages for external decoration, and the short notations of the bethel of the Duomo at Pisa may be mentioned, where, though the pattern is chiefly in black and white, brilliant reds and blues are intermixed at intervals, a species of external decoration supposed by some to have been derived from the practice of *polychromy* among the Greeks. [Polychromy.]

Although nearly similar as to their process, mosaic pictures, especially some of those of later times, may be considered as a distinct branch of the art. Whether actually employed as pavements or inserted in walls, mosaic of the
class just described consisted chiefly of ornament and pattern, executed in few and simple colours, with hardly any attempt at 'expressing objects suggested in them, even in the figures, human or animal, occasionally introduced in them. The outlines are everywhere distinct and hard; the joints between the tesserae, or separate pieces of material, plainly visible; in short, there is no attempt at pictures; scarcely anything more, in fact, than the suggestions of them, if we may so express it. All these however are rather proprieties than defects, because a direct imitative imitation of nature—any picture, according to the modern idea of the term—would be altogether out of place in a bis of that nature, or in the ornamentation of a pavement or floor. Even for ceilings they are objectionable enough, but for floors pictures would be almost intolerable. It has been conjectured by some however that mosaic-work first suggested the idea of painting, or, in other words, that the presence of a painted surface was an unconscious imitation of the mosaic, and consequently followed upon a plane surface, and confining the composition to figures alone, without any intermixture of pattern-work or arbitrary ornament; and if founded upon nothing better than conjecture, such supposition is highly plausible, the transition from the one to the other being both obvious and easy. Further, such hypothesis is greatly strengthened by our finding that nearly all the specimens of antient painting which have been preserved to us or yet discovered have been made in imitation of the character of mosaic, and but a partial imitative imitation of nature, the figures being in many of them upon a uniform ground, and very few indeed exhibiting more than a partial background and a few indications of character.

For a long period after the decline of the arts, mosaic continued to be employed in Italy, both externally and internally, for the decoration of churches, as for instance, on the façade as well as within the basilica of St. Mark at Venice. Some have supposed that such productions were entirely the work of Byzantine or Greek artists, but the contrary opinion is firmly maintained by Cicolan, who suggests that mosaic, as practised by native Italians, that it was well known to the earliest Venetians, and that consequently the work of the Venetians. Indeed if we suppose that a Florentine who lived in the thirteenth century, the first Italian who obtained instruction in the art from Greeks practising at Venice. The works however, both of Constantinopolitan and Italian, of those ages, are more curious than beautiful, rude and uncouth in design, and exhibiting very little of the principles of painting. In fact they bear a far greater resemblance in every respect to the glass-painting in Gothic windows than do to pictures, and the mosaic-work may itself be considered as a transparent mosaic-work. In neither case is a direct imitation of nature aimed at, but merely a sort of conventional and more or less symbolical representation. The outlines are hard and defined, the colours forebode and unbroken, nor is there any attempt at perspective; the manner of pictorial imitation is further repudiated by the figures being frequently represented upon a gold ground, a practice afterwards followed by some of the earlier German painters, and in the present day in some of the modern frescoes at Munich.

Pictures in mosaic are comparatively of recent origin, dating not further back than the commencement of the seventeenth century, when copies of celebrated works by Raphael and other masters were for the first time thus executed. Mosaics of this kind are facsimiles of the originals, and have merely the effect of paintings produced in the usual way, although attended with infinitely greater cost and trouble, and both more laborious and tedious in their process. As every separate piece of glass is of the same colour throughout, the graduation of tints, the melting off of any one colour from its highest light to its darkest shadow, can be obtained only by an immense number of small pieces, of which however each must either exhibit scarcely any perceivable difference to the eye. It is not however that no fewer than forty thousand different tints, all of which must be kept methodically sorted and arranged, are required for the work of mosaic-work; the preparation of such a palette therefore is a work of considerable expense. It must of itself be a task of great labour and time, as well as expense; besides which the execution is so entirely mechanical, that it is fit only for copies. The sole advantage it has is its degree of correspondence to the cost attending it, is the extreme duality of the work when once accomplished, as its colours can hardly be changed by any length of time; nor is it liable to the slightest decay, or any injury except what may happen to the structure in which it is fixed.

The mosaics in St. Peter's, which are chefs d'œuvre of their kind, will last as long as the building itself stands.

Similar mosaic is frequently employed, or rather missapplied, on a miniature scale, for pictures on the lids of snuff-boxes and articles of the like description; and on pieces, which are at the best mere curiosities and very laborious trifles. Florentine-work may also be mentioned as a species of mosaic, chiefly used for inlaying or veneering marble slabs for tables, and decorative purposes of that sort upon other objects.

The recent adoption of asphalt for pavements may perhaps lead to ornamental decoration for such purposes, somewhat in the style of mosaic in regard to patterns. The delight of the Byzantine artists in the Bassilica of St. Mark at Venice, ornamented in black and white, with compartments radiating from the centre; and such pavements certainly recommend themselves for conservatories, terraces, &c. Although mosaic itself is by far too expensive for any but very rare occasions, the effect of it may be obtained, and the beauty of its patterns produced, in stain-cloth flooring; and the same style of design might also be shown in carpets, and were these more sober in their colours, and more d'antique in their design, the furniture and other decorations of rooms would consequently be more in harmony with it.

MOSAIK, or MOSHAISK, is the chief town of a large circle of the same name in the government of Moscow. Stein, in 1820, assigns it to the government of Tvergou; but in 1812, all this southern part of Russia, place it in the government of Moscow. It is situated at the junction of the Moschuska and the Moskwa. It is chiefly celebrated for the events which took place in its vicinity in 1812. On the 7th September the French under Napoleon attacked the Russians, and were repelled with such a terrible blow that the whole of the French army was driven to the Moskwa. This engagement had a profound effect for many years. The whole of the town was reduced to ashes in the great conflagration which has since been rebuilt, and is much handsomer than it was before. The inhabitants, above 4000 in number, carry on a considerable trade in corn and timber.

MOSASAURUS, Mr. Conybeer's name for a gigantic extinct aquatic Saurian, Saurochampas of Wegler, considered by Faujas St. Fond to be a crocodile, but whose true position among the Saurians was pointed out by Camper. They abound in every country, and are especially rich in the English coal-beds, the Bunter, and the Bruche. The discovery seems to be one of the most important of the old toad. It is solid throughout, and joined to the sockets by a broad bone basis, the result of the hardening of the pulp from which the teeth were formed, and likewise attached to the jaw by ossification of the pulp that had furnished the enamel. This indurated bone is described as "a separate and independent bone," or "a Beringer bone," from the B fiance of Brusewater Trench, "passed like a circular buttress around the base, tending to make the tooth an instrument of prodigious strength. The young tooth first appeared in a separate form in the bone of the jaw, and moved irregularly across its substance, until it pressed against the bone, and was fixed in its place by the Beringer bone;" causing it gradually to become detached, together with its base, by a kind of necrosis, and to fall off like the horns of a deer. The teeth in the roof of the mouth are also conical, and attached to the principle with those in the jaw, and renewed in like manner.

The last-mentioned writer places its organization and its zoological and geological relations in so interesting a point of view in the treatise above mentioned, that we select his account as the best calculated to inform the general as well as the philosophical reader on these points.
The geological epoch at which the Mosasaurus first appeared, seems to have been the last of the long series during which the oolithic and cretaceous groups were in process of formation. In these periods the inhabitants of our planet seem to have been principally marine, and some of the larger creatures were Saurians of gigantic stature, many of them living in the sea, and controlling the excessive increase of the then extensive tribes of fishes. From the late upwards to the more recent formations in the chalk formation, the Ichthyosaur and Plesiosaurus were the tyrants of the ocean; and just at the point of time when their existence terminated, during the deposition of the chalk, the new genus Mosasaurus appears to have been introduced, to supply for a while the place of those forms of life which had given place to give place to the Cetaceae of the tertiary periods. As no Saurians of the present world are inhabitants of the sea, and the most powerful living representatives of this order, viz. the Crocodiles, though living chiefly in water, have recourse to stragium rather than speed for the capture of their prey, it may not be unprofitable to examine the mechanical contrivances by which a reptile, most nearly allied to the Monitor, was so constructed as to possess the power of moving in the water, with sufficient velocity to overtake and capture such large and powerful fishes as, from the enormous size of its teeth and jaws, we may conclude it was intended to devour. The head and teeth point out the near relations of this animal to the Monitors; and the proportions maintain the same relation to all the other Lizards that the Iguanodon warrant the conclusion that this monstrous Monitor of the antient deep was five and twenty feet in length, although the longest of its modern congeners does not exceed five feet. The head here represented measures four feet in length, that of the largest Monitor does not exceed fifteen inches. The most skilful anatomist would be at a loss to devise a series of modifications by which a Monitor could be enlarged to the length and bulk of a Grampus, and at the same time be fitted to move with such swiftness through the waves of the sea, but in the shell before us we shall find the genuine characters of a Monitor maintained throughout the whole skeleton, with such deviations only as tended to fit the animal for its marine existence.

The tail had scarcely any characters in common with the Crocodile, but resembled the Iguanodon in having an apparatus of teeth fixed on the pterygoid bone, and placed in the roof of its mouth, as in many serpents and fishes, where they act as bars to prevent the escape of their prey.

The other parts of the body of the Monitor are the characteristic of the reptile indicated by the head. The vertebrae are all concave in front and convex behind; being fitted to each other by a ball and socket joint, admitting easy and universal flexion. From the centre of the back to the extremity of the tail they are described in the paper of Linnæus as curving in a spiral so as to port the back of animals that move on land: in this respect they agree with the vertebrae of Dolphins, and were calculated to facilitate the power of swimming; the vertebrae of the tail allowed to that part also more flexibility than in the Crocodiles.

The tail was flattened on each side, but high and deep in the vertical direction, like the tail of a Crocodile; forming a straight bar of immense strength to propel the body by horizontal movements analogous to those of skimming. Although the number of caudal vertebrae was nearly the same as in the Monitor, the proportionate length of the tail was much diminished by the comparative shortness of the body of each vertebra; the effect of this variation being to give strength to an organ for swimming; and to increase the rapidity of movement, which would have been unattainable by the long and slender tail of the Monitor, which assists that animal in climbing. There is a further provision to give strength to the tail, by the chelon bone being solidly fixed to the body of each vertebra, as in fishes.

The total number of vertebrae was one hundred and thirty-three, nearly the same as in the Monitors, and more than double the number of those in the Crocodiles. The rib formation in these parts is similar to that of the Lizards. Of the extremities, sufficient fragments have been found to prove that the Mosasaurus, instead of legs, had four large paddles, resembling those of the Plesiosaurus and the Whale: one great use of these was probably to raise its body to the surface of the water to breathe, as it apparently had not the horizontal tail by means of which the Cetaceae ascend for this purpose. All these characters unite to show that the Mosasaurus was adapted to live entirely in the water, and that although it was of such vast proportions compared with the living genera of these families, it formed a link intermediate between the Monitors and the Iguanodon. However strange it may appear to find its dimensions so much exceeding those of any existing Lizards, or to find marine genera in the order of Saurians, in which there exists at this time no species capable of living in the sea; it is scarcely less strange than the analogous deviations in the Megalosaurus and Iguanodon, which afford examples of still greater expansion of the type of the Monitor and Iguana into colossal forms adapted to move upon the land. Throughout all these variations of proportion, we trace the persistence of the same laws which regulate the formation of living genera, and from the combinations of perfect mechanism that have, in all times, resulted from their operation, we infer the perfection of the wisdom by which all this mechanism was designed, and the immutability of the power by which it has ever been upheld.

Cuvier asserts of the Mosasaurus, that before he had seen a single vertebra, or a bone of any of its extremities, he was enabled to announce the character of the entire skeleton, from the examination of the jaws and teeth alone, and even from a single tooth. The power of doing this results from those magnificent laws of co-existence which form the basis of the science of comparative anatomy, and which give the highest interest to its discoveries.

The noble specimen from which the cut is taken was discovered in 1750, and is in the Museum at Paris. At the capture of Maastricht by the French army it was given up to them for the purpose of being reduced to a museum, according to Cuvier, by Goddin, dean of the chapter of that town, which, in virtue of some droits of the chapter, had taken it from Höffman, of whose collection it formed the principal feature. It is said that the French cannonners directed lines not to point their artillery towards that part of the town in which this precious specimen was deposited. Cassis are preserved in the British Museum, and in the museums of the Geological Society and of the Royal College of Surgeons.

Locality.—Maastricht, upper chalk in England (Mantell, near Lewes), green-sand of Virginia (Morton), Sandy Hook and Woodbury, New Jersey. [Maastricht Rock.] MOSCHATA, a name proposed by M. Renieri for a genus of Actinias, or soft Zoantharia, which a little resembles Holothuria, and lives in the sea, wherein it floats free.

Example, Moschata rhododactyla.

Locality.—Mediterranean and Adriatic seas.

MOSCHEROSCH, JOHANN MICHAEL, a German writer of the seventeenth century, generally known under the pseudonym of Philander von Sittwald, was born 5th of March, 1600, at Willstatt, a small town in Hanau-Lichtenberg, where his father was preacher. Respecting his life few particulars of any interest are known. An account of his life may be comprised in the statement that, after studying in Strasbourg, he filled successively a variety of appointments, until, in 1656, he was made president of the consistory at Hanau; and that he died, April 4, 1669, at Worms, while upon a journey to visit his son at Frankfurt on the Main.

As a writer he obtained much popularity in his time by his "Wunderliche und wahrhaftige Gesichte Philandors von Sittwald," in two vols. 1650, a collection of satirical pieces in the form of visions, a species of fiction greatly in vogue at that period as the vehicle of satire and allegory. Moscherosch may in fact be termed the German Quevedo, his "Gesichte" being to a certain extent a paraphrase of the Spaniard's Sueños, with adaptations to the manners and foi-
bliss of his own countrymen. Notwithstanding too that his style falls short of the concise terseness and energy which mark his original, he may be considered one of the best German prose-writers of the seventeenth century, gifted with great humour, and displaying not only considerabile knowledge of the world, but also great force of satire and ridicule, both serious and comic.

**MOSCHIDÆ.** a family of ruminant quadrupeds familiarly known as *Musk Deer.*

Linnaeus defines the genus *Moschus,* which he places between the Cervides, under his Order Pecora. The species having no horns, and the upper canine teeth solitary and exserted—Cornua nulla. Dentes Lanarii superiores solitarii existunt.1

Pennant, in the Systematic Index, gives it nearly the same position, the only difference being that the Deer precedes it, and the Camel follows it.

Cuvier, in his last edition of the 'Règne Animal,' gives it the same position that Linnaeus assigned to it; the Llamas (among the Camels) immediately preceding it, and the Deer (Cervus, Linn.) being next in succession to it. The French zoologist states that the Musks are much less anomalous than the Camels, and only differ from other Ruminants in the absence of horns, in having a long canine tooth on each side, which is called the Jax, which comes out of the mouth in the males, and finally, in having in their skeleton a slight fibula, which has no existence in the Camels. He adds that they are charming animals in regard to their elegance and lightness. The distinction of the exserted upper canine teeth, by Cuvier, is confined to the Musks; such a conformation exists in some of the males of the Ceroides, the Munjak for instance.

Mr. Swainson is of opinion that the Moschidae, or Musk Deer, constitute the most aberrant group of the Ruminants, and distinguish themselves from the Cervidae and Camels, the last family being the terminal grouping of his fourth tribe, or Ruminants. M. F. Cuvier enumerates Moschi moschiferus, Memmania, pygmaeus, Javanicus, and Napa, as the only species known at present.

Mr. Gray, in his *Disposition of the Mammalia (Annals of Phil., 1825)* divides the family into two sections, the first with persistent horns, and the second with either no horns or small ones. He divides the-claigs, and arranges it between Camelina and Cervina, in the second section. The genera of Moschina, in this arrangement, are Moschus and Memmina. The same author, in June, 1836, read to the Zoological Society of London, the following note on the genus Linnaeus, with descriptions of two new species.2 He remarked that the only character by which this genus, as established by Linnaeus and others, differs from the genus Cervus, consists in the absence of horns; for the elongated canines are concealed in the maxillaries of both the Indian species of Moschina, especially the Cervus Majtach. [DEER, vol. 84, pp. 362, 363.]

The character of the fur, the degree of hairiness or nakedness of the metatarsus, and the presence or absence of the musk-bag of the male, offer, however, he observed, good characters for the subdivision of the group into three very distinct sections or subgenera.

The first of these divisions, for which Mr. Gray would retain the name of Moschus, comprehends only the Thirteen Musk, Moschus moschiferus, Linnaeus. In course of time and Antelope, it has, he pointed out, the hinder and outer side of the metatarsus covered with close short hair, and, like many of the Deer also, its fur is quill-like and bristly; it is also very sensuous, being covered with scent, and the males are provided on the middle of the abdomen with a large pouch secreting musk. Its young, like those of most of the Deer, are spotted, whilst the adult animal is plain-coloured.

Mr. Gray further stated that the division to which, in the year 1821, in a paper in the 'Medical Repository,' he gave the name of Memmina, also consists of but a single species, the Moschus Memmina, Linnaeus. In this group the hinder bone of the metatarsus, in he observed, covered with hair; and there is no musk-bag in either sex. The false hoofs, he remarked, are distinct, although Linnaeus and Buffon denied their presence.

The third and last subdivision is characterised by Mr. Gray, under the name of Tragulus, having the hinder edge of the metatarsus nearly bald and slightly callosus, a character which distinguishes them at once from all other Ruminants; the fur is soft, and adpressed like that of Memina, but not spotted even when young; the throat is provided with a somewhat naked, concave, sub-glandular, callosus disk, placed between the rami of the lower jaw, from which a string of the metatarsus leads to the posterior plumes; and they have no musk-bag. Like all the other species of the Linnaean genus Moschus, they have false hoofs; and almost them have the edges of the lower jaw, three diverging bars on the chest, and the under surface of the body, manner it serves to place the species of this division: they differ in colour in the various stages of their growths, the young fawn resembling the adult in every particular except in size.

In this division, the synonymy of which is stated to be extremely confused, Mr. Gray reckons four species, two of which he describes as new. Mr. Gray stated that he was unable to identify with any of the four species mentioned by him on this occasion, or to separate from them the *Palædoces,* figured in Marsham's "Systematic Zoology," or the *Pygmy Musk of Sumatra," figured in Mr. Gray's edition of Cuvier's 'Animal Kingdom,' on which Fitch established his Muschus Griffithii. The *Moschus pygmy Muschus of Linnaeus,* in Mr. Gray's opinion, belongs to the genus *Capreolus,* the *Pygmy Musk of Sumatra,* figured in Mr. Gray's edition of Cuvier's 'Animal Kingdom,' on which Fitch has established his Muschus Griffithii. The *Moschus pygmy Muschus of Linnaeus,* in Mr. Gray's opinion, belongs to the genus *Capreolus,* the *Pygmy Musk of Sumatra,* figured in Mr. Gray's edition of Cuvier's 'Animal Kingdom,' on which Fitch has established his Muschus Griffithii. The *Moschus pygmy Muschus of Linnaeus,* in Mr. Gray's opinion, belongs to the genus *Capreolus,* the *Pygmy Musk of Sumatra,* figured in Mr. Gray's edition of Cuvier's 'Animal Kingdom,' on which Fitch has established his Muschus Griffithii. In this division, the synonymy of which is stated to be extremely confused, Mr. Gray reckons four species, two of which he describes as new. Mr. Gray stated that he was unable to identify with any of the four species mentioned by him on this occasion, or to separate from them the *Palædoces,* figured in Marsham's "Systematic Zoology," or the *Pygmy Musk of Sumatra,* figured in Mr. Gray's edition of Cuvier's 'Animal Kingdom,' on which Fitch has established his Muschus Griffithii.

In the same year Mr. Ogilby, in his paper on the *Rinnae,* read before the Zoological Society, makes the *Moschidae* the third family of that order, with the following character.

Feet bisulcate; horns none; incisor teeth (prisms above none, beneath eight. Two genera.

1. *Moschus.* Rhinaria large. Lachrymal sinuses much more prominent than nasal follicles none; testes large. Type Moschus Moschiferus.


Mr. Ogilby goes on to state that the genus *Izalbus,* founded upon the observation of a single specimen, was eventually proved to belong to a different family; and that he observes that it differs little from the true antelope, and is a synonym of the Indian species of Moschina, other forms, Mr. Ogilby remarks, are still wanting to fill up the chasms which evidently exist among the characters of that group. 'Two,' continues Mr. Ogilby, 'forms are more especially indicated, and our knowledge of the laws of organic combination, and of the constituent relationships of other groups, gives us every reason to believe in the actual existence, and to anticipate their discovery.'

Then proceeds to characterise the genus *Himantus* in *Capreolus,* observing that it will probably be found among the forms of the Indian archipelago, and on the elevated table-lands of Mexico and South America.

'It may appear a bold, perhaps a presumptuous undertaking, to state, in the year 1836, the discovery of a new species and define the characters of genera, of which actual existence we have no positive knowledge; but, as already remarked, all the analogies of nature, whether derived from organic combination, or from the constituent members of similar genera, in favour of the belief that the genus *Izalbus,* if indeed it eventually prove to be a genus of which I had long previously defined the characters, as I have herein done for the presumed genera *Himantus* and *Capreolus,* strengthens my belief in the existence of such forms, and increases the probability of their future discovery.' The family is placed by Mr. Ogilby between the *Ceridæ* and *Caprædae.*

The same author makes *Tragulus* (type *Antilope pygmaea*) the first genus of his family *Bovidæ*.
The Moschidae do not differ much from the other Ruminants; the leading differences are given above, and the general osseous structure of the form may be collected from the following cuts.

**Dental Formula:** Incisors, $0 - 6$; canines, $1 - 1$; molars, $6 - 6 = 34$.

**Organisation.**

**Genera. Moschus.**

**Generic Character.**—See above.

**Example.** Moschus moschiferus, the Musk or Tibet Musk.

**Description.**—Somewhat of the form of a roebuck; but higher behind than it is at the shoulder, from the upper part of which to the sole of the foot it measures about two feet three inches; whilst from the top of the haunches to the soles of the hind feet the measurement is about two feet nine inches. Ears long and rather narrow, in the inside pale-yellow and dark-brown outside. Hair on the body suberect, long, each hair marked with short waves from top to bottom, ash-coloured near the base, black or blackish near the end, and rusty at the tips. Chin yellow. The colours vary. Most of the adults are plain-coloured. In some, and such is the individual figured by Pennant, the fore part of the neck is marked on each side with long white stripes from the head to the chest, the back striped transversely with pale brown reaching to the sides, which are also dappled with a lighter colour.† Hoofs very long and deeply divided, spurious hoofs very long. Tail about an inch long, concealed in the hair. Scrotum rudiment. Penis very pericrepidus. (Pennant.)

**Female** less than the male and wants the two tusks.

**Habit, Food, Utility to Man.**—The Musk is a mountain-animal, timid and shy, and a lover of solitude. Precipices covered with pines and almost inaccessible crags are its favourite haunts; and the musk-hunter often perils his life in the dangerous chase, for when hotly pursued, the animal takes refuge frequently in the highest fastnesses, leaving men and dogs with scarcely the possibility of access to the precipitous summits to which it flies. And yet the slaughter made among them must at one time have been great, and the animals abundant; for Tavernier bought in one journey 7673 musk-bags. The bag, or tumor, containing this well known drug is peculiar to the male: it is kidney-shaped, pendulous, of the size of a hen’s egg, and situated beneath the abdomen. There are said to be two apertures, the larger oblong, the smaller round, and covered with hair: and on the application of pressure, the musk may be forced through the apertures. It is brown and unctuous. This bag the hunters cut off, and tie it up for sale, but, like everything that is calculated for the use of man and is the object of commerce, it is said to be adulterated by the admixture of foreign matter, and pieces of lead are stated to

* These figures are taken from specimens in the museum of the College of Surgeons by permission of the Museum Committee.

† But note, this may have been a young animal.
The description given by Linneus of this species is an example of his great neatness. He describes the Tibetan musk as *Moschus folliculo umbilicalis*; and this is the distinction of the species, as far as we yet know. It does not appear to have been known to the ancients, but seems to have been first mentioned by the Arabians. Serapion described it in the eighth century.

Memimus.

**Generic Character.**—See above.

Example, *Moschus Memimus*, Linn. The only species known.

**Description.**—Length about 17 inches. Ashy-olive; throat, breast, and belly white; sides and haunches spotted and barred transversely with white; ears large and open, tail very short. Weight about five pounds and a half.

**Locality.**—Ceylon and Java. (Pennant.) Col. Sykes informs us that it is the *Pavarech* of the Maharratas, and that it is found in considerable numbers in the dense woods of the Western Ghauts, but never on the plains. (*Zool. Proc.* 1831.) Pennant described it from a drawing communicated by Governor Loten, of Ceylon.
of the most populous provinces of the empire. It is divided into thirteen circles.

The face of the country is an undulating plain, here and there broken by groups of low hills and the steep banks of the rivers; it is not indeed quite uniform, but nowhere presents any grand features. The

(During the reign of the Emperor Diocletian, the emperor divided the empire into four parts, each with its own capital. The most populous province, according to the text, is Moesia.)

of the

Localities.—Java and Sumatra.

Habits.—Sir Stamford Raffles states that this species frequents thickets near the sea-shore and feeds principally upon the berries of a species of Ardisia. He adds that it can be easily trained, when taken young, and will become quite familiar.

Occurrences also to this genus Moche Kunchi (Java Mouk of Shau, Le Chevreau de Java of Buffon); fulicen- (Le jeune chevreau de Buffon); and Stanleyanus, of which last, in 1836, there were four living specimens in the magnificant collection of the Earl of Derby at Knowsley; and two others, consisting of a specimen of each of the varieties, in that of the Zoological Society of London, the gift of her present majesty. With the exception of the last, whose locality is not known, these are Oriental, the Kunchi being an inhabitant of Java, and the Tragulus fulicenster a native of the Malacca Islands in the Indian Peninsu- lus, but the habitat of Tragulus fulicenster is given by Mr. Gray with a query.

Fossil Mosphi-de.

The following specimens were collected by M. antiquus, Kaup (Eppelsheim sand). M. bengalensis, (Tertiary, north-east border of Bengal, Pentland); M. pratti (Tertiary, Isle of Wight, Pratt). Dr. Schinz also mentions the teeth of these ruminating animals as occurring in the Tertiary coal of Zürich; he draws a vast quantity, which are larger than the teeth of the small musk; the other belongs to a species of deer. Remains of Moschus are also mentioned by Jaeger (Tertiary, Bean iron-ore (Bolnica) of the Rauh Alp).

MOSCHOPULUS, MANUEL. Several treatises on agriculture are ascribed to this name, are extant; but there is some difficulty in saying who he was and when he lived. The opinion generally received appears to be that there were two of the name: an elder, called Moschopulus of Crete, or the Grammariam; and a younger, who composed an account of the cultivation in Italy. These works were written by Michael VIII., Palaeologus, about 1270. Some writers have spoken of a third Moschopulus, who taught Greek in Italy in the latter part of the fifteenth century; but this fact does not seem well established, and we may perhaps attribute all the works which go under the name of Moschop- ulus to the uncle and nephew above mentioned.

Among these works are, 'Eretomata, or Grammatical Questions,' Basel, 1549; 'A Collection of Atticism,' On Grammar, or the supply of the Greek language, with a great proportion, not only of cattle, but of wool, fowls, &c. While the inhabitants chiefly attend to domestic poultry and calves, for which they are sure of obtaining a good price in the capital. Some attempts have been made of late years to improve the breeds of cattle, but with little success, as the climate does not agree with the Merinos. More attention has been paid to the breed of horses, and there are ten consider- able studs, some of which belong to the crown. Game is not abundant; the sportsman finds only hares and birds. Bears and wolves have not yet been exterminated; some forests. Most of the rivers and lakes abound in fish, but are far from yielding sufficient for the consumption of the people. The minerals are freestone, potters' clay, brick- clay, lime, gysum, alabaster, and bog-iron.

Manufactures of various kinds are carried on to a great extent, both by the country-people for their own supply as well as for sale, and also in the villages and towns, and especially in the capital. The number of manufactories has increased rapidly during the last twenty years. The manufacture of woollen cloths, hats, silks, leather, chintz and calico, linen, cotton, paper, china, carthiware, &c. There are many distilleries and breweries, and numerous small manufactories; in fact almost every family in the country has some trade of manufacture. In 1830 the number of large manufactories had increased to 750.

The province has of course no maritime commerce, but its inland trade is very extensive; Moscow, from its wealth and industry, being necessarily one of the greatest emporia in the interior. Moscow may indeed be called the centre of the internal trade of Russia, as St. Peters burg is of its mar-itime commerce. Other towns of this province, are—1. Kolomna, on the river Kolomenska at its junction with the Moskwa. The town, which is divided by the Kolomenska into two parts, contains 17 churches, and is a considerable town.
stone, and most of them situated in open squares, in consequence of which they escaped the fire of 1812. Hence MOSCOW has lost little or nothing of its original aspect by the fire, especially as the part of the Kremlin which was burned up by order of Napoleon has been rebuilt in the same style. The roofs of the houses are composed of iron plates, painted dark green, so that at a distance they are lost among the tall groups of trees which rise from the gardens. The gilding of the spires is of copper in general, and gold in the background. The best view of the city is from the Ivan Venkii, or great tower of Ivan in the Kremlin, which is at the centre of the city. Before we say any more of the present state of MOSCOW, let us glance at its history, and see in which so large a portion of it was destroyed during the invasion in 1812. After all that has been said and written on the authors of this dreadful conflagration, it seems to be generally allowed that it was contrived by the Russian themselves. Count Rostopchin, the governor of MOSCOW who was generally looked upon as the author of it, never acknowledged it, and even published, in 1823, a pamphlet which he called 'La Vérité sur l’Incendie de Moscou,' in which he positively denies that he had any share in it. But it must be remembered that the destruction of the city by the Russian cause in two ways: by depriving the French of the immense resources which they would have found there, and by inflicting the passions of the people against the invaders, as represented by the destroyers of the holy city. Several Russian writers have acknowledged that the Russians were the authors of the fire. The French are unanimous in ascribing it to them; and in fact no motive can be assigned for the destruction of the city by the French, except that they had a quarrel. It is probable that the Russians themselves never considered the burning of MOSCOW in the same light as the destruction of Western Europe. Devastating fires have been common occurrences in the history of MOSCOW, from its foundation. The beginning of the city is precisely the beginning of the city; and the accounts of such visitations in the earlier periods are done less lost, we have accounts of no fewer than seven devastation, which totally destroyed the city, and most of the were the work of foreign invaders. Accordingly, we may fairly conclude that it was for the burning of the capital not as a crisis giving a turn to the course of the war, but as a concomitant event of secondary importance. Perhaps they consorted themselves with the reflection that it had always arisen from its sobs with increased splendour and beauty, as it has in fact done in the present instance. With respect to the extent of the destruction, it appears that MOSCOW contained nearly 18,000 of what are called numbers or courts, each consisting of a principal house and two or more dependent buildings. Of these, about 7,000 courts were burned down, and 53 stone houses only 525 escaped, and of 6,000 wooden houses, only 1797 were left. ‘Innumerable palaces,’ says Dr. Lytton, ‘crowds of noble mansions, and thousands of houses, bath, shops, and blocks of houses, containing the rich and luxurian patterns, the cabinets and palaces, were destroyed. The total loss in the fire and the war in the city and government of MOSCOW was estimated at 321 millions of rubles. The government appointed a commission of indemnity, but several thousand individuals did not present any statement of their houses. Then the loss sustained by the two counts Razumovsky, by Count Apraxin, by Count Boulourin, whose library, valued at a million, was wholly consumed, and by Countess Raschek, amounted to about 11 houses of the first magnitude and 12,000 rubles. But immense and irreparable as the mass of individual suffering undoubtedly was, the memory of it gradually fades away as the Russians see their venerable city rise with increased beauty from its ruins. We cannot here enter into the question of the progress of the city since the year 1813, which has so greatly changed the appearance of MOSCOW. The extraordinary mixture of contrast of magnificent palaces and petty huts, so often to be seen nowadays, though still occurring in a few places, no longer strikes the eye as formerly. MOSCOW has lost its Asiatic features, and assuming the appearance of the capitals of Western Europe. Happily for the lovers of venerable antiquity, the Kremlin, which suffered comparatively little, and which yet contains the remains of the French to keep it up, retains unimpaired its ancient grandeur. (Lytton.) According to the latest detailed account that we have co-
tained, Moscow contained in 1835 above 10,000 houses, of which more than 2000 were of stone, seven cathedrals, 21 monasteries, 245 Greek, 2 Roman Catholic, and 3 Protestant, besides 2 English churches, 3 Armenian chapels, and a Turkish mosque. The emperor Alexander had intended to build on the Sparrow Hill a church to our Saviour, and he actually laid the first stone in 1817. This prodigious edifice was to consist of three distinct churches one above the other, and the total height to be 770 feet, but the design has been altered. The emperor, who ordered a large interior to be built instead.

I. The Kremlin.—The Kremlin, which was first built of stone in 1367, in a commanding situation on the banks of the Moskva, the Moskva being 24 feet wide, from 12 to 16 feet thick, and of different heights, 28, 30, 35, 45, and 50 feet, with battlements, embrasures, numerous towers, and five gates. The palace contains what remains of the ancient palace of the Czars, the new palace, founded in 1743, burned in 1812, rebuilt in 1816, and since that time successively altered and enlarged. It is not remarkable for its architecture or magnificence. The cathedral of the Assumption of the Virgin, founded in 1329, is one of the oldest in the country. This cathedral means a large edifice compared with the cathedrals of other countries, but the interior is adorned with extraordinary profusion and splendour. Besides numerous paintings, representing events in the life of our Saviour, there are on the walls and numerous frescoes of scenes from the life of angels, apostles, saints, martyrs, male and female sovereigns, and patriarchs. Many highly venerated relics are preserved in this cathedral. The Russian sovereigns are here crowned and anointed. The cathedral of St. Michael the Archangel, built in 1382, contains in its interior a cross from the time that Moscow became the capital till the death of Peter the Great, and, besides those of many male members of the imperial family the 'emblems' of the Czars, in various shapes and sizes, the cathedral of the Annunciation is smaller than the preceding, but built in better taste, and being splendidly ornamented, is a pleasing and magnificent object, forming, as it were, a wing to the palace. The cathedral of the Transfiguration, in the Kremlin, is a fine edifice, founded in 1328, and rebuilt in 1597. Including the cathedrals, there are 32 churches in the Kremlin.

After the cathedrals, the Ivanovskaya belfry claims attention for its size, its elegance, and magnificent appearance. When the French in 1812 were in Moscow in 1812, they were not allowed to enter the whole of this belfry, which was laid in ruins, except the tower called Ivan Veliki, which was rent from top to bottom and otherwise injured. Napoleon caused the cross, which was highly venerated by the Russians, to be cut down, and placed it in a church in Paris, but it was left behind in the retreat. The belfry has been entirely rebuilt nearly in the same style as before, but it is now more beautiful and splendid. This tower is 269 feet 6 inches high from the bottom to the top, and is surrounded by 72 arches, on which bells, there is in this belfry the celebrated bell said to be the largest in the world. It was cast in 1736, but fell in consequence of a fire in 1737, and is now sunk by its weight to some depth in the ground. It has been said to weigh 480,000 lbs., but an inscription states the weight at 10,000 pounds, or 360,000 lbs. English. The Kremlin contains likewise the imperial museum, the arsenal, the palace of the patriarch, the Chashof monastery, and the Vnensezhskoe monastery. Regularly the palace may be exercised at any time. It is decorated by Lieutenant-General Betoncourt, and the execution of the plan superintended by General Charbonnier. The roof rests entirely on the walls. The foundling-hospital, founded in 1763, is an immense quadrangle, four stories high, besides the basement. It is furnished with the elevated bank of the Moskva, and on the west side of the Yauza. It is a very plain and inestimable edifice. It is said that it has been productive of great benefit in Moscow in preventing the crime of infanticide, which was very prevalent in Moscow, when the manner of the barbarous practice of exposing children is now unknown. It is to be regretted that no lists of the mortality are published. Storch could procure none. Dr. Lyall could very plain and inestimable edifice. It is said that it has been productive of great benefit in Moscow in preventing the crime of infanticide, which was very prevalent in Moscow, when the manner of the barbarous practice of exposing children is now unknown. It is to be regretted that no lists of the mortality are published. Storch could procure none. Dr. Lyall could
MOS

in the preceding year 4340 had been received, being an average of very nearly 12 in a day. The assembly-house of the nobility is a large pile of building, or rather a number of buildings, the whole of which is like a village house. The interior is fitted up with great splendour: the grand ball is large enough to contain 2000 persons. It was burnt in 1812, and has since been rebuilt: the emperor contributed 100,000 rubles. The palace of General Apxin far exceeds in splendour the private edifices of the wealthiest persons, consisting almost totally consumed in 1812, but was rebuilt with remarkable rapidity. The palace of Potchefstroom is reckoned one of the finest specimens of architecture in Moscow. The college of mines, the college of foreign affairs, containing almost all the treasures, the college of printing, the house of the book seller, carefully arranged, among which are several English state papers, splendidly ornamented, from 1575 (Philip and Mary) to 1663 (Charles II.), the post-office, and the house of the Bible Society remain. They are built for their use than for their style of architecture. Several of the churches and monasteries are worth of notice.

IV. The Zemliano-Gorod, or earthen town, was so called from the earthen rampart, which was erected in 1618; but of which nothing remains. This rampart, forming a pretty regular circle, enclosed the four divisions of the city. In this place there are promenades planted with trees. In this division are the dépôt of the commissariat, a handsome building, containing in its central stairway two stories that are adorned with Doric columns, with a balcony at their base. The dépôt for spirits, which occupies an immense space forming two squares, is chiefly remarkable for its length and its use, being the dépôt for the spirits, or vehicle of the speys, as the rich trade in salt belongs to Moscow. From this all Moscow and the neighbourhood are supplied. The Imperial Philanthropic Society, the Moscow Commercial School (an excellent institution), are plain edifices; the Medico-Chirurgical Academy is a large building three stories high, with a noble portico in front; it has two detached advanced wings. It possesses a very respectable anatomical museum, and a fine collection of specimens from the three kingdoms of nature. The Zlatoust monastery is a great ornament to this part of the city. This monastery derives its name from the church dedicated to the Zlatchytch, or conception of St. Ann, a handsome building in the Gothic style, the interior of which is very elegant and splendid.

V. The alkobor, or suburbs, in 1783, not a trace now remains. This rampart, forming a pretty regular circle, enclosed the four divisions of the city. In this place there are promenades planted with trees. In this division are the dépôt of the commissariat, a handsome building, containing in its central stairway two stories that are adorned with Doric columns, with a balcony at their base. The dépôt for spirits, which occupies an immense space forming two squares, is chiefly remarkable for its length and its use, being the dépôt for the spirits, or vehicle of the speys, as the rich trade in salt belongs to Moscow. From this all Moscow and the neighbourhood are supplied. The Imperial Philanthropic Society, the Moscow Commercial School (an excellent institution), are plain edifices; the Medico-Chirurgical Academy is a large building three stories high, with a noble portico in front; it has two detached advanced wings. It possesses a very respectable anatomical museum, and a fine collection of specimens from the three kingdoms of nature. The Zlatoust monastery is a great ornament to this part of the city. This monastery derives its name from the church dedicated to the Zlatchytch, or conception of St. Ann, a handsome building in the Gothic style, the interior of which is very elegant and splendid.

MOSSELLE, an important river belonging to the system of the Rhine, which has the upper part of its course in the Rhineland and the lower part in the Rhenish provinces of Prussia. It rises on the western slopes of the Vosges, near the southern extremity of that range, at an elevation of 372 French toises, about 180 English feet, above the level of the sea. At its first course in the basin of the Rhine, the Moselle branches into the rambinations of the Vosges; but at Charmes, below Epinal, it enters the great plain of Lorraine, which is wholly watered by this river and its tributaries, of which the principal are the Meurthe and the Meurthe, both on the right bank. The course of the Moselle is at first north-north-west for 5 miles to Toul: from Toul it flows north-east in a winding channel of 17 miles to the junction of the Meurthe, where the navigation commences. From the junction of the Moselle with the Meurthe, the river flows north-west, passing through Lorraine, and divides the territory of the French and the Prussians. The Moselle, after passing Lorraine, enters the territory of the Meurthe, and after skirtting Luxembourg, enters the Prussian territory. After leaving France it flows 165 miles in a winding channel north-east past Trèves, Bernolsch, and Trarbach, to its junction with the Rhine at Coblenz, and its greatest breadth, at right angles to the length of the Saar, which is partly a French river. The whole course of the Moselle is about 266 miles, for 170 of which it is navigable.

The Moselle is subject to frequent inundations, which cause considerable damage. It is used for floating timber for 65 miles above the junction of the Meurthe. The navigation, especially in the French part of the river, is subject to considerable difficulties; in some parts, the rocks and the shallows render navigation difficult. In others, from the shallows produced by too great an expansion of the river, it is obstructed; these impediments, however, it serves as the outlet for the produce of a considerable district, especially for timber and lead, charcoal, pit-coal, freestone, slate, corn, wine, and manufactures, dispersed in a hundred towns.

MOSELLE, a department of France, on the north-eastern frontier; bounded on the north and north-east by the grand-duchy of Luxembourg and the Rhenish provinces of Prussia, on the south-east by the department of Besançon, on the south by that of Meurthe, and on the west by that of Meuse. Its form is that of an irregular oblong, having its greatest length from west by north to east by south, from near Longueno, on the Chiers, to the neighbour- hood of Bitche, amid the slopes of the Vosges, 165 miles.

It is divided into six arrondissements, the departmental capital being Nancy, at the bank of the Seille, below Nomeny (Meurthe), to the neighbourhood of Stier, on the Moselle, 41 miles.
between 48° 53' and 49° 33' N. lat., and between 5° 29' and 6° 4' E. longitude.

The department is administered by a prefect, and is divided into 10 arrondissements. The departmental capital is Longwy. The population, in 1831, was 147,725; in 1851, 162,270, showing an increase in five years of 14,527, or about 9.5 per cent., and giving 207 inhabitants to a square mile. The amount and density of population the department is considerably above the average of France, and in both respects rather above the English department of Staffordshire. In 1851, the number of the capital, is in 49° 6' N. lat. and 6° 12' E. long., 172 miles in a direct line east by north of Paris, or 191 miles by the road through Châlons-sur-Marne and Verdun.

The highlands of the department are at the extremities. The eastern extremity is traversed by the chain of the Vosges, and the western by the heights of Ardenne, which are not so elevated as the Vosges. The intermediate part belongs to the broad valley, or rather plain, of Lorraine, which is watered by the Moselle and its tributaries. The Vosges consist in this department of a portion of the primitive range, but of the formations which overlie them, to the new red or saliferous sandstone inclusive. The rest of the department is occupied by the formations superior to these, and which intervene between the red-sandstone and the chalk. This formation is excellently adapted for agricultural purposes in part, but not always in sufficient quantity to make them worth working; copper and lead, the mines of which have been abandoned; coal; rock salt, in which some mines are wrought; manganese; abundance of gypsum; excellent freestone, and a great variety of the clays of the potters' earth, and crucible clay. The principal mines of iron-ore are in the arrondissements of Briey and Thionville.

There are in the department eighteen establishments for working iron: in these establishments are fifteen furnaces for making pig-iron, in eleven of which charcoal alone is used; in four, charcoal mixed with coke or other fuel; sixty-nine forges for making wrought-iron; and three for the manufacture of steel. There is one coal-pit in the department, and one each of lignite and peat. The population is 160 or 170 persons, three-fourths of them in the mine, and produced annually nearly 900 tons of ordinary coal: in 1835 the produce rose to more than 3000 tons.

The department is included almost entirely in the basin of the Moselle: a few of the streams which rise on the eastern slopes of the Vosges, and flow immediately into the Rhine, have their sources just within the eastern boundary of the department; and the Chiers, and its tributary the Crune, which belong to the system of the Meurthe, are the only streams which rise within the department on the south, near Pont-à-Mousson, and flows northward, 41 miles through the department, by Metz, Thionville, and Sierck. It is navigable in all this part. The Sarre, the river or stream called the Sarre, runs from south to north, 22 miles. The Canal des Salines, which was formed to convey the produce of the salt-works of Meurthe to the Sarre, has part of its course in this department. It follows the valley, first westward, and then with a northerly course, and then east itself till its junction with the Sarre. There are a considerable number of pools or small lakes, and some meadows.

The number of Routes Royales, or government roads, is thirty-one; their aggregate length (Jan. 1, 1837) was 276 miles, viz.: 251 miles in repair, 26 miles out of repair, and 19 miles unfinished. The principal road is that from Paris to Metz, and from thence onward into the Prussian and other German states. It enters the department on the south-west side, and runs first east, and then east-north-east, by Metz, Sarreguemines, Hombourg, and Forbach. The road from Paris to Luxembourg crosses the valley of the department through Longuich and Longwy. Roads run from Metz to Longwy, with a branch to Thionville; to Sarre-louis in the Prussian states; to Nancy and to Château Salins, in the department of Meurthe. There are roads from Sarreguemines by Château Salins to Nancy, by Sarrebourg to Rhin to Phalsbourg (Meurthe), and Strasbourg (BassRhin); and to Sarrebruck, in the Prussian territory. The Routes Départementales, or departmental roads, had (Jan. 1, 1837) a aggregate length of 216 miles, viz.: 182 in repair and 34 out of repair. The aggregate length of the routes and paths (chemins vicinaux) was above 3000 miles. In the means of communication, both by land and water, this department is better provided than the French departments generally are.

The temperature of the department varies with the elevation of the surface: in the plain of the Moselle it is mild; in the hilly and mountainous tracts the cold is of longer duration and more severe. In the neighbourhood of Sarreguemines and of Bitche, amid the Vosges, the snow lies long on the ground, and the transition from winter to summer is very rapid. Agriculture is better understood and practised in this department than in most parts of France, and the peasant is distinguished by their activity and industry. Paddock, vineyards and orchards are dispersed into disuse; and the employment of marl, and especially gyspum, as manure, is common. About 750,000 acres, nearly three-fifths of the whole surface, are under the plough. The quantity of wheat raised exceeds by a third the average produce of the French territory. The staple crops are: barley, oats, rape, and manil (or mixed corn), the preponderance is about the same; but from the number of horses, the supply of oats is not sufficient to meet the demand. Cereals are considerable; hay is abundant, and the fields of flax and hemp, and of linseed, rape, and colza, from which abundance of oil is produced. Potatoes are cultivated, but not so extensively as in other parts; maize is little grown, and buckwheat not at all. About 35,000 acres are occupied as vineyards, the wines are sold either in the department or are sent into Germany; the commoner sorts are consumed at home. The quantity of woodland is considerable, about 230,000 acres, and affords a supply of fuel for domestic use, and for the iron and other works: the trees are chiefly, oak, beech and hazel: a considerable trade is carried on in walkingsticks, made from the thorn and the cornel.

The meadow-land amounts to 110,000 or 120,000 acres: a small portion of it is devoted to the cultivation of the potato, but of hardwood grasses, such as clover, the quantity is as great as in the average of the departments, but they are of a very ordinary breed. The number of horned cattle is rather above the average; but they are of small size, and do not readily fatten. The number of sheep is comparatively very small, and numbers decrease from year to year. Considerable efforts have however been made of late years for its improvement: the Merinos have been introduced on the model farm of Money, in the arrondissement of Briey; and the English and English cross breeds are kept in the other establishments. Swine are numerous; their flesh affords a substitute for the deficient supply of beef. Bees are pretty extensively kept.

The forests abound with game: the wild boar is only found; but there are abundant hares, as well as the wolf, the fox, and wild cats, are common. Redbrests abound in the neighbourhood of Metz, where they are taken in autumn in great numbers, being esteemed a delicacy. The rivers abound with fish; the Sarre and the Moselle yield...
Longouin or Longwyon (pop. 1612), on or near the Chiers. Brey consists of several narrow streets on the slope of a steep hill, and is commanded by two branches of a well wooded and watered. Longwy consists of two parts, the upper and lower town. The upper town is on a rock, and was fortified by Vauvan. In the lower town there was an ancient fortress, on the site of which Roman remains have been dug up. It has been supposed that the town occupies the site of a Roman camp. The principal square is large and regularly formed; the principal public buildings are the town-hall and the hospital. The inhabitants have an oil-press and a brewery; they manufacture earthenware ware of all kinds, and in trade are noted. Longwy, Longwyon was besieged by the Prussians in 1815, and though garrisoned only by 200 soldiers, was not taken without the loss of 3000 men. There is a school of mutual instruction.

In the arrondissement of Sarreguemines are—Sarreguemines (pop. in 1831, 3142 town, 4183 whole commune; in 1836, 4113 for the commune) and Sarralbe (pop. 2392 town, 3544 whole commune), on the Sarre; Morhange, near the fortress; Semarey, which town forms a part of the fortress, or Poutanges (pop. 1797 town, 2290 whole commune), on a feeder of the Aube; St. Avold (pop. 3298 town, 3451 whole commune) and Hombourg, on the Rossel; Forbach (pop. 2938 town, 4281 whole commune), between the Rossel and Meurthe; the Sarreguimer castle, near the city of Sarreguemines (whole commune), amid the slopes of the Vosges. Sarregumines is a well built town; its principal street leads to the bridge over the Sarre. There are considerable post offices here, in which earthenware of every quality are manufactured, and sent to other countries. The inhabitants, Parian, and all the glassworks of the Etruscan vases, and an artificial porphyry of great beauty, are made here. Snuff-boxes of paper-mâché are made round this town to the yearly value of more than 30,000 francs. There are several corn-mills and breweries here, a back-mill and a tile-kiln. There is a high school at Sarreguemines. Sarralbe derives its name from its situation at the confluence of the Sarre and the Aube. The inhabitants manufacture linen; the weavers work not in factories, but, as in Ireland, in their own houses. Near the town stands a mill which annually 900 to 1000 tons of salt. Near St. Avold are several flour-mills and a tile-kiln. Bitche is built at the foot of a rock of red-sandstone, on which is situated a fortress. It was an impregnable post of the fortress up to the face of the rock is very steep, and the whole interior of the rock is vaulted and formed into casemates. There is a well dug in the rock 370 feet deep and protected by a bomb-proof covering. There are in the town an hospital, a small barrack, and two churches. St. Goetz, near which town is taken by the Prince of Condé, after the great battle of Rocroy, a.d. 1649. It was a fortress of some strength, on the left bank of the river, and was mainly besieged by the Prussians in a.d. 1792. It has an old wooden bridge remarkable for the facility with which it can be employed, and in the town are several potteries and breweries, two corn-mills, two bark-mills, and an oil-press. There is a school of mutual instruction; courses of instruction are given in geometry and mechanics applied to the arts.

Sierck is situated at the foot of a rocky eminence, crowned by a fortress. This place has several tan-yards; glue is made, and stones for oil-mills and presses are cut from one piece. The stone with which Metz is peppered is taken from this town. Sierck is the mart for the hardwares and laces of the duchy of Berg, the silks of Crevelt, the needles of Aix-la-Chapelle, and the copper wares of Stolberg. There is a custom-house (the town being close on the frontier), the revenue collected at which is above 2000 per annum.

At Bouzouzine are corn-mills and oil-presses, several tan-yards, glue manufactories, and cabinet-makers' shops; a brewery, and two lime-kilns. There are a school for mutual instruction and an outline drawing-school. At Cattenom, a village between Thionville and Sierck, is held the Biè; the usual cattle-fair of this district, and at Hayange, Moyeuvre Grande, and other villages in the neighbourhood of Thionville, are the vast iron-works established by the late M. Wendel, for the preparation of iron by the English methods.

In the arrondissement of Brey are—Brey (pop. 1831, 1755 commune; in 1831, 1730), on the Woogot, or Voogot, a small feeder of the Ornez and Longwy; (pop. 2485), and
Inferior to the adjacent departments of Meuse, Meurthe, and Bas-Rhin. Of every 100 young men enrolled in the military census for 1828-29, 57 could read and write. The number in the departments was, in Meuse 74, Meurthe 66, Bas-Rhin 62; average of France 39.

This department antecedently constituted part of the territory of the Mediomatrici, whose capital was Divodurum, afterwards Mediomatrici or Mettis, now Metz, and of the territory of the Sequani and the 'Sequani of Toltrix. These people, in the Roman division of Gaul, comprised the province of Belgica Prima. The Romans called the Moselle, Mosella (i.e. the little Meuse, a diminutive of Mosse, the Meuse), and the Sarre, Saravus. In the territory of Sequani, beside Divodurum, were the town of Bilodurum, which D'Anville fixes on the river Yron, on the border of this department and that of Meuse; Carnueca, somewhere near Thionville; and Ad Duoducimur, on the border of this department and that of Meurthe. There do not appear to have been any other Roman or Gallic towns mentioned by ancient authors within the boundary. From the Romans the department passed to the Franks; in the middle ages it was known as part of the county of Luxembourg, and it was part of the Revolutions included in the province of Lorraine.

MOSES (thyúí, Mωσῆ, מֹשֶה), the lawgiver of the Hebrew people, was an Israelite of the tribe of Levi, and the son of Amram and Jochebed (Exod., ii. 1; vi. 26). He was born in Egypt, in the year 1571 B.C., according to the common chronology. To evade the edict of Pharaoh, the king of Egypt, that all the male children of the Hebrews should be killed (Exod., i. 22), he was hid by his parents in the reeds by the bank of the Nile. Here the child was found by Pharaoh's daughter, who adopted him for her son, entrusting him to his own mother to nurse, by which circumstance he was preserved. The Egyptians, unaware of his own origin, called him a Hebrew. He was probably educated at the Egyptian court, where he became 'learned in all the wisdom of the Egyptians.' (Exod., ii. 1-10; Acts, vii. 29-32; Heb., xi. 23.) At the age of forty years Moses conceived the idea of freeing his Hebrew brethren from their bondage in the land of Egypt; on one occasion, seeing an Egyptian (probably some officer) maltreating an Israelite, he interfered, slew the Egyptian, and buried him in the sand. The next day, upon his attempting to reconcile two Hebrews who had quarrelled, his services were scornfully rejected, and he was upbraided with the murder of the Egyptian. Finding that his secret was known, he fled from Egypt, and took refuge with a tribe of Midianites in Arab Petra in Arabia (Midianites), among whom he lived as a shepherd forty years, having married Zipporah, daughter or Reuel. (Exod., ii. 11-22; Acts, vii. 23-30; Heb., xi. 24-27.)

As Moses fed his father-in-law's flocks in the desert of Sinai, God appeared to him at Mount Horeb in a bush which burnt with fire, but was not consumed. Because of the latter circumstances of the Israelites—and commanded him to return to Egypt and lead out his people thence into the land of Canaan. His elder brother Aaron was joined with Moses in this mission, and the power of working certain miracles was conferred upon him. On his arrival in Egypt, the Israelites accepted him as their deliverer, and after bringing ten miraculous plagues upon the land of Egypt before he could gain Pharaoh's consent to the departure of the people, he led them out through the Red Sea, which was miraculously divided, into the land of Canaan. (Exod., iii., xvi.) [EXODUS: JEWS] While the people were encamped at the foot of Sinai, God delivered to them, through Moses, the law which, with some additions and alterations, was ever after observed as the national standard of the Israelites through the wilderness for forty years [Jews]. Moses appointed Joshua as his successor in the command over them, and died at the age of 120 years, on Mount Pisgah, on the east side of the river Jordan, having first been bidden to view the land of Canaan from its summit. God buried him in the valley of Bethpeor in the land of Moab, but his tomb was never made known. (Deut., xxxiv.; Judg., v. 9.)

The following points in the history of Moses require further explanation.

1. The name of Moses (Μωσῆς) was given him by the Egyptian princess, 'because,' she said, 'I drew him out to (from ἰθήκη to draw out) of the water.' (Exod., ii. 10.) Now, under the circumstances of the case, the name is much more likely to be Egyptian than Hebrew, and its real derivation is probably that given by Jablonsky (Opusc. i. 132-7), from the Coptic Mo', 'water,' and Dudsche, 'saved.' This is confirmed by the Septuagint, which, it is always used in the Septuagint, and by the testimony of Josephus (Antiq. ii. 9, 6) and Philo (De Vita Mosis, ii. 83).

2. The gap left by the Scripture narrative in the early history of Moses has been filled up by Josephus, Philo, and other writers with various legends, some of them highly improbable, of which an outline is given in Milman's History of the Jews, vol. i., p. 61, &c.

3. The miracles of Moses have been made the subject of much discussion, and many divines of the Rationalist school have attempted to explain them as an advantage cleverly taken of natural phenomena, or as ingenious jugglery. Even if it were admitted that most of the ten plagues were visitations to which Egypt was subject, they would still retain all the essential characters of miracles in increased extent and the unusual time of their occurrence, in the exemption of the Israelites in Goshen from most of them, and in their immediate cessation at the prayer of Moses. The imitation of the first three plagues by the Egyptian magicians has generally been ascribed by Jewish and some modern writers to their special reverence for the Egyptian gods; but assuredly their inability to imitate the fourth and fifth of the plagues, which are altogether foreign to Egyptian cultus (Exod., viii. 18, 19), is a much stronger argument for the miraculous character of these visitations, than their imitation of the earlier ones is against it. Several writers have shown how greatly the sufferings of the Egyptians from these plagues were aggravated by their physical circumstances and religious opinions. (Bryant's Observations upon the Plagues inflicted on the Egyptians; Rosenmuller's Scholia, Exod. viii. 1, &c.; Milman's History of the Jews, vol. i. p. 66, &c.) Other difficulties connected with Moses' part of the narrative are treated of by Winer and in Winer's Biblischer Realwörterbuch, vol. ii. p. 133-139. Respecting the king of Egypt in whose reign Moses led out the Israelites, and the destruction of the Egyptians in the Red Sea, see Wilkinson's Manners and Customs of the Ancient Egyptians, vol. i., c. 2, p. 54.

The part which Moses took as leader of the Israelites is stated in the Scripture record to have been owing to the direct command of God (Exod., iii.), and the laws which he gave are deemed to have emanated from himself. (Exod., xx. 1, 22, &c.) As the truth of these facts, or, as theologians express it, of the 'Divine Legislation of Moses,' depends chiefly on the authority of the books ascribed to Moses, this part of the subject is referred to PAXTROCKACH.

The Legislation of Moses.—The chief authority for the following account of the Mosaic legislation is the 'Mosaics Recht' of Michaelis. The references are to the English translation of that work by Dr. Alexander Smith. Other works on the subject are mentioned at the end of the article.

The Law is laid down in the books of Exodus, Leviticus, and Numbers, and repeated with modifications in the book of Deuteronomy, but in neither case in any systematic order. (Exod., xx.-xxii., xxx., xxxiv., xxxv., Levit., i.-viii., xi.-xxxvii., Num., v.-x., xvii., xix., xxvi., xxx.; Deut., iv., &c.) The Mosaic laws must be viewed throughout as enacted for a people who were under the supervision of one of the sons of Jehovah out of the nations to preserve the knowledge and worship of the true God, and to exhibit in history their providential dealings of God with his people.

The whole law rested on two fundamental principles, one of which was religious, and the other partly religious and partly political.

The first fundamental principle of the Mosaic law is the worship of Jehovah as the one true God; and consequently an uncompromising opposition to polytheism and idolatry, which were at that time the prevailing religious errors. Other nations, while acknowledging the supreme God as the creator, associated with him subordinate deities, to whose agency they looked for temporal blessings. All such
worship was prohibited by the first words of the law, 'I am Jehovah, thy God, which brought thee out of the land of Egypt, out of the house of bondage. Thou shalt have no other gods with me. (Exod. xx. 2, 5; Deut. iv. 35, 39.) Therefore, the fundamental principle was to worshippers, because they bore the name of Jehovah, the name by which all rule of Egypt, out of the house of bondage. Thou shalt have no other gods with me. (Exod. xx. 2, 5; Deut. iv. 35, 39.) Therefore, the fundamental principle was to worshippers, because they bore the name of Jehovah, the name by which all Israel called themselves, and thus idolatry became the first commandment. (Exod. xix. 4, 6.) To render this fundamental law the more binding, Jehovah, who was already the founder of the nation of Israel by delivering them from Egypt, was also to be their king, and thus the principle of the people themselves, and thus idolatry became a great treason. (Exod. xix. 4, 8; Deut. vi. 22-24, xxxii. 17; xix. 18, 19; xii. 1; 1 Chron. xxix. 21; Isaiah, xxxii. 22.)

The land of Palestine too was represented as the property of God, held under him by the people, who consequently had not the power to alienate it for ever. (Levit. xxv. 23.) This fundamental principle was carried out in the form of government which is commonly called a theocracy, that is, a government under the direct supervision of God. The laws were given by God, and could only be repealed by his command (Deut. iv. 2; xxxii. 32); the judges were selected usually from the ceste of the priests, and are represented as holy persons, sitting in the place of God, to whose decision they submitted difficult cases by means of the Urim and Thummim. (Deut. i. 17; xix. 17.) God often made known his will concerning state affairs through the prophets, of whom a constant succession was promised (Deut. xviii. 21), and should be punished with the loss of property if they kept the law, and threatened to punish them with calamity if they broke it. In these particulars the Israelites were distinguished from other nations as being under the more direct government of God; but nevertheless they had a well-defined civil constitution, as we shall presently see.

The second fundamental principle of the Mosaic law is the discouragement of intercourse between the Israelites and other nations. This principle was not carried so far as to prohibit the settlement of foreigners at Palestine in foreign countries; but both practices were discouraged, and the latter much more than the former. Each man had his hereditary possession in land, which, as he could not sell it, he of course forfeited upon settling in a foreign country. The possession of land was in both cases a material for the people were such as could hardly be observed in strange land. To prevent their indulging in conquest, and thus running the risk of becoming subject to foreign powers, Moses confined them within certain boundaries, and also prohibited their choosing a foreigner as king. (Deut. xviii.)

This state of isolation was well suited to a nation who were sufficiently numerous to people the country assigned to them without the aid of foreigners, and who had neighbours such as the Canaanites, who were not to compete with their commerce for them. But above all this arrangement was necessary for the preservation of the worship of Jehovah among them, prone as their history proves them to have been to follow the idolatry of the surrounding nations. The great communications of any state affects the whole complexion of its institutions. Among the Israelites, trades do not appear to have been followed to any extent as the means of gaining a livelihood. Mechanical labour was probably left to the slaves, who, in the houses of the wealthier, appear to have carried on the extensive manufactories (1 Chron. iv. 21), and to the women (Procr. xxxi.); though in the building of the tabernacle we find some of the more noble mechanical arts practised by women. The Israelites followed their professions dependent on trade or manufactures, and no separate classes of citizens, orburghers, and peasants. The cities of Palestine were only fortified villages, and most of them appear to have been small. Moreover it was the occupation of the Hebrew people. The necessary internal commerce was provided for by the three great feasts, to celebrate which all the men were assembled at Jerusalem thrice a year, and which, in this respect, answered the purpose of modern fairs. But foreign commerce formed the commerce of the nation at all encouraged by the Mosaic institutions, many of which tended directly to obstruct it, especially the making each man a landholder and cultivator, and the law against lending money on interest. Besides, the Egyptians to which Moses came was a powerful and civilised nation flourishing almost without foreign commerce, he was probably influenced by the following reasons in discouraging it. It would tend to introduce idolatry, to tempt many citizens to leave the country, to foster luxury, and to involve the Israelites in quarrels with other nations; while on the other hand they had all the advantages of commerce with the Egyptian nation. As for individual trading caravans in later times Solomon pursued commerce to a great extent, though his seamen were not Israelites, but Egyptians.

The privilege of freebooting to obtain a livelihood was common among the Arabs, and by no means unknown among their Hebrew brethren (Judges, ix. xix.), was discouraged by Moses, both by the allotment of land to every citizen, and by the little encouragement which he gave to hiring.

The real foundation of the Mosaic polity was in agriculture. The whole territory of the state was so divided that every Israelite (that is, every head of a family except those of the tribe of Levi) received a portion of land, whom became the inalienable property of these orders and their descendants. They had previously been a nomadic people, and a trace of that condition was long after preserved in the extent to which they pursued the breeding of cattle.

This freehold basis, as we may call it, prevented the formation of classes of burghers and nobility. There was no distinction of caste, except in the case of the Levites and the descendants of Levi, who were devoted to the offices of religion and learning; but even they could not be sold. The Levites were a part of a general body of public officers, with a property, with certain immunities, but they were supported by the tithes of all the land.

In consequence of the equality of the citizens, the constitution of the republic had a democratic character. When Moses made known any laws, he called together the whole congregation of Israel. Whether an adult male was then about 600,000, it becomes probable that those whose Moses addressed on such occasions were certain persons deputed to represent the rest. Such persons are mentioned in Exod. xix. 7, 8, and Numbr. i. 1; among those was an equal number of representatives from every tribe, and the heads of families, and the tribe of Levi, who composed the high-priest, and the magistrate, and the priest, and the priest, and the Roman senator, the Greek , and the Arab sheikh. It is equally uncertain in what way the heads of families and the chief priests of these tribes were chosen. In the division of the Levites into two tribes which were named after his sons Ephraim and Manasseh (Numbr. i.) a certain number of persons appears to have been necessary to constitute tribes and families. (1 Chron. xxiii. 11.)

These two tribes formed twelve distinct commonwealths, governed by the princes of tribes, and under them by the heads of families; and some of them were divided into separate states, carrying on war independently of each other, even as late as the time of the kings. (Josh. xvi. 2.)

Upon investigation we find some of the more noble mechanical arts practised by women. The Israelites followed their professions dependent on trade or manufactures, and no separate classes of citizens, or burghers, and peasants. The cities of Palestine were only fortified villages, and most of them appear to have been small. Moreover it was the occupation of the Hebrew people. The necessary internal commerce was provided for by the three great feasts, to celebrate which all the men were assembled at Jerusalem thrice a year, and which, in this respect, answered the purpose of modern fairs. But foreign commerce formed the commerce of the nation at all encouraged by the Mosaic institutions, many of which tended directly to obstruct it, especially the making each man a landholder and cultivator, and the law against lending money on interest. Besides, the Egyptians to which Moses came was a powerful and civilised nation flourishing almost without foreign commerce, he was probably influenced by the following reasons in discouraging it. It would tend to introduce idolatry, to tempt many citizens to leave the country, to foster luxury, and to involve the Israelites in quarrels with other nations; while on the other hand they had all the advantages of commerce with the Egyptian nation. As for individual trading caravans in later times Solomon pursued commerce to a great extent, though his seamen were not Israelites, but Egyptians.

The privilege of freebooting to obtain a livelihood was common among the Arabs, and by no means unknown among their Hebrew brethren (Judges, ix. xix.), was discouraged by Moses, both by the allotment of land to every citizen, and by the little encouragement which he gave to hiring.

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Judges iv. 10; xviii. xxiii.; 1 Chron. iv. 41-42; v. 1-25.

The descendants of Levi were not reckoned among the tribes of Israel when they were brought over the territory of the Canaanites by the numbers of the tribes was actually less than the division of the descendants of Joseph into two tribes which were named after his sons Ephraim and Manasseh (Numbr. i.) a certain number of persons appears to have been necessary to constitute tribes and families. (1 Chron. xxiii. 11.)

These twelve tribes were united in one republic, which was generally, though not always, had a chief magistrate, whether a lawyer as Moses, or a general as Joshua, or a judge as those whose history is the most entertaining, who was a king as Saul and his successors. With regard to the judges however, it is highly probable that some of them ruled not over all Israel, but only over single tribes. The twelve tribes met in general diets (Josh. xvi. xxiii.; Judges xxvii.) and decided the business of the state. As to the independence of the separate tribes in the fact that David reigned seven years over the tribe of...
Judah alone; in the revolt of ten of the tribes from Rehoboam; and in the standing rivalry between the tribes of Judah and Joseph, which led to the appointment of an officer of the tribe. Before their appointment Moses was sole judge, and it was to relieve him from the burden of that office that a class of judges was instituted. (Exod. xviii.) The chief judge of these judges appears to have been left to the people, as Moses lays down no rules for their election. In subsequent ages it generally happened that they were Levites.

In Num. xi. 16, we have an account of the appointment of 70 elders of the people to assist Moses. These are commonly supposed to have been judges; and the foundation of the Sanhedrim, so well known in the later Jewish history, is traced to their appointment. Micha- elis takes a very different, and, we think, more correct view of their office. He considers that they were a senate chosen to take part with Moses in the government, and that the institution was but temporary. We do not find them mentioned in the subsequent history of the people, and the real Sanhedrim was not founded till after the Babylonian captivity.

The scribes were an order of officers quite distinct from the judges. This office was instituted during the Egyptian captivity. (Exod. v.) They were to be appointed in every city. (Deut. x, xi.) This office was not generally taken, like the judges, from the tribe of Levi. Their name (scriba) is derived from a root, which still exists in Arabic (sairan), meaning to write. From this and other circumstances it is concluded that they were the officers who kept the genealogical registers and apportioned the public burdens to every individual. They also conveyed to the people the general's orders in time of war. (Josh. xxii. 3. &c.)

Such was the Israelitish state, consisting of the congregation of the people, governed by the heads of families, the princes of tribes, the judges, and the scribes. To this democratic constitution the tribe of Levi formed a counterpoise. They had no landed property, but received the tithes of all the other tribes. Besides these they received the first fruits of all produce, probably about a sixth part of the whole crop; they had a part of every sacrifice; and while the people went out of Egypt and for forty years wandered in the wilderness, the priest was offered as a sacrifice, and afterwards the priest received a portion of every slaughtered beast that was not brought to the altar; they had everything that was devoted to God, and the redemption fees of the first-born of men and animals. Every king at Jerusalem paid the Levites a hundred and some minor articles. A calculation of these items would show that their revenues were enormous, and far more than is needed for the support of a body of religious instructors. But this was not the office of the Levites; and the circumstance of their living in cities of their own made the discharge of such an office impossible. They were indeed, in a different sense, the ministers of religion; for they performed all religious ceremonies, preserved copies of the law, explained it in doubtful cases, and were bound to read it over to the people once every seven years; but a body of religious teachers or doctors did not exist till after the Babylonian captivity. The Levites were the literate class of the nation, and filled all the learned professions. Difficulties were described by Oriental writers for judgment. (Deut. xvii. 8-13; xxxi. 25.) In the wilderness they formed a guard to the tabernacle and to Moses. The occasion of their obtaining the priest's office is related in Exod. xxi. 21-24.

The head of the Levitical order was the high-priest, who was always taken from the family of Aaron. He possessed great influence in the state. He was the supreme legal authority. In Deut. xvii. 12, he is placed on a level with the judge or chief magistrate; so in Num. xxv. 13, the high priest was the chief magistrate, as in the case of Eli. Moses did not determine what should be the nature of the supreme magistracy. Before his own death he appointed successors to the person of Joshua, who was a military leader, and whose office it was to put the people in possession of Palestine. Joshua was succeeded by the prophet Samuel, and then (at intervals) by the judges. (Deut. xvi., 12), but he gives no instructions for the appointment of the judge. The judges seem to have been somewhat analogous to the Carthaginian sufetes. They were not the ordinary and permanent magistrates, but they were deputed for the whole people in their regular succession of them, and it is by no means clear that all of them governed the whole nation.

The judges were succeeded by kings, of whom there was a regular succession from Saul to the Babylonian captivity. The kingdom of Israel seems to remain a free republic under the supreme government of Jehovah, and though when the people actually asked for a king, God, by Samuel, represented their desire as both foolish and sinful (1 Sam., viii.,); yet as Moses foresaw that this would work out evil, in imitation of surrounding nations, he gave the people power to choose one, and prescribed his duties (Deut., xvii. 14-20). This is one of the many instances in which Moses shows one of the highest qualities of a good legislator, in making the barest provisions which the circumstances allowed, instead of attempting to carry out his views of what was best where the character of the people made those views impracticable. The following are the chief laws respecting the king. The election of the king was left to the people (Deut., xvii.,) but under the restriction that he must be an Israelite by birth, not a foreigner (Ver. 15); the appointment must be one who had the sanction of God (Ver. 15), whose will on this subject was made known through a prophet, as we find from history (1 Sam., ix.,) that the choice was not made in private, but in public, nor a great number of horses (Ver. 16). This law was well suited to the physical condition of Palestine, a mountainous country, which could be defended without cavalry, and where the spirit of a people who could only arise from a spirit of conquest. This, like some others of the Mosaic laws, was disregarded by Solomon, who had an enormous number of horses. The king was forbidden to lead the people back to Egypt (Ver. 16), which probably means that he was not to be released to the slave trade. (Michaelis, vol. i., p. 64-67.) He was not to take many wives, 'that his heart turn not away' (Ver. 17), as happened to Solomon, whose wives seduced him to idolatry. Another reason of this law was probably to discourage polygamy by the example of the king.

This law was constantly broken by the kings of Israel. He was not to collect excessive quantities of gold and silver (Ver. 17). He was to be well acquainted with the law, of which he was to have a copy written out for him (Ver. 19), and to read it (Ver. 18, 19). On his obedience to these commandments depended the continuance of his kingdom (Ver. 20). Besides this fundamental law, there was an agreement or covenant between the king and the people, which was sworn to by the king and the people (1 Sam., xii., 45.) The kingly power was therefore not unlimited; but we find that the government of the kings had always a tendency to despoticism, which may be ascribed to the want of an hereditary military nobility, and to the notion which prevailed among the Israelites, in common with other Oriental people, that it was the office of the king in person to be supreme judge. As to the latter point, it certainly was not the intention of Moses that the burden of deciding causes should rest upon the kings, and very mischievous consequences resulted from their assumption of the office.

The king had the power of enacting new laws, provided they were not at variance with the fundamental principles of the constitution, and of dispensing with the punishments prescribed by them. He had the power of life and death over the priest, even the high-priest; and it was part of his duty to reform abuses in religion. These powers, which are not mentioned in the Mosaic code, are inferred from the ancient extent of power by the kings. Such matters probably formed part of the covenant made between the king and the people mentioned above. It is uncertain whether he had the right to declare war at his own pleasure.

On the subject of the royal revenues Moses left no ordi- nance. The king was to have no knowledge of the revenues of the priests, from the land (1 Sam., viii.,) and of a desmene which was probably acquired by confiscations. The kings had a right to demand bond-services of the people.

* This supreme magistracy must not be confounded with the ordinary judges mentioned above.

P. C. No. 967.

Vol. XV.—3 L
Salmon derived a considerable revenue from foreign commerce.

The foreign relations of the Israelites were of a simple character. Although, as stated above, it was a fundamental principle of the Mosaic law to avoid foreign intercourse, yet alliances with foreign nations were not forbidden. The alliances which were afterwards made, in the time of the kings, with Assyria and Egypt were sufficiently imprudent in their own nature to account for their being opposed by the prophets. There were however some nations whom the Israelites were commanded to exterminate—these Canaanites, namely, who dwelt in the land which they were to possess; this command was never perfectly obeyed, and in later times it was mitigated. Other nations, as the Amalekites, Ammonites, and Moabites, were regarded by Moses as the hereditary enemies of the people of Israel, on account of injuries which they had done them, and which it was their duty to revenge when an opportunity occurred. The laws regulating war against other nations (Deut., xxv.) were excepted from the law against all nations. The greatest assistance which is then recognised is sufficient to account for, and the cruelties exercised by their heathen enemies are known to have been greater than any that the Israelites could be charged with.

If a city resisted after being summoned to surrender, all the men in it were to be put to death, and the women and children made slaves. This law however only applied to the cities which were very far off; but as to the cities of the Hittites, Amorites, and others, which were given as an inheritance to them by God, they were not commanded to submit. The spoil was to be divided among the soldiers, except in some cases, when it was devoted to God and destroyed. Horses were to be harnessed. The fruit-trees in the enemy’s country were to be spared.

During the three great festivals, when every man went up to Jerusalem, there was a suspension of arms, the assurance being given by God that during these periods no man should desire their land. (Exod., xxxix. 24.) Michaelis endeavours to show that this truce was observed by all the surrounding nations except the Canaanites, who were therefore destroyed.

Embassies were only resorted to on particular occasions, and the persons of ambassadors were sacred. When the Israelites wanted to pass through the territories of other peoples, permission from the king of the land was required. The foundation of the civil law of Moses is laid in the command, “Thou shalt love thy neighbour as thyself.” (Lev., xix. 18.)

1. Laws relating to Property.—Moses ordained that after the conquest of Canaan the lands should be divided by lot in equal portions among the Israelites, and should then be inalienable for ever. This law was invested with a religious sanction, by representing God as the proprietor of the whole land, and the people as only held of him as under a lease. (Lev., xxv.)

The land might be sold nominally, but as it reverted to the original owner or his heirs in the year of jubilee, which was every fifty years, such a sale amounted only to the sale of the crops for fifty or fewer years. Labourers might be redeemed on certain conditions before the year of jubilee. (Lev., xxv, 5, &c.) The law against the alienation of land admitted of exceptions, the chief of which was that land vowed to God, if not redeemed before the jubilee, would pass to the priests. (Lev., xxvii. 16.)

Moses however plainly intended that land sold or vowed should always be redeemed before the jubilee. A provision was made for avoiding litigation respecting the crops upon the ground at the jubilee, by the institution of the jubilee court which was to be neither the sowing nor reaping, but all the land was to lie fallow. Every seventh year, and likewise the year of jubilee, was a sabbatical year. A promise was annexed to the law, that the crop of the sixth year (or perhaps we should read of the sixth years) should be sufficient to afford food while the land lay fallow. (Lev., xxv. 29-32.)

Michaelis is of opinion that the tendency of this law was to increase the national wealth in that a long period was reserved during the six years of plenty, part of which might be sold at an increased price to the neighbouring commercial nations in the seventh year; but this seems a very unsatisfactory explanation of the matter. He also mentions other views which tend to make him consider them, of this institution. (Mich., Arts. 74, 75.)

The laws of the jubilee and sabbatical years do not appear to have been long observed; indeed it is plain from Levit., xxv. 34, 35; xxxiv. 22, that these expectations were not fulfilled. From 2 Chron., xxxvi. 21, it appears that up to the Babylonian captivity there had been seventy sabbatical years neglected. This would carry us back nearly 500 years, namely, to the reign of Saul or David, as the time at which this observance ceased.

A man’s property descended to his sons, of whom the eldest had a double share. (Deut., xxi. 17.) The exclusion of daughters from the inheritance was established long before the time of Moses. (Gen., xxiii. 14.) No proviso is made in the law for the support of unwedded daughters. On the occurrence of a case in which a man died leaving only daughters, Moses made the law that in all such cases the daughters should inherit their father’s property, but in the case of a man having sons and daughters, the bands of such heiresses were reckoned as the sons of their father-in-law, and took his name. Failing daughters, the inheritance passed to a man’s brethren; failing them, to his father’s brethren; and failing them, to the next of kin of the same generation. The law advised the king to issue directions as to determining who are the next of kin: probably this was already determined by custom. The Mosaic law contains nothing on the subject of wills; but we find that the right of bequeathing property other than land existed both before and after his time, and he nowhere prohibits it.

2. Laws relating to Persons.—The laws of Moses incalculate the most complete filial obedience. (Exod. xx. 12; compare Ephes. vi. 1-3.) The power of fathers over their sons was very great, and does not appear to have ceased as it grew up. We have here a remnant of the patriarchal state. Flagrant acts of disobedience were punished with death. (Exod., xxi. 17; Levit., xx. 9), which however could only be inflicted by a judge appointed by the father (Deut., xxi. 18-21). Fathers, and even mothers, chose wives for their sons. Next to the father, the first-born had the greatest power over the family, though it does not clearly appear in what this consisted, nor whether it was increased by the heir’s marriage. The father’s lifetime was considered when the tomb was a first-born (Exod., xiii. 12), yet it is clear from Deut. xxi. 15, and 1 Chron., v. 1, 2, that the first-born of a family was the first born to a man of all his children, and not the first born by each of his wives.

The marriage law of Moses was analogous to that among other Oriental nations, wives were generally bought (Gen., xxi. 13-30; xxxiv. 12; Hosea, iii. 1-2), and in certain cases their price was fixed by law (Exod., xxii. 16; Levit., xx. 28, 29). Some wives were not bought, and these enjoyed greater freedom than the others. In certain cases concubines were allowed. (Exod., xxi. 7-11; Michaelis, Arts. 57, 88.)

The marriage law of Moses had in general a tendency to promote the propriety of the marriage act, which was by no means a sinecure; but the marriage ceremony was not prescribed. The union was not solemnised by any ceremony of marriage. We may conjecture from history (Gen., xxix. 22-29) that ceremonies much resembling those of the Arabs in the present day (Lane’s Modern Egyptians, vol. i. c. 6) were already in use, which Moses left as he found them. He confined himself to the marriage ceremony of the betrothal. The bridgroom might put away his wife if the niggia virginitatis was wanting (Deut., xxi. 13-21). A
right understanding of this law is very important to the explanation of the doctrine of Christian divorce (Matt., v. 31-32), which has had no small influence on the marriage laws of Christian countries. (Michaels, Art. 92, 93.)

Moses permitted polygamy, as is proved by the laws in Exod., xxi. 9, 10, Levit., xvii. 18, Deut., xxi. 15-17, by the custom of the priestly families of Moses and Aaron, and by his use connected with the fact that he nowhere prohibits it, and by the small number of the first-born compared with the whole number of males, namely, about 1 in 42 (Num., iii. 43). But he permitted it only as a matter of policy, 'on account of the great and ever increasing needs of the people,' that is, the difficulty of rooting out invertebrate cus-
toms, and perhaps for other reasons, which are pointed out by Michaels (Art. 96). Some of his laws have a strong indirect tendency to prevent it, for example, the buyer of a wife, and notwithstanding some striking examples of its practice, as that of Solomon, it does not appear to have prevailed extensively among the Is-
raeleites. (Mich., Art. 95.) After the Babylonian captivity it ceased entirely. Moses laid no set limits to the practice of polygamy, not allowing many wives. (Deut., xxii. 17.) Moses prohibited marriages between certain near relatives, some of which, those namely between parents and children, brothers and sisters, he considered as opposed to natural morality, and acknowledged as divergent from the character and habits of the people. (Levit., xviii. 20; Michaels, book iii, c. 7.) Moses did not make any favourer, at least if we may judge by the way in which he speaks of the marriage bond in Gen., ii. 24; but he allowed it to a greater extent than he altogether approved, 'because of the hardness of their hearts' (Matt., xix. 9). The law of divorce is in Deut., xxiv. 1 and 4, 6. Moses allowed a wife, if she should leave her husband, to give him his marriage portion by giving him away by giving her a writing of divorce. She might then marry again; but if her second husband put her away or died, she might not return to her first husband. (Mich., Art. 94.) Moses distinguished between Deut., xix. 19, 29. The support of a widow after her husband's death was provided for, if she had no children, by the law of levirate marriage; if she had children, it was left to filial piety.

Loans respecting Slaves and Servants.—Moses found slavery already existing among the Israelites and their neighbours. He permitted it to continue, under certain restrictions, and his laws on this subject are conceived in the protection of the poor toward the rich (Exod., xxi. 15). Slaves were acquired by capture in war, by purchase, and by the marriage of slaves. Of purchase there were four kinds: 1, when a slave was transferred from one master to another; 2, when a man undertook to buy a slave as a hired servant to work upon his own land; 3, when parents sold their children; 4, when an insolvent debtor, or a thief unable to make restitution, was sold as a punishment. The value of slaves was of course variable, but in two cases it was fixed by law (Exod., xxii. 22; Levit., xxvii. 1-8). Besides the slaves of private individuals, there were others who belonged to the public; these were employed in menial labours for the service of the sanctuary. Slaves might have property of their own. A master might beat his slave, but not so as to kill him (Exod., xxii. 20, 21); if he even harmed him, the slave was to be set free (Exod., xxvi. 27, 27). A Hebrew slave possessed this advantage over a foreign one: he was entitled to his freedom in the sabbatical year and in the year of jubilee, and he might be redeemed before the year of jubilee (Levit., xxv. 10-13). The reason for this is that the sabbatical year was not a year of servitude. Moreover, the manumitted slave received presents from his master (Exod., xxi. 2-11; Levit., xxv. 39-55; Deut., xv. 12-18). Slaves had to conform to some of the principal religious ceremonies. Besides the slaves there were day labourers, who were to share in the rest of the seventh day, and in the spontaneous produce of the sabbatical year, and whose hire was to be paid every day before sunset (Levit., xix. 13; xxv. 6; Deut., xxiv. 14, 16). The sabbatical year was itself a time of literal meaning; probably meant also that servants were to share in the food they prepared for their masters.

The Goel, or Blood-Avenger.—There was a custom of antient standing among the Israelites, and which exists to this day among the Arabs, which made it the duty of the

nearest relation of a murdered person to pursue the mur-
derer and kill him with his own hand. This relation is called in Hebrew Goel, in Arabic Ta'aka. This usage, which was probably of high antiquity, is dangerous to any state, from the haot and passion in which vengeance is exercised, and from the hereditary feuds which it causes between the different families. Moses dealt with this as he dealt with other less established customs of which he disapproved, not making the vain attempt to root it out, but surrounding it with provisions calculated to mitigate its evils. Six cities of the Levites were appointed as cities of refuge for the manslayer, and the persons wrecking violence and profaning the name of God, as a place of asylum. If he escaped to one of these, he was safe from the avenger of blood (Exod., xxi. 12, 13; Num., xxxvii; Deut., xix. 3). But these cities afforded no asylum to the willful murderer, who, when proved to be guilty, might be torn even from the altar (Exod., xxi. 14; Deut., xix. 11-13). At the death of the high-priest, the person who had taken sanctuary might leave the city of refuge in safety. These laws seem to have acted as an effectual check on the practice of blood-
avenging, for an instance of it rarely occurs in the later history of the Israelites.

The Mosaic law commanded kindness to be shown to strangers, who, unless they belonged to certain nations that had been guilty of flagrant outrages against the Israelites, might 'enter into the gates of the Levites,' be clothed, be fed and be naturalised in Israel. Moses inculcates veneration for old age, and kindness to the dead and blind (Levit., xiv. 13, 38; Deut., xxvii. 18). He made laws in favour of the poor (Deut., xv. 11), besides adopting usages already in existence for the benefit of the poor and the aged. He caused children of the aged and orphans to be supported, and as many widows as he could find. He recommended the people to lend to them (Deut., xvii. 7-11), he gave them the right of cleaning, and of collecting the spontaneous produce of the earth during the sabbatical year (Levit., ix. 9, 10; xxv. 5, 6; Deut., xix. 19; Ruth, ii. 2-3), and the remains of the second tithe and firstlings, which were sacrificed as thank-offerings, were given as entertainments to the poor (Deut., xii. 5-12, 17-19; xiv. 22-29; xvi. 10, 11; xxvii. 12, 13).

Personal Relations.—Moses had in the present chapter of his law declared binding, though the making of them was neither encouraged nor discouraged. They were remissible in cer-
tain cases (Levit., xxvii.; Num., xxxvii.; Deut., xxii. 21-23).

On many points relating to debt, the Mosaic law is silent. An insolvent debtor was liable to have his hereditary lands seized, also his houses and other property, his clothes (but with a humane restraint, Exod., xxvi. 27, 27), and his person; he might be sold into slavery with his wife and children (Levit., xxii. 25). The Mosaic law knows nothing, and still less of torture, though both have been attributed to it from a misunderstanding of some passages in the New Testament (Matt., v. 20; xviii. 30, 31).

Pledges were allowed to be taken, under certain regulations which were meant to secure the debtor from the rapacity of his creditor (Deut., xxiv. 6, 10-13; Exod., xxvi. 27). Of suretyship the Mosaic law says nothing, but it is frequently referred to in the 'Proverbs' of Solomon. Interest on loans, whether of money or produce, was forbid-
den to be taken from Israelites, but it might be received from strangers (Exod., xxii. 25; Levit., xxv. 32, 37; Deut., xxii. 19, 20). The reasons for this prohibition appear to be founded entirely on the peculiar policy of the Israelites. (Michaels, Art. 155.) Loans are regarded by Moses as alms. In the seventh year a poor debtor could not be sued, as there were no crops on the ground (Deut., xv. 1-11). It does not appear to be the meaning of this law, that debts were cancelled in the seventh year, though perhaps such a release took place in the year of jubilee. Injuries done to property were to be compensated, and things found were to be restored to the owners; there are several laws on the details of these cases (Exod., xxii. 21-26; Mich., Art. 184).

The Mosaic law contains several enactments on behalf of beasts, many of which have a tendency to preserve the breed of such as are useful to man.

Police Law.—1. Civil Police. The population was to be as-
seured by the obligation to make a census, the limits of which had been specified in the statute. Every individual numbered paid a capitation tax of half a shekel. (Exod., xxx. 11-16.)

2. Military Police.—Every man above 20 years old was liable to be called out to war. (Num., i. 3-4; xxii. 2.) But generally a selection was made by the Shechem, who

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also appointed the officers. Under the kings permanent officers were appointed. Exemption from military service was allowed to the man who had built a house and not yet occupied it, to him who had planted a vineyard or oliveyard and not yet enjoyed its fruit, to him who had betrothed a wife, and to him who had married within a year. (Deut. xx. 5-7.) Cowardice was also a ground of exemption, but attended with disgrace. The spoil of cities and nations and cattle was collected and distributed among the people, those who went to war and those who remained at home having equal portions, and that in effect was the property of the soldier who seized it. Many regulations are made to promote cleanliness and discipline in the camp, with which this object was declared to be sacred.

3. Ecclesiastical Police, or the Ceremonial Law.—In this part of the Mosaic law many ceremonies are ordained which appear frivolous and unmeaning, unless we view the fact asserted both in the Psalms and in the New Testament, and truly explained in the Epistle to the Hebrews, that most of the Levitical rites were only types of the blessings to be enjoyed under the Christian dispensation. We do not enlarge on this subject, as we are not here regarding the Mosaic laws in their theological aspect.

Circumcision, which had long before been given by God to Abraham, was adopted in the Mosaic law as the ceremony by which the civil privileges of the Hebrews were to be extended to the civil privileges of the people of Israel. (Gen. xvii. 9-14; Levit. xii. 13.) Every bond-servant among the Israelites was obliged to submit to this rite, and also every stranger who wished to be naturalised among the people and was allowed to remain among them. Offerings were of three kinds: 1. Bloodly, consisting of slaughtered animals, which must be those regarded by the law as clean. They were either burnt-offerings, which were wholly consumed on the altar; sin-offerings, made on account of any sins committed through ignorance, of which only a part was laid on the altar; or peace-offerings or peace-offerings, of which only the fat parts were burnt and the rest eaten. 2. Unbloody, or meat-offerings, consisting of meal, bread, &c. 3. Drink-offerings, consisting of wine, of which the priest rejoiced in the company of the people and of the priests. Sacrifices might only be offered at the place which God might appoint, which in the wilderness was the tabernacle: this law was doubtless intended to prevent idolatry. Besides their typical significance, these sacrifices had important moral and physical advantages, which are pointed out by Michaelis. (Acts. 189-191.)

Two titles of all the produce of the land were due to God. The first was paid to the Levites for their support, and the second was given to the priests. This is in addition to the tithes, the first-born of all animals, including man, were sacred to God, and belonged to the priests. This law had its origin in the sparing of the first-born of the Israelites when the first-born of the Egyptians were slain. The first-born of woman might be offered in sacrifice, but not to be redeemed, but those of other beasts and of man might be redeemed at a fixed price. (Exod. xiii. 2, 11-16; Levit. xxvii. 26; Num. xviii. 15-19.) The first-fruits of crops and other produce belonged also to the priests (Levit. xxii. 9-14; Num. xv. 21-28; xiii. 13-19; Deut. xxvi. 4-5.) There was another sort of firstlings which were employed for feast-offerings (Deut. xii. 6; xiv. 23; xv. 19-21; 2 Chr. xxiv.)

The Sabbath.—Every seventh day was a day of rest and of religious worship. This was no new law of Moses; it had been enjoined upon man, at the creation of the world, to celebrate the resting of God on the seventh day. (Gen. ii. 2.) In the Mosaic law it was also a commemoration of the deliverance of the Israelites from Egypt, and some of the peculiarities in the Jewish observance of the day are undoubtedly connected with that fact. No servile work whatever was to be done on the Sabbath, except what was necessary to the sanctity of the Sabbath, but transgressing this law was death. (Exod. xxvi. 32-30; xx. 8-11; xxii. 12; xxxi. 12-17; xxxv. 21; xxxvi. 1-3; Num. xv. 32-36; Deut. v. 12-15.)

There were three annual festivals, each lasting seven days. The Passover and the Pentecost were fixed at the place where the sanctuary stood. (Exod. xx. 13-17.) These were—1. The passover, to commemorate the passing over of the Israelites by the destroying angel when he slew the first-born of the Egyptians. It fell on the evening after the 14th day of the first month of the year, that is, very near the vernal equinox, and at the beginning of harvest. 2. The feast of Pentecost was held at the end of harvest, on the 40th day after the 16th of the first month. It was a feast of thanksgiving for the harvest. 3. The feast of tabernacles began on the evening of the 14th day of the seventh month, about October. It was a feast of thanksgiving for the fruitage and vintage. Laws relating to the festivals and the account of the other feast days will be found in Michaelis. (Arts. 197-201.) He reckons that in the whole year there were 37 feast days, besides the 52 Sabbaths.

Many of the regulations of the present life of the Israelites are regulated by the Mosaic law with great precision. The laws on this subject may be divided into two classes. 1. Regulations respecting meats, and their distinction into clean and unclean, with the prohibition against eating blood. 2. Laws relating to the defilements, ritualistic and moral, concerning leprosy. Both these classes of laws conducted greatly to the preservation of health and morality, and formed a strong barrier against idolatry. (Michaelis, Arts. 202-217.) For an account of several miscellaneous precepts of the Mosaic police law the reader is referred to Michaelis, book iv., c. 5.

Respecting the criminal law of Moses we have not space to enter into details. It is ably treated by Michaelis, and a more complete work on the subject is but a few pages away in the same volume. Michaelis has shown how the Mosaic institutions are distinguished by equal justice, and by a grave punishment according to the enormity of crimes. Some offences, especially those of a religious character, were punished with a severity which to us may appear excessive. It should be observed that this is only one of the reasons why the people were regarded as set apart to preserve the worship of the true God, and according to which it was a matter of the first importance to remove every defilement from among them. The Mosaic penal law introduced a vast improvement, by the precise rule of punishment for the crimes of the fathers, and fathers for those of their children. (Deut. xxvii. 16.) The punishments are not cruel. They were—1. Death by the sword, or by stoning. 2. The lot was allowed in the case of persons by infinctions on the corpse of the criminal. There were no penalties greater than effaced torture. 3. Exile, or exclusion from "the congregation of God." 3. Corporal punishments. 4. Fines. 5. Offerings to make amends for sin: these kept up the idea that all offences were committed against God, and were punished not for the living were degrading; for stripes are not considered so by Oriental nations, nor were they by the Hebrews.

Of the form of judicial procedure little is known, except that it was extremely simple. The purity of the judicial seat is guarded by several statutes against bribery and partiality. Causes were heard in the gate of the city, according to immemorial usage in the East; and thus publicity was secured, as the city-gate was the common place of resort. Moses ordained that in every case of punishment which of whom two or three were necessary in capital cases, were examined upon oath. (Levit. v. 1; Numb. xxv. 33; Deut. xvi. 6, 7.) In some cases oaths of purification were required from the accused. (Levit. vi. 2, 3.) Sometimes a reference was made to God by lot in all cases; and in criminal cases this lot was occasionally resorted to, but only for the discovery and not the conviction of the criminal. A criminal's confession might convict him capitally. (Josh. vii. 21; Num. xxxi. 37-43; 1 Sam. iv. 13-16.) Moses did more, in which appeals to rewards and punishments in another life as a sanction for his laws.

The greatest care was taken to preserve the law. One copy of it was written in a book which was deposited in the sanctuary, and which the ark was carried, and in the ark (xxvi), and another copy was engraved on stones, which were fixed on Mount Gerizim or Mount Ebal (probably the former) with solemn ceremonies, in which the people swore to keep these blessings were invoked on the obedient, and curses denounced on the transgressors. (Deut. xxvii., xxviii.)

Viewed as a whole, the laws of Moses seem perfectly adapted to the character of the people for whom he legislated, and to the physical and moral condition of the country they were to inhabit. No mistakes can be greater than that which is made by many people when they suppose that because these laws came from God, therefore they are the best code that can ever be formed. Had they possessed
this ideal excellence, they would have been really bad laws, because they would have been unsuited to the nation they were intended to govern. They were not meant to be unalterable; indeed some of them were altered by Moses himself. They were only intended to last for a time, and therefore, when considered with reference to our present experience of human affairs, they appear to have many imperfections.

The orphans of the Mosaic legislation is declared in Scripture to be from God, by which we must understand that these laws were sanctioned by God and published by his command. It has already been observed that many of the laws did not originate with Moses, but were antient observances which he adopted in his code by the command of God. (See also Iken, Diss. II. de Institutis et Ceremoniis Legis Moscae ante Moese; Reimar, Cogitationes de Legibus Mosaeis ante Moesen.) And moreover, when we remember that he was brought up in Egypt, and was 'learned in all the wisdom of the Egyptians' (Acts vii. 22), when we compare various parts of his laws with similar institutions which existed in Egypt (for example, the freehold basis of the constitution, the separation of the caste of priests from the rest of the community, the discouragement of commerce, as well as for keeping the Israelites distinct from other nations), it becomes highly probable, if not certain, that the Mosaic institutions were largely modelled on those of Egypt. This opinion, which is held by nearly all rational men who have examined the laws of Moses, has been unaccountably regarded as opposed to the divine character of these laws, as if divine inspiration must necessarily deprive a legislator of the wisdom which he already possesses, and prevent him from adopting, under the sanction of inspiration, whatever good he may find in the institutions of other nations. On the other hand there are many points of opposition between the Mosaic and Egyptian laws which it is impossible to overlook. Several of these are adduced by Michaelis, in a paper 'On the Mosaic Law,' and the like, "De legibus quibusdam in Mose eruditis, ut Israelitis Egipti cupidissimae cunctarum aetatim." The spirit of the whole law was, as Moses himself asserts (Levit. xviii. 3), diametrically opposed to that of the Canaanites as well as the Egyptian institutions. For these reasons it is impossible to regard the Hebrew legislation as a mere copy of the Egyptian.

Some divines of the Rationalist party have maintained that Moses was not the author of the whole of the legislation of the Pentateuch. This opinion is opposed to the evidence which exists in favour of the genuineness and authenticity of the books of Moses. [Pentateuch.]

The following very useful table of reference is taken from Wilson's Archæological Dictionary, where it is said to be taken from a MS. in the library of John Betham's College, given by Archbishop Laud, and probably either compiled by his Grace, or by his direction.

The First Class.

The Moral Law written on the Two Tablets, containing the Ten Commandments.

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<td>20. 13</td>
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<td>The First Commandment, 20. 23, 34</td>
<td>19. 26, 18</td>
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<td>15. 10, 11, 12, 13</td>
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<td>The Second Commandment, 20. 23</td>
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<td>The Third Commandment, 20. 23</td>
<td>23, 31</td>
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<td>19. 16, 17</td>
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<td>The Ninth Commandment, 22. 23</td>
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<td>The Tenth Commandment, 20. 5</td>
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The Second Class.

The Ceremonial Law may be simply reduced to the following heads, viz.---

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<td>Of the Laver of Brass, 20. 26, 43</td>
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THE THIRD CLASS.

THE POLITICAL LAW.

N. B. The magistrate is the Keeper of the Precepts of both Tables, and to have respect to human society; therefore the Political Laws of the Israelites are referred to both the Tables, and are reduced to be several of the Precepts of the First Table, namely:

1st. To the First and Second Commandments, v.i.
2nd. To the Third Commandment, v.i.
3rd. To the Fourth Commandment, v.i.
4th. To the Fifth Commandment, v.i.
5th. To the Sixth Commandment, v.i.
6th. To the Seventh Commandment, v.i.
7th. To the Eighth Commandment, v.i.
8th. To the Ninth Commandment, v.i.
9th. To the Tenth Commandment, v.i.

Professor of philosophy in the university. At the revocation of the duke of Brunswick he became professor of theology in the university of Helmstedt, where he remained from 1723 to 1727, when he was appointed professor of theology at Göttingen and chancellor of the university. Here his lectures on theology attracted all classes of students. He died on the 9th September, 1755, at the age of 61. He was three married, his first wife having been his daughter, and his third wife his daughter, afterwards Duchess of Noailles.

Moosheim was generally distinguished as a preacher. His style was formed on the model of the great English and French preachers, Tillotson and Watts, Saurin, Massillon, and Fléderer. He has been compared to Fénelon for the graces of his style, and he is considered one of the founders of the modern German literature. His talents were of a very high order, his learning was immense, and his character was exemplary.

The whole number of Moosheim's works is 161. He himself published at Helmstedt, in 1731, a catalogue of the works which he had published up to that time. His best known work is the "Institutiolem Ecclesiasticum, Antiquitatum et Recentiorum," which, first published in Latin, was, in 1764, published in 4to. In 1744, just before Moosheim's death, he published, with an account of Moosheim's writings by Miller, one of his pupils. It was translated into German by Von Einem, and by J. R. Schlegel. Schlegel's translation is the better, and is excelled only by the Spanish translation. It has also been translated into French, Dutch, and English. The first English version was made in 1764, by Dr. Macalлист, an assistant minister at the Hague, and has been frequently reprinted. It is very unfaithful. Dr. Macalлист's professor of theology was also a famous professor, by another's style, and has also been translated into Dutch, and has been also translated into French, and has been also translated into German, and has been also translated into English.

That is, to say, on the beginning of the eighteenth century. Each century was treated of separately, under the two heads of External and Internal History. The External History comprises the efforts of its public rulers and private members, and the political events of a community are said to be external to it; and lastly, it imposes on the historian the necessity of deciding what no human mind can decide, namely, whether events are prosperous and what calamitous to the Church. But the work of Moosheim is open to a graver objection. He has not treated his subject with the proper spirit of pious interest, though his own orthodoxy is unshaken.

Nevertheless, his deep knowledge, his patient research, his learned and impartial manner, and his philosophic spirit, entitle Moosheim to a place among the best church historians.

His works gave an impetus to the study of Church history in Germany, which has produced, among other works, those of Pfaff, Baumgarten, Wallis, Senumi, Schöneck, Henke, Schmidt, and Mosheim himself. His work on the schism of the Church is the fullest, extending to 45 vols. 8vo. Neander's "Kirchengeschichte" is still in progress; when completed, it will probably be the best that has yet appeared. Our own literature is very deficient in such works; but recent studies and new books are a study of ecclesiastical history in England, especially at Oxford.

Moosheim published several works on Church history, being the most important the "De Rebus Christianorum et Cæstorum," and "Institutiones Historiarum Christianarum Majores," which is a full Church history of the first century. Among its other works are, a Latin translation, with notes, of Cast
worth's *Systema Intelllectu,".Jena, 1738; six volumes of *Sermens," and nine volumes on the *Moralis of Holy Scripture," 1773.

MOSQUE (from the Arabic Masjid or Medersah, and intermediately the Spanish and Portuguese Mezquita and Mezquiria), a Mohammedan place of worship, the distinctive marks of which are generally cupolas and minarets. Internally they exhibit nothing remarkable as to plan or accommodation, forming merely a single large hall or apartment, with pillars or columns or other fittings-up, and with no other decoration than the beautiful mosaic or arabesque work which covers the domes and mosaics on the walls. In regard to these latter, some of the mosques at Cairo are highly embellished. Although more famed than any other, the mosque of Santa Sophia at Constantinople, a workmanship of Mohammedan or Arabian architecture, but was originally built as a church, and is in the Byzantine style.

MOSQUITO, a term applied to certain stinging flies belonging in all probability to several distinct genera. The males are either gnats or gnat-like insects, which are furnished with a proboscis adapted for piercing the flesh, and at that time forming a kind of siphon through which the blood flows; this instrument moreover injects into the wound which it makes a poison which causes inflammation. Anopheles, or the pox-bearing midge, is placed by some ornithological authorities among the same tribe as the common gnat (Culex, Linn.); Humboldt however asserts that the insects known by that name in America belong to the genus Simulium, and that the *Culicis, which are equally numerous and annoying, are confined to the Florida peninsula. The females are for the most part of a deep-brown or blackish tint, and are thus characterised:—fourth joint of the palp rath elon- 
guared and slender; antennae cylindrical, 11-jointed; eyes round, ocelli wanting; basal joint of the tarsi as long as the others taken together; wings very broad, basin and marginal veins usually developed.

M. Macquet, in his account of the habits of the species of this genus, says, 'They frequent the leaves of shrubs under trees, and live upon the juices found upon those leaves, especially such as are produced by the plant-lice; they do not feed on coniferous or other trees which have nourishment, but when opportunity offers, like gnats, they suck the blood of animals and produce an equally painful wound. Their proboscis is more complicated than that of the gnats, consisting, as in other *Tipulidae, of a tibia and tarsus, and the parts here more developed than usual. These minute flies are constantly in motion, and in running apply the whole sole of the anterior tarsus to the plane upon which they may be moving; they move with so much swiftness that their fore-legs are sometimes seen in motion.'

MOSQUITO SHORE. [CENTRAL AMERICA.]

MOSS. [CHRISTIANIA.]

MOSSES. [MUSC.]

MOUSUL, or MOOSUL. (Al-Mountal, in Arabic), a large town, on the right or west bank of the Tigris, in a low and flat country on the road from Bagdad to Diarbekr and the high land of Armenia. It is likewise on the road from Bagdad to Aleppo (Haleb) and Asia Minor. Caravans trade between Mousul and Aleppo, carrying to the latter place call-nuts from Persia, and Indian goods from Bassorah, which they exchange in Syria for European manufactures. Indian goods are also forwarded to Tokat, in Asia Minor, from whence copper is received in return, and sent down the Euphrates to Bagdad. Notwithstanding the favorable position of Mousul, its trade, which was once considerable, is now reduced very low. The only manufacture now carried on to any extent within the town is that of coarse cotton cloths, dyed blue, and used by the lower order of the inhabitants. Mousul was formerly known under the name from Mousul, where they were first manufactured. The Arabic spoken at Mousul differs considerably from that of Cairo, and even from that of Aleppo; it has a mixture of Turkish, Persian, and even Indian words in it. The population, which is said to be rather less than 50,000, is chiefly composed of Mohammedans, consisting of Arabs, Turks, and Kurds. The Christians are about 1800 families, namely, 1000 of Chaldeans, who have nine churches, four of the Latin or Western communion, and six of the oriental or Syrian Greek church, who have three churches; and 300 families of Jacobites or Eutychians, who have two churches. The Catholic or Latin bishop of Diar- bekr, or of Chaldees, resides here. There are also about 300 Jewish families, who have a synagogue.

The government of Mosul is in the hands of a pasha of two tails, who has a very limited territory and is independent of the government of Bagdad, and receives his investiture from the sultan. He keeps a force of about 1000 men, chiefly cavalry.

The town is surrounded by a wall; the streets are narrow and unpaved. There are several bazaars, numerous coffee-houses and battle-houses and bakeries, and thus like the Mass, deprived of no small portion of its devotional character. Many attempts have been made to discover whence the word is derived, but without any satisfactory result.

MOTH, the English name of the insects belonging to that section of the Hymenoptera which is called by the naturalists the Lepidoptera study of insects. A bridge of boats connects Mosul with the eastern bank of the Tigris, where some mounds are supposed to mark the site of ancient Nineveh. [NINEVEH.] (Buckingham's *Travels in Mesopotamia."

MOTAGILLA. [SYLVIAE.] MOTALA-ELF. [SWEDEN.]

MOTET (Motetto, ital.), in Music, a vocal composition set to sacred words, and used in the Catholic church. The word was synonymous with anthem, when first introduced, and signified a superior kind of hymn, accompanied only by the organ. [ANTHEM.] Latterly however the Motet has lost much of its primitive somnolence, having been, for considerably more than half a century, written with full and florid ornaments, and, thus, like the Mass, deprived of no small portion of its devotional character. Many attempts have been made to discover whence the word is derived, but without any satisfactory result.

MOTHIE, the English name of the insects belonging to that section of the Hymenoptera which is called by the naturalists the Lepidoptera study of insects. In 1639 he was admitted into the Academy. Cardinal Richelieu was pleased with his work on the education of a prince, intended to appoint him preceptor to the dauphin, but the queen, Anne of Austria, refused her consent. Notwithstanding this, in 1649 he was entrusted with the education of the young duke of Orleans, whose astonishing progress under the tuition of Le Vayer induced the queen to acknowledge the talents of the master and confide to him the completion of the king's (1XIV.) education.

He died in 1672, in the 28th year of his age.

Of his numerous works, which obtained extraordinary success, the most important are: 1. *Discours de la Contra- 
ideté d'Humeurs qui se trouve entre certaines Nations, et 
singulièrement la France et l'Espagnole," Paris, 1636, 
8vo. The title-page states it to be the work of Louis 
Michel LeBlanc, the Italian of Fabrizio Camplini, 2. *Considérations sur 
* L'Eloquence Française," 1638, 12mo. 3. *De l'Instruction 
da Mons. de Dauphin," 1640, 4to. 4. *De la Vertu des 
Pères," Paris, 1642, 8vo. 5. *Lettres à la Comtesse de 
P. Passages, in which the whole col- 
clections of his works have been made; but the best is that of 
Dreven, 1756-59, 14 vols. 8vo., the materials of which were 
-faced to the emperor, nephew of the author. La Mothe is styled the Historiographer of France by Vol- 
sare (Sire de Louis XIV.), who also mentions him as a 
norious Pyrthonist.

The great diversity of opinion which La Mothe observed in the world seems to have laid the foundation of that seep- 
icism which pervades his writings. His society was eagerly 
sought by all the learned and Kurdistichized persons of his 
time, and he was readily admitted into the brilliant circles of 
Modemoeselle Gounary, who at her death bequeathed him 
his library; but from the vulgar and prejudiced part of the 
public in general he only received contempt. Passing one day 
der the galleries of the Louvre, some one pointing to 
him, cried out, 'There goes a man with no religion!' "My 
friend," replied La Mothe, 'I have religion enough to for- 
give you the insult.'

He was nearly fifty years of age before he published his 
first work. From that time (1636) he published regularly 
every year. His work *De la Vertu des Pâles" was 
answered by Arnauld, in a tract entitled *De la Nécéssité de 
la Foi en Jesus Christ. La Mothe's book not salling so 
san as the bookseller desired, he made great concessions; 
'I have a method that will facilitate its sale,' said the 
author, and immediately procured a prohibition against the 
reading of it, which had the desired effect, for the work 
as read with admiration, and every copy sold off. (Biqog. 
Votariet."

MOTHER-OF-PEARL. [SHELL.]

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MOTHER-WATER.

When any saline solution has been evaporated so as to deposit crystals on cooling, the remaining solution is termed the mother-water, or sometimes merely the moths.

MOTION is change of place; there has been motion when a body, past a given time, occupies a part of space different from that in which it was at a preceding time. The only additional necessary conception is continuity of change: every point which has moved from one point of space to another must have passed over every part of some line, and not have been drawn from the first to the last by the formation of a line, if we had not formed lines by the intersection of surfaces. We say, though we have no certainty, but we do not forget that many philosophers are of opinion that such ideas as those of internal motion are only fictions, resulting from our rational organization, and (if we do not mistake them) anterior to observation, or, at least, not derived from it. This question is here immaterial, as we suppose all parties ready to start with a definite notion of time. Considering the changes which at the same word the time. We it is apply the word, as we do terms of magnitude (see that word) to changes of the moral system, as in speaking of the motions and emotions of the mind.

If there were anything which would need neither definition nor comment, it might be supposed to be simple motion, a thing never absent from one moment of the waking perceptions, nor even of the dream. Its existence was however denied, or is reported to have been denied, by various of the Greek sophists, though it is highly probable that Aristotle and the historians have handed down as a deliberate opinion what was merely meant for an ingenious attack on one or another established school. According to Sextius Empiricus (i. § 17), Dioclesus surnamed Cronsus, a Carthaginian, was accused by the sophists of existence of matter moves, it is either in the place in which it is, or the place in which it is not; but it cannot move in the place in which it is, and certainly not in the place in which it is not; consequently it cannot move at all. To which the sophists replied, the utmost at all, men never die, for if a man die, it must either be at a time when he is alive, or at a time when he is not alive. A better answer would have been, that it is true of all material phenomena that they happen either in the place in which they happen, or in the place in which they do not happen. The sophists exclude the latter from consideration. Zeno of Elea (not the Stoic) gave the celebrated argument of Achilles and the Tortoise. [PROGRESSION.]

If we consider merely motion, without any reference to the quantity of external force required to move it, we have, as we conceive, a subject of pure mathematics before us, though this has been contested. Newton however used considerations of motion without hesitation in his Fluxions; and his successors, by the unexcelled advantage of his calculations, which, however consonant they may be to conventional ideas of rigour, have never failed to introduce perplexity and obscurity to the beginner. It may be right to remind the student that the change of place introduced by Euclid (i.e. prop. 4 and other propositions) has not necessarily all the concomitants of the idea of motion; geometry would not interfere to prevent the superposition of being made without the notion of the triangle, whose place is changed, passing through the interior of the space. It is the conception of the change of time which the parties who objected to the doctrine of fluxions repugned. But if we consider matter in motion, we must inquire into the external causes of motion, and the capabilities of material objects to move. We shall do this in the present article [Morton, Laws of], confining ourselves in the present one to the first-mentioned branch of the subject.

Next to the idea of motion comes that of swiftness, rate of motion, or velocity (see also the latter word), suggested by the proposition of motions of different places in the same time. But here we must observe, that we are rather indebted to motion for our measure of time than to time for our measure of motion. If sentient beings, like ourselves, had not at all times a perpetual day, but then any recurrent periodic phenomena in nature, or any mechanical means of generating equable motion, we have no right to suppose that they would ever have learned to consider time as a measurable magnitude. They might admit that it might be more or less, as we do of industry, courage, or any other moral qualities [MAGNITUDE], but we cannot be more destitute of measures for those qualities, than they would be of means for measuring time. It is the same with what we have obtained, though by means of equable motion, a distinct idea of successions of duration, equal in magnitude. We use this idea in the definition of motion, just as in geometry we consider the line before the surface, though we may never see the surface before the formation of a line, if we had not formed lines by the intersection of surfaces. We say, though we have no certainty, but we do not forget that many philosophers are of opinion that such ideas as those of internal motion are only fictions, resulting from our rational organization, and (if we do not mistake them) anterior to observation, or, at least, not derived from it. This question is here immaterial, as we suppose all parties ready to start with a definite notion of time. Considering the changes which at the same word the time. We it is apply the word, as we do terms of magnitude (see that word) to changes of the moral system, as in speaking of the motions and emotions of the mind.

When equal spaces are not described in equal times, we can imagine the rate of motion to change either gradually or discontinuously. Thus it can be imagined that a body which moves for three seconds should move at a time, if it is feet in a second, may at once, without any intermediate state, take a velocity of 20 feet. But such a conception cannot be realized on any material body, though there may be all the appearance of it. The rate of motion is changing perfectly gradually, there seems to be no direct method of obtaining the rate at any one instant, for no successive equal spaces are described in equal times. This difficulty will be discussed in the article VELOCITY: there the length of time is made so small that the change of rate undergone in passing through it is insensible, and to consider the point as moving uniformly through the length. Let the very small number of length be divided by a certain fraction \( f \) of a second, then \( s \) is the length which would be described in a time equal to \( f \) when moving at the same rate, since \( f \) is defined by the equation \( s = f \cdot t \) may be taken for the velocity.

The existence of motion is detected either by a change of the distance of an object, or of its direction, or both; but it is not necessarily the object which moves. The spectator himself may be in motion unconsciously, and it is matter of common experiment that every motion of the spectator which he is not conscious, and every rapid motion, whether it occurs consciously or not, will appear in motion. In walking, the effort necessary to maintain motion perpetually reminds us that it is ourselves who move; in a carriage, at an ordinary pace, we can always destroy the illusion of surrounding motions by a moment's thought. Just as in writing, we put our hand on the paper, when we change objects with the mind intent on other things, they soon take the motion of the carriage in a contrary direction. In the smooth motion of a boat, no effort of thought will enable the spectator to realize his motion, and destroy that of the shore or a neighbouring vessel. We state, which we find to happen to ourselves; perhaps the experience of other persons may be different. It may also happen that the object is in motion as well as the spectator, but we cannot always trace it back to the former, in the manner in which we shall describe. The whole motion of the object, compounded of
that which it has of its own, and that which it appears to have from the motion of the spectator, is called the apparent or relative motion.

The method of ascertaining the relative motion is as follows:—Since we only determine the positions of bodies by their distances and directions; and since we suppose the motions both of the spectator and the object to be given, let a fixed point be taken to represent the position in which the spectator imagines himself to remain, and laying down the real distances and directions of the object at the end of successive times, set off those distances from the fixed point in the proper directions. The relative positions of the object being thus secured, the line passing through these positions will be that in which the object appears to move. For instance, let the spectator move through 123…89 while the object moves through ABC…HI, so that when the first is at 1, the second is at A; when the first is at 2, the second is at B, and so on; the last positions being 9 and I. Take O for a fixed point, at which the spectator fancies himself to be, and having joined 1 and A, 2 and B, &c., draw OA parallel and equal to 1A, OB parallel and equal to 2B, &c., and 91 parallel and equal to 9I. Hence the spectator, fixed at O, will see the object successively at the same distances and in the same directions as a, b, &c., and t; whence the line abc…hti will be that of its apparent motion.

When both motions are rectilinear and uniform, the apparent motion may be more simply obtained, as follows:—Let the spectator move uniformly from O to A, while, in the same time, the object moves from B to C. Take the following method of fixing the spectator: as he moves forward from O to A let the paper on which the figure is drawn move backward in the direction contrary to OA, so that by the time the spectator has reached A, the point A shall have receded to where O was. He will therefore never have changed his place, his progression on the paper having been always compensated by the retrogression of the paper itself. Take CD parallel and equal to AO, whence the point C will, by the motion of the paper, at the end of the motion, be where D was at its beginning. Consequently the spectator, who imagines himself at rest, will give to B that motion which is compounded of a motion along BC, while through KL, M through Mn, and P through Pp. The motion of A has been transferred in a contrary direction to each of the other vessels.

When bodies are very distant their changes of distance are not soon perceived, consequently it is only by change of direction that their motion becomes visible. This is the case in all the heavenly bodies; but we shall now show what the apparent motion of a planet, superior and inferior, would be, if changes of distance, as well as direction, could be perceived and estimated.

If the spectator be in motion, an object at rest appears to him to have precisely his own motion, but in a contrary direction: for if the object be O and the spectator move through ABCD, no distances would be changed if the spectator were fixed at O, and the object moved through ABCD, and all directions would only undergo a diametrical change. Consequently the relative motion of the object is represented by allowing it to change places with the spectator, and inverting the direction of north and south, which will have the effect of making the relative motion from west to east, if that of the spectator were from east to west, and vice versa. Let us suppose now that the earth moves round the sun in a circle, which will be near enough for our present purpose; it will be immediately obvious that the direction of motion, so far as concerns the order in which the constellations will be described, is the same in the relative motion of the sun round the earth as in the absolute motion of the earth round the sun. For though the absolute directions of motion are opposite, yet S, to a spectator at E, is seen towards a point of the heavens opposite to that in which E appears from S. [Motion, Direction of]
In giving to the sun the apparent motion which answers to the real motion of the earth, the same motion must be given to the orbits in which the planets are carried round the sun. The question then is as follows: if a planet move round the sun, say with a uniform circular motion, while the sun moves round the earth, also uniformly and circularly, what path will the planet actually trace out?

To get a notion of the possible species of curves, let us simplify the question by supposing a circle ABCD moving along a straight line ET, while a point moves round the circle from A.

Fig. 6.

In the first place, if A did not move round at all, the line AG would be described; if A moved slowly round, the translation of the circle would cause an undulating curve like AKH to be described: if A moved as fast on the circle as the circle itself is moved forward, the undulation would be changed into a curve with cusps like ALG; while if A move faster on the circle than the circle is carried forward, the circle, so to speak, will not have time to get out of the way, and prevent the formation of loops, as in AMNMPQO. . . . The faster A moves, the larger and the nearer will be the loops, so that at length no one will be clear of the preceding and following, or the loops will intersect.

If the circle move round another circle, the same appearances will be presented in an inverse order. Let the centre E of the circle ABCD be carried round the circle ET, whose centre is O. If A did not move at all upon its circle, it would, by the motion of its circle, describe a circle (dotted) equal to ET: if A slowly moved, it would describe a succession of close loops enveloping O; if quicker, the loops would at last disengage themselves from each other; while still more rapid motion of A the loops would be

Fig. 7.

come cusps, and afterwards the curve would simply undulate. The character of these curves will be further discussed under TROCHOIDAL CURVES, and their astronomical application under PLANETARY MOTIONS. It is sufficient here to say that the apparent orbits of all the planets (or rather, the orbits as they would be if changes of distance were perceptible) are trochoidal curves of the above-described species, with loops which do not interfere with one another.

The composition of motion has been virtually proved in the preceding paragraphs, combined with the account of the second law of motion. [MOTION, LAWS OF.] If causes of motion act instantaneously, one of which would make a body describe AB uniformly, and the other AC, in the same time, we find in the second law of motion that the body will move so that its distance from AB at the end of any time, measured parallel to AC, is what it would have been if the cause of motion in the direction AB had never existed nor acted. Suppose, for example, that three-fifths of the whole time of motion from A to B has elapsed; take AD three-fifths of AC, and the body must be then somewhere in the line DE. Again, take AF three-fifths of AB, and by the same law it follows that the body must be in the line FG, that is, it must be at the point H, which simple geometry shows to be on the diagonal AK, and by three-fifths of that diagonal distant from A. The same may be shown for any other proportion of the whole time; consequently the body, impressed with the two motions, describes the diagonal AK uniformly, and in the same time as that in which the separate motions from A to B, or from A to C, would have been performed. This is precisely the course the body would have taken in space, if, while it moved from A to B on the paper, the paper itself had taken the motion AC; but the establishment of the latter assertion must not be confounded with the proof of the composition of velocities impressed on matter; the latter requires those considerations which lead to the second law of motion.

There are many uses of the word 'motion,' which are convenient, but require the introduction of arbitrary suppositions. Thus the moon never cuts the ecliptic twice running in the same place, and the intersection of her orbit with the ecliptic being called a node, it is said that the node moves; thus giving this node a sort of imaginary existence in the interval.

MOTION, DIRECTION OF. We have inserted this article, not for the sake of rectilinear, but of circular motions, the consideration of which is apt to cause some embarrassment to the beginner. In motion along a given right line there can be but two directions, in one or other of which the course must be; and these two directions are opposite to one another. But in circular or other rotary motion, all imaginable directions are taken in the course of a revolution, and whatever linear direction the moving body takes at any one point, it has the opposite direction at the opposite point. Still however there are two ways of moving on a circle: the motion may either be from C to A through B, or from A to C through B. These are called, somewhat improperly, different directions of motion.

Fig. 9.

If two bodies be moving over two circles, they are said to move in the same direction when, two radii being taken in the same direction, the linear directions of motion are the same, as BD and QR. Thus care must be taken not to compare two circular motions by positions which belong to radii in opposite directions. If, for instance, the directions of motion be ABC and QVS (which are the same), and if at the same time the two bodies be at B and S, their linear directions of motion are opposite, though according to the definition their circular motions are in the same direction. Thus in the case of the moon, and her revolution round her own axis [Moon], the middle point of the visible moon is moving round the moon's axis in a direction opposite to the orbital motion of the moon; but the radius of that middle point is opposite in direction to the line joining the centres of the earth and moon; so that the direction of revolution of the moon's rotation is the same as that of the orbital rotation.

MOTION, LAWS OF. The laws of motion mean those universal methods of receiving and losing motion which close attention to mechanical phenomena, coupled with
strict inductive reasoning, has shown to be inherent in the constitution of matter.

The intelligent observer, not used to inductive reasoning, nor instructed in the results of mechanics, were required to state the views which experience had taught him of the constitution of matter, as an agent or patient in the present state of the earth, and at the pole an object of considerable one. The points near the pole, all the motions considered, are very small, the trochoidal orbit (p. 450), the undulations of which are small, and the rotational velocity small; those near the equator make larger undulations, with greater velocity of rotation. By means of the example of the earth some modification of general laws would be observed, arising from the difference of the motions of the several places. It would not surprise a person wholly unacquainted with mechanics, to whom the preceding facts were stated for the first time, if he were told that some mistakes were made in the pointing of guns in our Indian battles, arising from the artillerymen having been trained by officers who had learnt their art in the latitude of Addiscombe, near Croydon, in Surrey, and had forgotten to allow for the difference in the diurnal motion of the two countries. Now the first law of motion which we can establish (though usually called the second) arises from it never having been observed that any notice need be taken of the undulations of the earth in estimating effects of motion. It is not found necessary to introduce the canon-pieces on gunnery for different latitudes, nor to alter the disposition of parts in any machine moved from one latitude to another to produce a more advantageous effect. There is no question in that case, as in the case of a cannon-ball, which are carried toward the equator, and [CENTRIFUGAL FORCE; PENDULUM] the results of this are apparent in experiments in which the acquisition of motion depends upon weight, or rather, upon its proportion to the quantity of matter. But this very principle which, in the case of the motion of the earth, is the question of the truth of the laws of motion is established by a test which would detect the smallest quantities, and furnishes an answer to those who might say that the possible effects of the difference of diurnal motions, though not distinguishable in such cases, as they are carried toward the equator, and as a cannon-ball, might be perceptible in delicate instruments.

If to the motion of the earth we superadd another, such as the motion of a carriage, the same sort of result is found. Those who move on a railroad at the rate of 30 miles an hour, or 45 feet in a second, do not find the relation in which they stand to the objects in the carriage in any degree changed by the motion. At the instant of taking the motion, or on any sudden jolt or change of motion, effects may be produced, which are reduced to what is seen in the case of a speed once obtained, it is well known that a person might occupy himself in reading a work on mechanics written on terra firma (so called), and might verify all the experimental conclusions, without coming to any result which would remind him of the different treatment of the writer and himself, as to motion. Hence we are led to the conclusion that all the relations of matter to matter remain unaltered, if the whole system be made to move, provided that the same motion be communicated to all its parts. And though we do not, absolutely speaking, know what rest is, since no point of the earth, nor of any heavenly body, can be shown to be at rest, yet since we see that the relations remain unaltered when the velocity of a whole system is changed, we are led to conclude that the same laws which prevail when all the parts of a system have the same motion, would also prevail if the whole system were at rest; the ground of our presumption being, that the laws remain unaltered under any alteration of the common motion which it is in our power to impart to a whole system in motion.

Let us now suppose that the carriage, instead of moving in a right line, is carried on a curved road, say a simple circle. It is no longer observed that loose objects in the carriage have a tendency to repose relatively to the carriage whenever they are not in its natural state. If the movement of the substances on which they stand be sufficiently small, they will endeavour to move outwards, or from the centre of the circle of motion. This phenomenon can be made the law of motion, when the latter case be considered, and at present enter into this subject further than to point out that it is only of restfuline produces we can predicate any law as descriptive of what is inherent in matter. We have, it is true, already spoken of circular motions in taking into account

2 M S.
those of the earth; but it must be remembered, firstly, that the circles in question are so large, that a small arc of any one is nearly a straight line; secondly, that we have been obliged to advert to this tendency outwards, which is the reason of the diminution of weight (or of much the greater part of it) detected from the oscillations of a pendulum when it is moved at right angles to the equator.

This second law of motion (for such it is called, though it must be deduced first when the earth's motion is considered) may be thus stated:—If there be two or more causes of motion, taking place at two different times in two different directions, the effect in the body or external to it, its effects do not interfere, nor does either diminish or augment the effect of the other. If, for instance, the body A be subject to two actions, one of which, being entirely in the direction AB, would bring the body to B in a given time, and the other, entirely in the direction AC, would bring it to C in the same given time; then the body will move from A to D, precisely as it would have done if, moving along AB in the first specified, the line AB had been translated with its extremity, or, in the second manner specified, the line AC not changing its direction.

The most simple and general method of stating this law is as follows:—The distance of a point from a straight line or plane, measured in any given direction, and as it will be by definition a number, is called the distance from the said line or plane; and if it be compounded, during that time, of any causes of motion, provided they act in the direction of, or parallel to, that straight line or plane; or if no force, in a given direction, can produce motion to or from a line in that direction. Thus if a ball were thrown up in such a manner that it would move 50 feet in one second, no imaginable horizontal current or whirlwind, however much it might alter the actual course of the ball, would prevent its rising 50 feet in the second.

The statement of the law by Newton, namely, that when a force acts upon a body in motion, the change of motion which it produces is in the direction and proportional to the magnitude of the force which acts, is perhaps rather too vague to give a distinct notion to learners.

From the law just enunciated, we may learn that bodies upon the earth, moving with the earth, have the properties of bodies at rest with respect to all motions that are to be estimated relatively to the earth: at least upon the supposition that the curvature of the motions of the earth is not sufficiently rapid to be sensible. But Newton himself did not inquire what is the natural state of matter on the earth? Can it preserve any notion of itself, or does every motion gradually slacken and die out, by the mere incapacity of matter to maintain it without the application of external causes? On this point we have no further reason to assert than that it would be by themselves insufficient. Our first step would be to conclude, from what we actually see, that rest is the natural state of matter, and one to which it always approaches, however great a cause of motion be applied, unless that external cause, or some part of it, be maintained.

On looking further however we find that terrestrial matter, immediately on its being put in motion, encounters causes of retardation. The weight of the air, and the friction of the particles, in the substance with which the body is made, are easily able to lessen the motion of bodies which encounter them. The more nearly these are removed, the longer does motion continue. It is certain then that these resistances contribute in a great degree to the destruction of motion; but it is also certain, that its immediate rapid motion, and also that it is in no case unresisted.

If we grant that a perfectly smooth ball, lying upon an indefinitely extended plane without friction, and not in contact with any atmosphere, would move for a long time without any sensible diminution of the rate with which it was made to set out, we grant quite enough to explain all that we see, without the necessity of supposing that the motion would continue for ever. How then can we establish the first law of motion (so called), which is thus stated, that matter will retain its state of rest, or of motion, for any length of time, however great, until acted upon by some external cause? We must here appeal to the results of the application of this law, which have never, in any instance, exhibited any reason to suspect that it is only approximately true. Throughout the long period of historical astronomy, no one of the heavenly bodies has shown any diminution of its motion, or any of the consequences which it is found to be necessary to assume, if we would explain its tendency to wear itself out. We shall not here go into the details of these consequences; the conclusion is, that the state which matter, independently of external bodies, has been created capable of maintaining, is not such that motion is in any case certain to cease, but that there is no more tendency of itself to part with any of its velocity, nor to move slower or faster than it was first made to move, than it has to set itself from rest into motion. A great many, perhaps most, of the results derived from such a hypothesis as that of the Newtonian theory of attraction, have arisen from want of proper conception of the neutral state of matter. Maintenance of velocity and direction has been to them a proof of the existence of external causes maintained in action; whereas it proves nothing but that the philosophic speculator, or other an external cause which acted for a longer or shorter time: the external cause stops in when the velocity changes, or the direction, or both, and not till then.

Properly considered, the immense number of different states which matter may retain, or which it may lose absolute rest, or any degree of velocity whatsoever, is as wonderful and mysterious a law as that of the attraction of matter upon matter, without any apparent intermediate agent. That matter retains, whatever be the rate of motion and one direction until acted on from without, is as difficult to admit, as that the mere presence of other matter should change that motion and that direction. What should teach blind atoms to draw straight lines, and not wander in circles, and to maintain their fundamental conceptions, according to some, or the powers of perception and inference, according to others, by which reasoning minds know or discover the simplicity of a straight line?

These consequences of observation, namely, the law of its existence, by which matter can retain certain states, if no other matter interfere, and by which it can change the state of other matter, its own at the same time undergoing another change, should never be allowed to appear to be the result of any philosophical speculations (for no religious question need be allowed to enter), whose system introduces no difficulty into the details of mechanical philosophy which did not enter into its principles. The first consists of the two ideas of the creation to be the consequence of the same power as that which first created, and who consider that one moment's cessation of a sustaining power, of the same quality, so to speak, as the creative, would be the annihilation of all things. The second, that of course find no more difficulty in the maintenance of the universe than in its first construction. But a great confusion of ideas is introduced into all fundamental questions which relate to matter, by the existence of a sect which we call the empiricists, in which the triple forces of the elements, to whom we may call believers in the Creator and not the Maintainer. These, whatever they may think of the God of the moral world, imagine that the God of the material became inactive and quiescent as soon as matter was created, and endowed with certain properties or made subject to certain laws. These laws, which are really their minor deities, carry on the business of the universe, and they can absolve the idea of God altogether from the continuance of the physical world. Among them may be found many of the literal interpreters of the Mosaic account [Motion of the Earth], who hold strictly that the Creator 'rested from his work,' and left matter to its 'laws,' except on certain rare interpositions, and endowed with certain properties or made subject to certain laws. These laws, which are really their minor deities, carry on the business of the universe, and they can absolve the idea of God altogether from the continuance of the physical world. Among them may be found many of the literal interpreters of the Mosaic account [Motion of the Earth], who hold strictly that the Creator 'rested from his work,' and left matter to its 'laws,' except on certain rare interpositions, and endowed with certain properties or made subject to certain laws. Among them may be found many of the literal interpreters of the Mosaic account [Motion of the Earth], who hold strictly that the Creator 'rested from his work,' and left matter to its 'laws,' except on certain rare interpositions, and endowed with certain properties or made subject to certain laws.
of the most singular mental aberrations which ever he manifests, that at the time of the appearance of the Newt’s not seen, and that he was not considered the maintainer of the creation, at least until (which has not yet happened) some good quiescent second cause was discovered—that doctrine was frequently charged with atheism. It is pretty obvious (though not obliged to do so) begin from matter at rest, and establish first that law of motion which usually stands first.

The third law of motion was enunciated by Newton as follows: to every action there is an equal and contrary

which requires a definition, and this definition will require the statement of the principle, or something amounting to it, in a more definite form. We may readily suppose that when matter communicates to other matter motion which the latter had not before, the former must lose some of its own. On any other supposition, the connexion of matter with other matter would create motion. But this it would seem to do in the case of attraction, so that the privad force objection to the supposition of matter creating motion seems to be answered by an instance; but however the observer that in every case of nature, the creation of motion by attraction is accompanied by the creation of an opposite motion. If a magnetic and non-magnetic needle be placed in water, not only will the magnetic needle move towards the other needle, but it will remain there, and appears then that opposite motions are to be considered as contrary effects; and, if applied to the same body, we know that they would destroy one another. In like manner, then, as the creation of momentum may be considered as a law that maintenance of uniform velocity must be looked at as inherent in matter, and as not arising from external causes; so in the third we are taught to consider opposite velocities as negations each of the other—so that the creation of both is equivalent to the creation of neither, and not, as might be supposed, requiring two new and distinct causes of motion. In like manner, if A were to lend a sum to B, which C was to stand engaged to repay, a credit and a debit would be created which did not exist before, the whole state of the money being altered.

The most essential part of the principle however is derived from observation of the fact that, ceteris paribus, the more matter is moved, the more slowly is it moved. If the magnetic and non-magnetic needles be of equal mass, they will at the end of any time have equal and contrary velocities; but if the magnet be double of the other, it will in the same time acquire only half the velocity. In fact, confidently as we feel entitled to expect that, in some sense or other, action and reaction will be found throughout nature, the true meaning of the word action as long as we think only of velocity, and not of the quantity of matter in which velocity is created. A cause of motion once existing, and which was entirely expended in giving a velocity of a second to a body of 1000 pounds of weight, would have given 200 feet per second to a ball of one pound weight. Hence it is Momentum which is the measure of the action of matter upon matter, and the definite enunciation of the third law is as follows:—Whenever any matter gains momentum in one direction, other matter either loses as much momentum in that direction, or gains as much in the contrary direction. Action then is creation or destruction of momentum; reaction is destruction or creation: while the destruction of momentum in the one direction, and its creation in the contrary direction, are equivalent effects.

The absolute strictness of this law, probable as it is rendered by terrestrial observations, is proved in the same way as that of the others, namely, by the observation of the consequences of deductions which are impossible otherwise. But the law being once admitted, its necessary consequences may be carried to a point startling to those readers who are not accustomed to consider any degree of minute motion which is unperceivable by the senses. See remarks in Astronomy, vol. iii., p. 68.) Thus, who can comprehend that, if the law of attraction be true, a particle of snuff in a terrestrial snuff-box does its part (though but a small one) towards the maintenance of the motions of the solar system by its attraction of the particles in a Saturnian snuff-box (if the inhabitants of that planet be allowed such a luxury), will be able to comprehend that the earth itself feels (how slightly, we need not say) every motion which is made upon it. When Archimedes only wanted a point to rest his lever upon, in order to move the world, he little thought that his end could be gained by walking upon its surface, and that he could thereby have shown himself the maintainer of his new method of detecting the goldsmith’s fraud. In walking forward upon the earth, which friction enables us to do, our feet are, and what is that velocity of one mechanism in the direction, remains always the same, at least unless there be somewhere in the universe matter which obeys other laws than those of our system.

The three laws of motion, then, may be thus enunciated:

1. Matter, unacted on by other matter, preserves the state which it had when action last ceased, that is to say, remains at rest, if it were then at rest, or if it were then moving, continues to move with the same velocity, and in the same direction. Rest, or uniformity of direction and velocity, can be maintained without the continuance of external action.

2. All force, or cause of motion, in any direction, produces its effect in that direction, and in no other; that is, the destruction of an equal momentum in the direction of the given force, is, at the end of a given time, is unaffected by forces, whatever they may be, which act in that line or parallel to it.

3. Action of matter upon matter is evidenced by the creation of an equal momentum in the opposite direction: and action is always accompanied by equal and contrary reaction; that is, momentum is never created in any one direction, without a loss of the same momentum in that direction, or the creation of an equal momentum in the opposite direction.

Professor Whewell (to whose 'First Principles of Mechanics,' Deighton, Cambridge, 1832, we should particularly refer the reader, observing that the French writers are remarkably vague and indistinct in their treatment of the same fundamental idea) has, in the same volume, page 238, added another definition: 'Momentum is the time for which a body possesses the property of the velocity of one mechanism in the direction of that mechanism.' He defined momentum of one body by another as 'that quantity of motion which a body already possesses is not either of them causes which change the acceleration produced.' He concluded that there is a necessary and empirical part in each, as follows:

Necessary.

1. Velocity does not change without a cause.

2. The acceleration quantity of a force is measured by the acceleration produced.

3. Reaction is equal and opposite to action.

Empirical.

The time for which a body has already been in motion is not a cause of it; the velocity and direction of the motion which a body already possesses are not either of them causes which change the acceleration produced.

From the preceding it will appear that the necessary part of each law is either a verbal proposition or disputable. To say that velocity does not change without a cause, is a reference to that permanent association of change with reason for change which habit derived from experience, if nothing else, would lead us to make in all cases, whether concerning motion or anything else: the law of matter is found in the empirical part. Again, the accelerating quantity of a force can mean nothing but the acceleration produced; for our only meaning of force is cause of motion or alteration of motion, and it is an identical proposition that the accelerating quantity of a cause of acceleration is measured by the acceleration produced. Thirdly, if in 'reaction is equal and opposite to action' we are to understand by action the production or alteration of Momentum (\(M \times V\)), we do not
see the necessity of the proposition: while if it be merely understood that there is a somewhat which matter cannot give to other matter without itself losing the same, we may, as in the case of the presumed necessary part of the first law, deny that it is any peculiar property of matter which is stated. It is the mode of measuring this somewhat which makes this law have a specific meaning with reference to matter.

The mistakes into which philosophers fall upon the laws of motion are uninteresting except in the applications which we are to determine, and in the conclusions which men of science will draw from them. The earth will be found enough of these to give an idea of the difficulties which such fallacies placed in the way of the sound knowledge of the laws of Galilean. A full account of the labours of Galilean is accessible to all in the life of that great man, published in the Principia. But the mistakers of Descartes on the same subject, see Vortices.

The first distinct enunciation of these laws appears in the Principia of Newton, since whose time they have been usually quoted in their present form and number.

Though all mechanical problems admit of solution upon the assumption of these laws, in conjunction with those which may be called the distinctive properties of the solid, fluid, and gaseous states, yet the purposes of mechanical inquiry are not to be attained generally. Having deduced from them, the proper conception of which can only be made by mathematicians, and are therefore referred to a purely mathematical article [Virtual Velocities]; see also Pressure, Force, Inertia, Centripetal and Centrifugal Forces, and Velocity. See particularly the article Inertia, for the reason of the non-introduction of that word.

Among the many absurdities which have arisen out of a misapprehension of the laws of motion, is the attempt to distinguish what is, as a perpetual motion, a motion of which itself would never stop. The earth and planets are such machines in their rotations on their axes; and we have seen that any particle of matter, unacted on by other matter, and once in motion, is a perpetual motion. In which state, if a wheel be continued to rotate, it will be deprived of friction on the pivots, and enclosed in a permanently air-tight and perfectly exhausted receiver, it would, when once in motion, be a perpetual motion. But as long as any friction or resistance, however small, is perpetually retarding the motion, it is obvious that the velocity, if maintained, must be indebted to some external supply of moving power. To take the case of friction, which arises from the roughness of the supports, and which, independently of adhesion, must have a rapid augment in the amount by the roughnesses of the one surface strike upon those of the other, and communicate a portion of momentum to the frame, and finally to the earth: to suppose that a wheel as above described should go on for ever, and yet be such that there would be no action without reaction. In fact, a perpetual motion, such as is intended to be made by the speculators on the subject, is nothing less than a machine which will work for ever without new moving parts, just as the gnat bit less absurd to suppose that it would perpetually overcome friction and atmospheric resistance, than that it would continue to supply the impetus necessary to carry on the saving of a plank or the weaving of lace.

MOTION OF THE EARTH. The theory of gravitation has placed this question on a footing entirely different from that on which it was argued, whether by Aristotelians or Copernicans. Both of the latter parties supposed the existence of a fixed central body something on which the bodies of the solar system move; the earth, and the second the sun. This centr um mundi, or centre of the universe, is exploded, and with it all the systems, whether Ptolemaic or Copernican, which preceded the discoveries of Newton. But as already noticed in Copernicus, the existing system preserves the name of that great man; the reason being, that its distinctive peculiarity is retained relatively, if not absolutely, namely, that the planets all move round the sun, or round a point near to the sun. But it is added to the real Copernican system, that the sun, planet, and all, may be, and probably are, in motion; the translation, as it is called, of the whole system being very nearly rectilinear, and the curvature, if any, arising from the attraction of the fixed stars. Nothing but a long course of observation can settle this question.

In approaching the old controversy on the motion of the earth, we confine ourselves rather to the arguments by which it was opposed than to those by which it was supported. For this we have two reasons: firstly, that the former are well known and extensively circulated, while the former, unless preserved in historical articles, will find the publication of the old controversy; secondly, that the controversies of the present day may be usefully illustrated by recurring to the long-dead struggle between the Copernicans and their opponents. We have now among us those who would assert all new truths by the force of a revolution, and at the same time, quietly acquiesces in the defeat which their own principle formerly received. The charges still brought against the cultivators of the sciences, to the distress and disgust of every well-constituted mind, as Sir J. Herschel expresses it, is much to be deplored; about which much has been said, or an alarm newly awakened by the circumstances of the present day, but as the effects of an abiding spirit, who has always opposed investigation, and which, if it had prevailed, would have smothered all the knowledge of nature which has been acquired in the last two centuries. If some of those who have constituted themselves successors of the cardinals who forced Galilean to recant, have learnt from the past history of their own cause, and from the present temper of the world, to act with a much more subdued system less openly than it appeared in the seventeenth century, the compliment which they thus pay to the advancing intelligence of mankind, though received with thanks and highly appreciated, should not be accepted as an equivalent justification for the charge that the system which may be now in process of being seized upon to place the great question of Revelation upon a false basis. The case of those who now endeavour to impede the progress of geology is much like his fundamental points to that of the former labourers to the same effect in the field of astronomy. It has even been said that a reproduction of some passages of the latter will perhaps enable our readers to help themselves in forming their opinion of the former.

When the work of Copernicus appeared in 1543, it seems to have been but a step towards the system of an astronomer or a mathematician, of some sort of the latter; but we will perhaps enable our readers to help themselves in forming their opinion of the former. When the work of Copernicus appeared in 1543, it seems to have been but a step towards the system of an astronomer or a mathematician, of some sort of the latter; but we will perhaps enable our readers to help themselves in forming their opinion of the former. When the work of Copernicus appeared in 1543, it seems to have been but a step towards the system of an astronomer or a mathematician, of some sort of the latter; but we will perhaps enable our readers to help themselves in forming their opinion of the former. When the work of Copernicus appeared in 1543, it seems to have been but a step towards the system of an astronomer or a mathematician, of some sort of the latter; but we will perhaps enable our readers to help themselves in forming their opinion of the former. When the work of Copernicus appeared in 1543, it seems to have been but a step towards the system of an astronomer or a mathematician, of some sort of the latter; but we will perhaps enable our readers to help themselves in forming their opinion of the former. When the work of Copernicus appeared in 1543, it seems to have been but a step towards the system of an astronomer or a mathematician, of some sort of the latter; but we will perhaps enable our readers to help themselves in forming their opinion of the former.
and only repeated his own mode of treating Moses, Isaiah, and the writer of Job. But it would have been better to have argued by analogy, that if either of the latter had written a profoundly philosophical work, he might, whatever appeal to these sidetracks from his religious writings, have admitted the motion of the earth.

Copernicus had no predecessor as a mathematical reasoner upon the question. The first continental followers of the new system were Rheticus, Reinhold, Mazzinius the instrument of modern times for the direct education of the new instructor of Galileo. In 1556 appeared in England the "Castle of Knowledge," by Recorde [Recorde, Robert], in which a cautious and implied avowal of Copernican principles is made, and also the Epheusus [Ephesus], John Field, an essay which may be included in the philosophical (or metaphysical) in propounding a theory which contradicts it; but there can be none in stating the results which follow from actual investigation: the thoughts of the mind of man may contradict revealed science (if there be such), but the author of the God of nature can hardly detect falsehood in the God of revelation. It was Copernicus then, and not Galileo, who was the heretic, if heresy there were in the case; but the former and his immediate disciples slept in peace, and the latter was made to sign a stipulation that the doctrine of Galileo is so well known, from the party use which has been made of it amongst us, as well as from the excellent account of Mr. Drinkwater (Bothune) in the 'Library of Useful Knowledge,' that it is unnecessary to go into details. This at least, the Roman Catholic Church is not inclined to beware of bringing its infallibility to the practical test of a declaration in philosophy. We say the Roman church, for though admitting that the seven inquisitors who signed the indictment against Galileo are not to be regarded, upon the same ground as a final judgment, as a sentence of condemnation, the Catholic and the Roman Church is not inclined to be so foolish as to take a notion of the doctrine of the earth in the way the prophecies of Galileo would be some in the judgment of the doctrine of the earth's motion was left by the process; their declaration at the commencement of the third book of their edition of Newton (1742), runs as follows: 'Newton in this third book assumes the hypothesis of the motion of the earth. The principles or hypotheses cannot be explained otherwise than by making the same hypothesis. Hence we have been obliged to put on a character not our own.' (Hinc silens est cumus sumus gerere personam.) But we profess obedience to the decrees of the Holy Roman Church, in so far as is consistent with our faith in the Holy Scriptures as the sole rule and final authority for all Christian teaching and life. At the same time, with reference to the reproaches heaped upon the whole body of Roman Catholics for this persecution of Galileo, we heartily wish that all persecutions, as well as all other inequalities, are not the ground of excitement, but the generality of the Church of which we are the members. We believe that the tribunal was one of which Galileo himself admitted the jurisdiction, and supposing the inquisitors to have believed them to be doing their duty, any such multitude of such a nature is the same respect of persons (for Galileo had powerful friends). For ourselves, we would as soon have been among the inquisitors as in the position of Galileo himself, if it be true that, on rising from his knees, after taking the most solemn oaths that he 'abjured, cursed, and detested' the doctrine of the motion of the earth, he repeated aside to a friend, 'E pur si muove' ('It does move, for all that'). We may pity, but cannot admire, either party. Not to leave unsaid any palliative on either side, we may state that the exclamation of Galileo on that occasion proceeded from a sense of guilt and a feeling of shame at the creature of respect of persons (for Galileo had powerful friends). For ourselves, we would as soon have been among the inquisitors as in the position of Galileo himself, if it be true that, on rising from his knees, after taking the most solemn oaths that he 'abjured, cursed, and detested' the doctrine of the motion of the earth, he repeated aside to a friend, 'E pur si muove' ('It does move, for all that'). We may pity, but cannot admire, either party. Not to leave unsaid any palliative on either side, we may state that the exclamation of Galileo on that occasion proceeded from a sense of guilt and a feeling of shame at the
pressed only in Latin. The question just discussed was settled June 22, 1633, but this was not the beginning of the controversy. The following list of writings will save future reference. They are headed by their dates:—1614, Scheiner, "Disq. Math. de contr. et novitiat. Astrom."; 1615, Francisci, "De motu terreum," 1619, Bising, "Disq. de quod. telluris revol."; 1616-1622, Kepler, "Epit. Astron. Copern."; 1619, Lansberg (Philip), "Comm. in motum tempestatis luminae," 1619, Ursinus, "De motu et auctoritate corpor. sol et eccidit, et ad locum suas reverit, itaque r".

Joshua, x. 12: "... Sun, stand thou still upon Gibeon, and thou, moon, in the valley of Ajalon. And the sun stood still, and the moon stopped, till the avengers of the Lord had avenged the people of Judah." Iastath, xxxviii. 8: "... So the sun returned ten degrees, by which degrees it went down." "... Which shaketh the earth out of her place, and the pillars thereof tremble: which commandeth the sun, and it riseth not; and sealeth up the stars." Of the Son of man: "... Who laid the foundations of the earth?... Whereupon are the foundations thereof fastened? or who laid the corner-stone thereof?... Where is the way where light doth dwell? and is for darkness, where is the place thereof?... Job, ix. 6, and the following, Psalm xviii. 4, 5, 6: "... In them hast he set a tabernacle for the sun, which is as a bridegroom coming out of his chamber, and rejoiceth as a strong man to run a race. His going forth is from the end of the heavens, and his circuit to the ends of it. And there is none which can stay him..." Ecclesiastes i. 4, &c.: "... One generation passeth away, and another generation cometh; but the earth abideth for ever." Sun also ariseth, and the sun goeth down, and hasteth to his place whence he rose. The wind goeth towards the south, and turneth about unto the north. Is the Vulgate, the last sentence refers to the Sun. Or sol et occidit, et ad locum suum reverit, itaque rem. rec. g voter, et fecit stur ad aquilorum."
others to the same purport. Also Psalm lxxv. 3: 'The earth and all the inhabitants thereof are dissolved: I bear up the pillars of it.' He adds all the places in which 'heaven above' and 'earth beneath' are mentioned.

The Copernicans, besides the very few passages which they employed at the same rate, consequently, maintains, that only an unusual one), brought forward texts in which admitted errors exist; such as the Mosaic definition of the firmament, the circumference of Solomon's brazen sea (though its diameter being ten cubits, must have been upwards of that size since the description is in general accuracy, or the word 'in the midst of' itself, or the word 'was', or the word 'which' itself, which is an obvious literal sense of the Scripture is to be taken, except where it is manifestly false; that Archimedes had shown the proportion of ten to thirty to be false, but that no one had actually shown the earth to move. This was evidently contrary to the opinion of those who opposed the thing in question, and could not be proved false by assuming a literal interpretation, which, it was admitted, might be rejected if the earth's motion were true.

Upon a review of the passages cited, it is clear enough that there is no reference to the earth's motion without number, but that number is that of an immovable earth and a movable sun; while if there be no astronomical system, it follows that vulgar notions are adopted in the modes of expression, which represent appearances without reference to their truth or falsity. The same course (which the Church of Rome, and all modern Urbanists must be content to abide: will they go back to Ptolemy, or forward with the advance of science? Can they show any reason why the astronomical system of the Old Testament should be rejected, and those passages which are really true, that, if the earth move, the head of a man leaves farther than his feet; that rest is nobler than motion, and ought therefore to belong to the sun, the nobler body: answer, that for the same reason the moon and all the planets ought to rest; that the lamp of the world must be greater than the lamp of the sun; answer, that a lamp frequently hung up from a roof to enlighten the floor; that there is a cause of motion (magnetism) in the earth: answer, that Copernicans have examined the sun, or they might perhaps have found as good causes of motion as those that the Copernicans have found. Yet the earth has a root which signifies motion— which on the other side was contended to apply to the motion of animals upon its surface.

Such were the more common arguments of the Copernicans; others are mentioned in 'Old Arguments against the Motion of the Earth,' in The Companion to the Almanac for 1836. We do not charge every one, either of the Ptolemaists or Copernicans, with all the absurdities above noted; but we have not found one of either which is free from the defects of the other.

The declining days of what was called the Aristotelian philosophy had their span much shortened by the glaring light into which it was thrown when held up against the results of the philosophy of Galileo; and this not more by the arguments advanced in support of the old system than for being forged in the philosophical workshops of the age we have been considering.

The physical arguments of the time consisted much in supposing inclinations, propensities, and almost feelings of pride and enmity, in the vain effort of all one and all. A comet, says Fromond, is 'not such an obscure ace of the planets that nature should have manufactured a sphere and a heaven for it to revolve in; and the proper pride of a comet was the sufficient reason for one motion rather than another. These arguments follow, and they may be condensed as follows. Aristotle and Ptolemy assert it; the Scriptures assert it (Fienus puts them second); the heavenly bodies are made for man, and the servant comes to his master, not the master to the servant; the natural motion of earthly bodies (as when falling) is in a right line; a body cannot have two natural motions, therefore the earth cannot move in a circle; if the earth moved, an arrow shot upwards could not fall on the spot from whence it was shot; the air, differing from the earth in substance, cannot be moved at the same rate, consequently, maintains, that &c., would produce a wind if the earth moved: a stone let fall from a height would not fall directly under the point which it leaves; an arrow shot towards the east would go much farther than shot towards the west, the first having the air with it, the second against it; &c., &c.

The Copernicans contended generally for the greater simplicity of their system, and the incredibility of the enormous velocity which the sphere of the fixed stars must have if the Ptolemaic hypothesis were true: to which it was answered, that God 'doeth great things past finding out, and wonders whereby he showeth his wisdom in both the most winding and most without motion, whereas the heavens are incorruptible: answer—that wind, &c. give sufficient motion; that the most moveable part of man is underneath, since he walks with his feet; whence the most unworthy part of the universe is the last to receive a motion: answer: that the Copernicans were absurd (as in fact they were) for taking the earth out of the centre of the universe upon an argument the force of which was derived from its being in the centre (or lower part); also, which is theoretically true, that, if the earth move, the head of a man leaves farther than his feet; that rest is nobler than motion, and ought therefore to belong to the sun, the nobler body: answer, that for the same reason the moon and all the planets ought to rest; that the lamp of the world must be greater than the lamp of the sun: answer, that a lamp frequently hung up from a roof to enlighten the floor; that there is a cause of motion (magnetism) in the earth: answer, that Copernicans have examined the sun, or they might perhaps have found as good causes of motion as those that the Copernicans have found. Yet the earth has a root which signifies motion— which on the other side was contended to apply to the motion of animals upon its surface.

* This worthy, to a great capacity for foundrout deduction, added the power of an astronomer, and some art in extracting himself from the service of an unfounded prophecy. When Gessaendt remained alive after the time which Motte had positively fixed for his demise, the latter pretended that the non-fulfilment of the prophecy was in consequence of the warning which it gave Gessaendt, which health was declining, to try change of air.
MO T 458  MO T and Kepler with celestial. The time came when even divines might insist on this simplicity of motion in illustration of the wisdom of the architect. But the structure of the earth had not been examined; consequently when the conception of a geocentric universe began to appear, the method was ready, the texts were forthcoming, neither was interpretation wanting, nor those who would raise an outcry against the results of examination and the investigators, because the former would not agree with the interpretation of the passages. The same course will be run, with the exception only that the enemies of free inquiry and honest statement are not so numerous nor so powerful as in the seventeenth century, so that the effect will be less, both in extent and duration. So very slight have been the scientific attainments of the opposing party on this occasion, that it becomes those who are interested in the history of the sciences to take some measures for the preservation of their writings, since it is found that the purely theological works against the motion of the earth is extremely scarce, while only those which unite a point of science, such as it was, with theology, are now* in any degree diffused.

If we throw away all the arguments which would now be considered fantastic, we shall find the sense of both sides of the Copernicans rested within the limits of the strength of the Copernicans lay in the simplicity with which they exhibited the celestial motions; that of their opponents, in the then unanswerable argument of the throwing up of a stone. Both parties believed that the stone itself would have a motion of its own, at least such was the opinion until the Galilean philosophy was fully received. Fromond shows his penetration when he says that the Copernican philosophy will finally be wrecked on this argument; had he admitted an alternative, and assumed either the rotation of the moon, or the motion of the earth, or the motion of the earth would lead to an entire change in the principles of mechanical philosophy, no one would now have disagreed with him.

We shall close this article with a mention of the actual proof that the earth is at rest.

1. It is difficult to believe, in the present state of mechanical knowledge, that any heavenly body is at rest, and the burden of proof must lie upon those who assert rest, and not upon those who believe in motion, which a person instructed in mechanics must do, until the contrary is proved.

2. If a motion existed, a centrifugal force would arise, which would produce an effect on the oscillation of a pendulum in different places of the earth. [Galilei, Discorsi, II. 6. F.ixa; Pasquali, Comment. Such an effect is found to be produced corresponding to that which should be produced by the earth's rotation; nor have those who deny that rotation ever produced any explanation of the phenomenon.

An experience has been tried, but will be worth while to describe, and which Delambre says had 'a sort of success.' When we say that a stone let fall from the top of a high tower should fall precisely under the point from which it started, we say that which ought not to be perfectly true; the reason is as follows: The starting point of the stone, being at a greater distance from the centre than the point directly under on the earth, describes somewhat a larger circle, and moves a little quicker. The stone therefore at the commencement of its fall has a motion from which would move rapidly the point directly on the earth. The resistance of the air, though it exists with respect to the fall of the stone, does not exist with respect to the motion from west to east, since the air, earth, and stone are carried together; consequently the stone should fall a little to the left of the foot of the tower. This experiment was tried at Bologna by Guglielmini, who published his results in a work called 'De Motu Terrae diurno,' Bologna, 1792; it was repeated at Hamburg: the heights were respectively 241 and 235 feet (French).

A high, perfectly pointed body fell a fraction of an inch to the east, and never to the west of the point directly under the point of projection. Had this departure been an accidental effect, it is incredible that it should always have taken place in one direction. Delambre does not say that the experiments made; but if they were only six, and if the chances of departure east or west had been equal, it would have been 63 to 1 against the departure being always in one direction. In the last two proofs we are made to perceive the earth's rotation, by phenomena which can be explained on no other hypothesis that is worth consideration.

4. We perceive the earth's orbital motion only in the phenomenon of aberration, from which one of two things must be true; either the earth moves round the sun, or light does not move in a straight line; and what is more, the light from a star, in whatever part of the heavens it may be found, changes its course with the position of the sun. The change, it is true, is minute, but it is as well established as it would be if it were visible to the naked eye; it must be remembered that twenty seconds is as a small quantity to the eye as a penny is to an instrument capable of measuring one second. Were there no other phenomenon by which to test it, the orbital motion would be conclusively proved by that in question.

The next argument, though not per

fectly conclusive, lends a great additional force to the rest. The planets all exhibit motion round the sun: this can be proved; and the only question that remains is, whether the sun moves round the earth, carrying the earth with him, or whether the earth and the stars are moving round the sun. The planets also, in most cases, revolve round axes visibly, and there is no proof that any one does not.

5. The last argument is authority, properly used. There are many arguments of authority subject to decide even between Newton and the worthy Frenchman, whose name it is unnecessary to mention, who thinks he proves the planets to be reflections of the sun upon the polar sea and the southern hemisphere of stars to be a reflection of the northern sea. We are not competent to decide, for we are placed we do not exactly know. With such persons authority must decide, if there be any decision at all in their minds; and it is of some importance to them to know what sort of authority they trust to. The argument from authority would be the same as that before given; 1. The bodies are irregular, particularly those of the moon, which, when closely examined, exhibit irregularities, the cycle of which were never determined from observation alone. 2. At the time when the controversy about the earth's motion took place, the time of observation was so short, for instance, could not be predicted within several minutes. 3. By means of the labours of Newton and his successors in theory, and Flamsteed and his successors in observation, the prediction now rarely differs from the result by more than half a second. 4. It is a well-known opinion of those concerned in bringing astronomy to this state, not merely that the earth has a motion both of rotation and orbital progression, but that the proofs are such as to leave no doubt whatsoever on the subject; and in history we find an extra person who was mathematician enough to read the writings of Newton ever entertained any hesitation upon the subject.

MOTIONS OF PLANTS are phenomena connected with specific vital forces, and no principle of explanation upon any known principle. As they are very common, but excepting in a few cases, usually overlooked, it is necessary to notice their existence. Locomotion, that is the power of transporting themselves wholly from one place to another, is a property assigned to living beings characteristic of the kingdom to which they belong, and is stated not to occur among plants: nevertheless locomotion in its exact sense does occur among some of the lower plants. Amongst Confervea is a genus named Oscillatoria, consisting of green, slender thread-like filaments, which, by the oscillating motion observable in them, these plants not only move their limbs, but shift their station with some rapidity; for example, if a patch of them is placed in water in a plate, and a black bell-glass is inverted over them as a roof, with the whole edge downwards. Oscillatoria will remove from where they were first placed, and glide out on the side of the bell-glass which is exposed to light. The late Captain Carmichael observed their motions with great care, and sufficiently proved that they were not owing to external causes of any kind, but not to agitation of the water in which the Oscillatoria are placed. Let, he says, a small portion of the stratum be placed in a watch-glass nearly filled with water, and covered with a circular film of silt, so that its edge may touch the
glass; the water will be rendered as fixed as if it was a piece of ice. The glass may now be placed under the microscope, and the oscillation of the filaments viewed without risk of disturbance from the gum. As the water flows down, in its course, it will be speedily perceived that the motion in question is entirely independent of that cause. The action of light, as a cause of motion, cannot be directly disproved, because we cannot view our specimens in the light. But if, by the watch-glass, charged as above, be laid aside for a night, it will be found that, by the next morning, not only a considerable radiation has taken place, but that multitudes of the filaments have entirely escaped from the stratum, both in length and breadth. Hence the observer, with a watch-glass, may at pleasure, and without disturbing his specimens, will show itself in a prolongation of the filaments, but will not account for this oscillation to the right and left; and still less for their travelling, in the course of a few hours, to the distance of ten times their original length from the stratum.

This last is a kind of motion almost unexperienced in the vegetable kingdom.

Another kind of locomotion has been seen in the reproductive particles or spores of certain Conifers. At a particular moment, the spores move about with velocity, in a gyratory manner, till they are impelled slips and move away from each other, after which, being turned in the one end, produce a root, and lose all power of after-motion; so that such plants have locomotion when young, and are destitute of it when old. Many such phenomena are known to occur in plants of the same low kind of organization.

But while locomotion thus unquestionably occurs among some kinds of plants, vegetable movements are more commonly confined to the limbs, in which they are visible in different ways. A kind of motion occurs in roots, although not pertaining, except by its effects, to the true plants. 

Iridaceous plants appear one season in a spot at some distance from which they occupied in the previous season, and thus appear to travel; in such cases however the shifting of place is effected by means of underground suckers, arising from the parent, which projects them to a certain distance from herself, and then perishes. The corms, or bulbs, as they are called, of many Iridaceous plants exhibit the same kind of property, raising themselves year after year, so that if originally buried some inches under ground, they at last travel upwards into the air; this is effected by each cormus forming a bud at its apex, which bud grows into a new cormus and kills its parent, forming a new cormus at its own apex, and then perishes; the parent is thus preserved in a most singular manner by palms, but in those plants takes place in a different way; some palm-trees, which originally had their stem resting by its base on the surface of the ground, force it upwards by protruding the barker and the bud.

Several cases of this power of motion occur in Orchidaceous: if the calycal of the pollen masses of Catsatum is disturbed, it springs up so violently as to separate itself from the column on which it grows, and to dart to a considerable distance. A very singular instance of motion in the flowers of another plant of this kind, growing in the estuary of the River Colours, has been noticed by J. A. van Romboud (Gardener's Gazette, vol. xiv., p. 426). The lower lip, he says, in which the anthers are placed is a boat-shaped box; the upper lip, which he supposes to be the stigma, forms a lid which exactly fits it; the hinge on which the box moves is fixed to the column, and the other end of the box is attached to its centre; and when it opens, the upper part turns round within the box, comes out at the bottom, turns up and back; so that when fully expanded it stands fairly over the flower. The moment a small insect touches the back of the box, it is suddenly opened, and the column presents to its point of the lid at the bottom of the box, so that it has to pass the anthers in its way, and makes prisoner any small insect which the box will hold. When it catches an insect, it remains shut while the insect moves about; but if the insect be not caught, the box soon opens again. This and here imperfectly described is perhaps a species of Caleana.

Another kind of motion, more resembling spontaneous action, especially as it is not apparently connected with the application of stimuli, is that which occurs in the sexual organs of plants in the nascent states of the flowers. In Armeria at this time a short column below the stigma lengthens, so as to close up the foramen of the ovule, and at the same moment the cortex on which the ovule is sus- tained moves outwards, and the coryne and one of the stamens turn the stigma to present its foramen to the column; the same phenomena are visible in Daphne Laureola and other plants; and something of an analogous nature occurs in Zygmennata, which at the period of fructification bring themselves together and both affect a kind of spontaneous action. The most striking phenomena of this nature occur ever in Aesclepiadaceous, which have their pollen grains closely packed in bags, from which it would seem that there is no escape; at the period of impregnation, each of these pollen grains is packed within a tube; these tubes all direct themselves spontaneously towards a thin space on the side of the bag that holds them. Piercing this bag, they succeed in extricating themselves and reaching the vicinity of the stigma, but are still at some distance from it; they then thrust off a pollen-tube, which grows towards that stigma and succeeds in reaching it, wherever it may be, either by directing themselves at right angles, or downwards, or even upwards, as the peculiar structure and location of the stigma may require.

In the sensitive plants, various species of Mimosa, especially M. pudica, the leaves fold up on being touched, and this so slowly, that it is easy to perceive that the folding is effected by the gradual communication from leaflet to leaflet, and that the juncture of the leaflets is a simple portion of the end of one of the leaflets of the Mimosa is cut off, the whole of the leaflets of that pinna gradually fold up, one after the other, from the point to the base; then the neighbouringly pinnae will fold up their leaflets from the base to the point. The tip of the leaflet may be cut off, and it will bow itself down; whereupon the folding up of the remainder of the pinna will take place sometimes, after a little space, the leaves above and below will also close up, all under the influence of the one original injury. These various phenomena have been watched with care by Du Trochet, in whose little book, 'Sur la Moitliet des Plantes,' a long and particular account of the phenomena will be found. Many other plants possess this kind of sensitive power in their leaves; Smith in his 'Kunstmalerey' and Portier in his 'Physiologie Vegetale,' p. 857, where several of the modes are enumerated in which leaves having motion close up.

The 'sleep of the leaf,' that is, their folding up and dropping at night, while they raise themselves and unfold by day, are powers of motion in the limbs of many plants. These are doubtless of the same nature as that of the sensitive plant and its allies. To the same class also must be assigned the fly-catching leaves of Dionaea: this plant, which grows wild in the marshes of Carolina, has a leaf which is bordered up and down by a line of sharp teeth, and is essentially similar to one of the toothed iron traps when set as used for catching game, that is, it consists of two roundish
sides, each furnished with a row of strong teeth. Near the middle of each side there grow three stiff bristles, placed in the form of a triangle: if one of these bristles is touched by an insect or any other means, the two sides of the leaf spring up instantly, the teeth cross each other, and the insect is held so fast, that it can only be extricated by forcing the sides of the leaf together, an operation of some difficulty, so that it is almost a force for which the insect is not prepared. These movements are all owing to a specific irritability resident in the moving organ, and must be distinguished from the following, which takes place, to all appearance, spontaneously.

In a tum gutter, the Gora-chand of Bengal, was first mentioned in systematic botany by the younger Linnaeus, who speaks of it as a wonderful plant, on account of its singular motion. 'No sooner,' he says, 'had the plants been raised from seed acquired their tertiary leaves, than they began to move in every direction: this movement did not cease during the whole course of their vegetation, nor were they observant of any time, order, or direction: one leaflet frequently revolved, while the other on the same stalk, was quiescent; sometimes a few leaflets only were in motion, then almost all of them would be in movement at once; the whole plant was very seldom agitated, and that only during the first year. It continued to move in the stove during the second year of its growth, and was not at all in the least affected by the presence of this food.' Burnett adds, 'is never so great, even in our best houses, as it is said to be in its native climate, and its motions here are very seldom so lively as those described by Linnaeus. Warmth appears essential, for its movements and those of all the other plants with which it is connected, are not attributable to the sun's rays, nor to any currents of air, is shown from the fact that the plant loves the shade, and that the motion is most evident when the stove is closed and the atmosphere quite still. These motions have not the semblance of spontaneity, nor any others that have been observed in the more perfect plants; for the leaflets, if held quiet between the fingers for a short time, and their movements thus prevented, are said immediately on their release to revolve with accelerated velocity, as fast as before, for the former interruption.' De Candolle describes the motion thus:—

'the leaves consist of three leaflets, two of which are lateral, very small, linear, and oblong, and an odd one, separated from the others, much larger and oval-oblong: the two side leaflets are in almost continual motion, which takes place by little starts, the small hand that marks the seconds in a watch. One of these rises so as to mount a little above the level of the petiole, and the other falls on the side leaflet: when the former rises, the latter rises, and thus a constant oscillation is maintained. The central leaflet also moves, but much more slowly, sloping first to the right, then to the left, and so on.'

'It is a fact, that the cause of these singular motions may be never explained, and it seems useless to inquire: they appear to belong to the class of first causes, concerning which we can know nothing further than their effects. It is evident that they are quite distinct in their nature from such motions as that of a stem bending towards the light, in consequence of the process of its solidification taking place on the side exposed to light than on the other side.

If no mention is here made of the motions of internal microscopic particles upon their own axis, when floating in water, such as were remarked by Brown and others in pollen, and as may be found very commonly upon bruising plants in water, it is because such particles appear in all cases of rotation, motion, however singular; to be a physical rather than a vital phenomenon.

On Motion of Sap see SAp.

MOTRIL [Granada.]

MOTTI, ANTOINE HOUARD DE LA, was born at Paris, 1716. His father, original banker at Troyes, where he possessed a small estate, called Le Moulin, whence the surname of the family was derived. After completing his studies at the Jesuits' College, he turned his attention to the law, which he shortly after gave up for painting, and lived a large part of his life at a small theatre in the representation of Mollière's comedies. In 1693, being then only twenty-one years of age, he produced at the Théâtre Italien his first piece, entitled 'Les Originaux,' with little success. This piece was not inserted among his works, but is printed in the 4th volume of Grecourt's "Histoire de l'Italie." Disappointed at his failure, he resolved to renounce the world, and retired with one of his friends to La Trappe, but the Abbé de Rancéc, setting little value on the momentary enthusiasm of two inconsiderate young men, dismissed them at the end of two months, without giving several of his habit of withdrawing.

After returning to Paris he produced his opera 'L'Euripide Galant,' which was very successful; in 1757 a volume of Odes, which, although much read, added nothing to his reputation; and in 1710 his 'Academical Discourse,' a model of the kind.

The most presumptuous and extravagant act of La morte was his translating the Iliad, without knowing a single word of Greek, and abridging that poem with the intention of improving it. This translation was preceded by a discourse, in which he endeavoured to prove that all ancient nations, and particularly Homer, was a modern preface. Madame Dacier refuted this discourse by a tract entitled 'Des Causes de la Corruption du Grec,' to which La morte replied by his 'Réfutation des Causes.' At the age of 40 he became blind, and also lost the use of his limbs, in which condition he remained for many years, and died 25th December, 1731.

His works, including his letters to the duchess de Maupeou, were collected in 1754, and printed 10 vols. 12mo. (Boug. Univ.; Volt. 8.)

MOTTEUX, PETER ANTHONY, was born at Rochas in Normandy, in 1660, at which place he also received his education. After the revolution of the Edict of Nantes he was persuaded to come over to England, where he got involved in some difficulties, and having to clear himself in a large East India warehouse a leaden-ball street. Being master of several languages, he obtained a situation in the foreign-letter department of the Post-office. His death, which was attended with some circumstances, took place in February, 1714, in a disorderly house in the parish of St. Clement Danes, and being the anniversary of his birth, completed his 55th year. His remains were interred in the church of St. Mary Axe, London.

This gentleman so completely acquired the English language as to be able to produce a translation of 'Don Quixote,' and subsequently to write several songs, prologues, and epilogues, one of the latter of which will be found at the end of Sir John Vanbrugh's comedy of 'The Muses.' He also wrote several plays, namely: 'The Loves of Mars and Venus,' Lond., 1697, 4to.; 'Beauty in Distress,' a tragedy, Lond., 1698, 4to.; 'The Temple of Love,' 1706, 4to.; 'The Amorous Miser,' a comedy in 3 acts, 1705, 4to.; also a poem entitled 'The Toe,' 1712, 8vo., with several French works translated from the English.

MOTTO, an Italian term, shortened by some of our old writers to mot. It means a word or sentence added to a device; and is commonly used, when put upon a scroll, as the external inscription of a piece of costly work; for this purpose is antient, and as appertained to a cost of arms they are frequently hereditary in families. In strictness, the motto should bear allusion to something in the achievement, but in modern times the taking of it rests entirely with the owner; and often is only a charge at pleasure. A sentence or quotation prefixed to anything written is also termed a motto.

MOULDINESS is a name applied to all minute fungous bodies which appear in masses upon organic bodies. It appears to be caused by the action of the atmosphere upon the surface of all organic bodies, both which conditions are favorable to the development of those bodies whose spores or reproductive particles are floating everywhere in the atmosphere, ready to spring rapidly into growth whenever they chance to fall upon suitable situations.

All the fungous which constitute mouldiness are so small as to escape observation, except when from their numbers they form microscopic forests, and then they clothe the surface of the body which they attack with light patches of yellow, blue, white, green, red, and in some cases of black. The places of these plants are extremely numerous, and are distributed

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* La morte's tragedy, called 'L'oeuvre de Castor,' is mentioned by Voltair, ('Memoires de Louis XIV,) as one of the most interesting of those which had kept men alive on the stage.

It is perhaps, however, by the title-page of an edition of 'L'Euripide Galant,' London, 1706, 4to. 8vo. which, that Mottou was only the publisher, and that the work was translated by several hands, and printed for Samuel Buckery, or the Dolphin, Little Britain.
by writers on fungi into many genera, chiefly belonging to the Hyphomycetous division of the order, the combining character of which is, that the plants are flocculent, naked (that is, not enclosed in a case, or seated upon a peculiar receptacle), distinct, but interwoven into a general mass, which looks like a thin web, or a collection of cobwebs.

One of the most common is the Ascoaphora Mucedo, which forms a blue mould upon bread, paste, and similar substances prepared from flour. This plant forms a fine horizontal cobweb-like bed, from which rise up slender branches terminated by an expansion which bears the spores.

Ascoaphora Mucedo, very highly magnified. a is a sporogenous branch Casei, from the horizontal bed; b is the termination of a branch covered with spores.

Another form is that of Penicillium, in which we have the same entangled flocculent bed, and a similar elevation of perpendicular branches: but the latter are not terminated by a disk covered with spores; on the contrary, they end in a jointed tuft, every division of which produces at its point a necklace of spherical sporeings.

Penicillium verticillatum, highly magnified. a represents a cluster of perpendicular branches springing up from the horizontal bed; b is one of the penicillum-like heads which terminate the branches.

Mouldiness is occasionally produced by Coniomycetous fungi—that is, by those very imperfectly organised species which have no flocculent bed, nor any special part on which the spores are generated, but which merely consist of a series of joints within which reproductive bodies are formed. Of these, the Torula Casei, found in the crevices of putrid cheese, may serve as an example.

Many of these plants are capable of living under circum-
stances that would be fatal to any other form of vegetation; for example, Ascoaphora Mucedo springs up plentifully in paste poisoned with corrosive sublimate.

A mould of Torula Casei, very highly magnified, after Corda.

Their general station is upon decaying animal or vegetable matter; but one species, the Botrytis Bianiana, attacks the living silk worm, and kills it; others feed on house-flies, which may be seen in the autumn glued by these parasites to the window, on which they have alighted in a semitropical state.

The following are the botanical names of some of the more common species of fungi that cause mouldiness:

Hydrophora stercorea (yellow, turning black), on the dung of various animals; Mucor mucedo (bluish black), on fruit, pastry, &c.; Eurotium herbariwm (white, yellow, or orange), on damp plants in Herbaria; Cladosporium herbariwm (green, turning black), on various decaying bodies, damp paint, &c.; Aspergillus candidus (white), very common; Aspergillus glaucus (blue), very common.

MOULDINGS (in Architecture), any assemblage of narrow surfaces projecting from the face of a wall or other surface and also advancing one beyond the other. They are bounded by straight lines, either horizontal or vertical, according to their situation, but the surfaces themselves are plane or curved, and if the latter, concave or convex, or else compounded of both forms; and again are either plain or curved. Sometimes indeed, instead of projecting, mouldings are sunk, as is the case when they form a border within a sunk panel, for though they project with respect to the surface of the latter, they recede within the general face of the wall. The mouldings within the pannels of doors are of this description. Mouldings are employed as borders to doors, windows, and other apertures, as arches, in which latter case they are termed architrave mouldings; while those forming the imposts from which the window sills are called impost mouldings. The bases of columns likewise consist of mouldings. They are also employed to mark the horizontal divisions of a wall, both internally and externally, and every member to which they are applied is said to be moulded. As their edges are straight lines, their contour can be shown in drawings only by their shadowing, and by the outline which they produce at their extremities, as in the case of a cornice. But as this is insufficient, except to afford a general idea, in working drawings and those of detail mouldings are shown on a larger scale, and by means of a section through them, by which their profile is accurately defined; and upon a good profile, that is, one where the mouldings are well proportioned to each other, and so combined as to purposely to relieve each other, and to produce both an agreeable variety of surfaces and of light and shade, much of the beauty and finish of a building depends.

Mouldings are distinguished by different names, according to their profiles, their sizes, or their situations. Thus the fillet, term, band, are all plane or flat mouldings, the only difference being that the first-mentioned is narrower than the others, and frequently is not so properly a distinct moulding as a space left between other surfaces, or else a rim to a larger moulding, as to a cymatium terminating a cornice, &c., while term is the name given to the broad fillet separating the architrave from the frieze in the Grecian Doric entablature, and band is applied to any still broader plane surface—thus if instead of dentils, in an Ionic or Corinthian cornice, a projecting plane surface be left where they would occur, it is called an uncus dentil band. The corona (one of the principal members in every cornice) is also a mere plain band, except that it is occasionally enriched
in Roman architecture. Again lesser convex mouldings are termed *beads*, but the longer mouldings of the same kind in the bases of columns are termed *tors* or *toruses*. The *cyma recta*, or *cymatium*, is a compound moulding, concave above and convex below, while the *cyma reversa*, or, as it is technically termed by workmen, the ogive or ogive moulding, is convex below and concave above. The *canetto* is a mere hollow or sweep intervening between and serving to connect two mouldings, one of which projects beyond the other. The *cornice* or *corbithus* of the base of a column, is a moulding of this kind upon a large scale, and has therefore a distinct name assigned to it, which also points out its situation. The *ovo* is a name given to such mouldings, and, although it is occasionally used to describe carvings into *ovas*, or ornaments in the shape of eggs, within hollows. The ovo of the Doric capital (which is always uncut) is distinguished by the name of *echinus*. All the other mouldings may be carved or enriched, except the *canetto* and *fillet*; the pattern being accommodated to the surface of the moulding. The *cyma recta*, or *talon*, as it is sometimes called, is cut with a peculiar kind of tongued or arrow-headed ornament.

These mouldings are common to both Grecian and Roman architecture, being more profusely applied in the latter style, they have this marked difference, that in Roman architecture the curved mouldings, whether simple or compound, are described by quarter circles, whereas in Greek they describe other curves obtained from conic sections. All the Grecian mouldings there are elegantly simple, and their contour, but susceptible of far greater variety. Some of them are also occasionally *undercut*, that is, hollowed out below and behind, whereby, while a greater depth of shadow is obtained, a greater sharpness, definition, and lightness of form is produced. Of this kind is what is now generally called by the name of the *bird's-beak moulding*, because its section produces an outline very much resembling that of the hooked upper and lower mandible in the beaks of some birds. In Gothic mouldings, undercutting is not so common, and hollows or recesses more or less deep are frequently numerous in the profiles of mouldings in that style. The mouldings are also for the most part produced by *sprayed* or *bevelled* surfaces, that is, slanting or turned obliquely, their fronts or profiles plane where they occur. In that style the mouldings are so numerous, and the profiles produced by them so complex, as to render it impossible to describe or characterise them further. They are however of the utmost importance, and therefore require to be well studied, and purpose such works of detail as Pugin's 'Gothic Specimens' and 'Gothic Examples', Moller's 'Denkmale', &c., may be recommended. One circumstance however which ought to be noticed in the mouldings is the face of the wall (like those of pannels), except labels, hood-mouldings, and others, that come under the general denomination of *weather mouldings*, because made to project instead of recede, and therefore more exposed to rain and weather.

In regard to Grecian mouldings, it remains to be observed that many of those which are uncared, and therefore supposed to have been quite plain, were painted with some ornamental pattern, and that not infrequently in the most brilliant colours. But this singular mode of decoration is treated more at length in the article POLYCHROMY.

MOULINS, a town in France, capital of the department of Allier; situated on the right or east bank of the river Allier, in lat. 46° 6' N. and long. 4° 19' E. long; 161 miles from Paris by the direct road, and 236 miles by the road through Fontainebleau, Montargis, and Nevers.

This town is scarcely noticed before the thirteenth century, when Robert, Count of Clermont, son of Louis IX. (of France, and, as it is generally supposed, by his family, founded here an hospital. It owes its name to the number of water-mills which were formerly here. It became capital of the Bourbounois, and the residence of the dukes of Bourbon, one of whom, Louis II., built a castle at Mont-Vernon, and by the Duke Louis I., upon acquiring possession of the Bourbounois, after the forfeiture of the Constable Bourbon, in the early part of the sixteenth century. Of this castle there is only a part remaining, namely, a square tower used as a prison, and some buildings occupied by the gendarmerie. The town is agreeably and advantageously situated in a fertile plain, on one of the roads from Paris to Lyon, and on

the bank of a navigable river. The immediate vicinity is very delightful; it is well wooded, and among the trees were formerly many mulberry-trees, planted for rearing silkworms; these trees thrived exceedingly, until the decay of the silk manufacture, consequent on the Revolution, led to their being neglected or destroyed. The town is an ancient site, and is tolerably well built.

The houses are chiefly of brick; the fronts are ornamented with figures formed in black bricks, the French style. There is a large river, the Creuse, and a ridge over the Allier, about 700 feet long and more than 42 broad, with foot-pavement. It was built in the middle of the last century; it cost and labour were bestowed in fixing the foundations; the ladies of Montreuil, by the Allier, are in the middle of the river so insecure, that four bridges had been destroyed in the previous century. Beyond the bridge is a fine avenue of trees, extending about two miles in a straight line along the road to Limoges and Clermont. Moulines contains several pleasant promenades, and some handsome public buildings. Of the squares, that of Allier is the largest and most regular. There are a handsome town-hall with a clock-face, and a court-house lately built. In the church of the Visitation is the monument erected by the Princess de Conti, mother of the late King of France, who was buried there in 1785. Montmorency, beheaded at Toulouse by order of Louis XIII. There are fine barracks near the bridge, public baths, large hospitals, and a small theatre.

The population of Moulines, in 1831, was 14,072, for the department.

The chief manufactures of the place are cutlery, especially excellent scissors.

These articles are hawked about by women, who beset the greatest importance the travellers arriving in the town. There are several establishments for the manufacture of throwing silk. There are manufactories of blankets, cotton counterpanes, woollen stuffs, and hats. There are tan-yards and steam-mills for corn. Trade is carried on in corn, wine, iron, timber for ship-building, wool, cattle, in 1831, amounted to more than 33,000. The town itself is distinguished by their kindness of manner. There are coal-mines and quarries of limestone in the neighbourhood. Marble of different colours is found, but is not worked. Moulines has several judicial and fiscal departments, and possesses post, telegraphs, and public communications. The town has a grammar school, and a collection of paintings and engravings.

MOUNTAIN LIMESTONE is a great and eminent general of the age of Louis XIV., was a native of Moulines. Moulines is the seat of a bishopric, of which the department of Allier constitutes the diocese. The bishop is a suffragan of the archbishop of Sens and Reims.

The department of Moulin, has an area of 1062 square miles, and communicates by 687 communities. It is divided into nine cantons or districts, each under a justice of the peace. The population, in 1831, was 64,937; in 1836, 90,362.

MOULIN-A-VIN [MOUNTAIN MOUTING. [infra 426.]

MOUNT VERNON. [VIRGINIA]

MOUNTAIN LIMESTONE. Mr. Smith emphatically terms this term to designate the calcareous rocks which underlie the coal strata in England. It is the equivalent of the term *carboniferous limestone* of Conyngham and many other English geologists. Some German writers have transferred the term into berg-kalk, while in France the corresponding version of Mr. Conyngham's title, 'carrière carbicium' appears to have been less commonly used. The most perfect and characteristic limestone rocks are the mountains and the mountain. Moreover, the name is sometimes given to a single elevation or peak, as Mount Atina, &c., and sometimes to a whole and extensive cluster of eminences, as Mount Vernon and Mount Waverley, sometimes a group of hills, and what they do exist generally, though not always. The general disposition of mountains is in groups or chains. The word group explains itself, but what is understood by a chain may not be so clear. When hills or mountains are so arranged as to form a line or band which greatly exceeds its breadth, such a disposition, whether the line be straight or curved, is called a chain, and sometimes
a ridge; though the latter name is more exclusively applied to the lesser chains. We are not however to understand by a chain of mountains, a single unbroken longitudinal eminence, like that formed by the connected roofs of a row of houses. A chain of mountains, on the contrary, is very irregular in course and detail of many subordinate parts. In a complete chain there are ridges and parallel or nearly parallel ridges; the centre one is usually the highest. These three ridges, though distinct, are seldom equidistant from each other, and they are frequently united. From the points of junction of the three ridges, other chains strike off at various angles, and these in turn divide the whole system of a chain into the principal, principal, or great chain, and secondary and tertiary chains; but these names having now reference to the order of formation of rocks rather than to their disposition, though the latter circumstance is greatly dependent on the former, they are at present confined to geological considerations, and we therefore say such a chain or ridge is a branch of some other chain or ridge. Thus the Apennines are a branch of the Alps. Minor ramifications, when short, are called groves or gorges; when long, mountain-chains; and in some chains, the former, is at that particular spot, higher than elsewhere, so that between two consecutive elevations there is an apparent depression; hence the summit or ridge-line of the main chain is at some points higher than the peaks, domes, &c., according to the passage of the chain. Now these peaks which receive the general name of passes, because they are the places where the passage over the chain from opposite valleys is most easily effected. These passes or passes are sometimes quite natural, and sometimes artificial, such as the passes in the Jun. They are also called gorges or defiles, but incorrectly, for the gorge is properly the contracted part of a valley, and the defile a very narrow passage at the foot of the mountains or winding amongst them. The ridge-line of a chain has in many places slight undulations, it is sometimes very narrow and sometimes very broad, and in some places spreads out into what is termed table-land (Langfied in Norway). Table-lands, or plateaus, are however not always of this terrace form; they are not frequently sunk, if we may so say, into the broad summit of the ridge, so as to be surrounded by lofty eminences and peaks. Table-land is also sometimes ascended by gentle acclivities, without any appearance of mountains.

The valleys which are situated between the parallel ridges are divided into three classes of valleys; their axis, and consequently the principal watercourse, is nearly parallel to the direction of the chain. The valley of the Rhone above the lake of Geneva, the valley of the Magdalena in South America, &c., may be taken as examples. Two things have an influence in longitudinal valleys: first, that there is sometimes so perfect a conformity between the re-entering angles on one side and the salient angles on the other, that if it were possible to bring the two sides into contact, they would perfectly correspond, so as to leave no trace of their having been separated; and, secondly, it has been observed, that the side of the valley opposite to the centre ridge is the steepest. These observations are true as regards many places, but are by no means to be received as universally correct. The other valleys, while they are formed by various angles with the direction of the great chain, are the principal valleys of a country, and are usually designated by the names of the chief rivers which flow through them. The valleys of the tributary streams which empty themselves into the main rivers of a country are called lateral valleys. The parallel upper and lower valley are sometimes used to denote the parts of a valley as they lie along the higher or lower part of a river's course. Such then are the parts of a regular chain of mountains, but we are not to suppose that all those great chains of mountains have a regular direction, therefore thus regularly formed. Mountains are sometimes grouped, as we have said, as to present no appearance of a chain; sometimes the chains run parallel, but wholly independent of each other; in some cases they radiate from a common centre, but in others, nothing can with propriety be called regular than the arrangement of the mountains, and they differ as much in height, steepness, and particular appearance. By some (Bergmann) it has been imagined that in chains running north and south the western slope is the most abrupt, and that when the chain runs east and west the southern slope is the steepest. But this is far from being always the case, and General Androsyow has laid down a principle that the steep side of a chain of mountains is that which looks towards the higher part of the general slope on which the chain is set. This opinion is doubtless better founded than that which nevertheless it is not strictly correct; and there seems reason to believe that no general law obtains on this subject.

The appearance presented by chains of mountains is not only very different in different parts, but the very same chain may be very different when seen at a distance, and yet more so when seen nearer. At a distance the minute irregularities are lost in the general contour, and the particular shadows are blended into a uniform tint. The forms of rocks generally depend on their nature, and a practised eye can sometimes pretty correctly divine the latter from the former. These may either present the aspect of needles or sharp pointed masses, or the summits may be dome-shaped, or stretch along like a vertical wall, either entire or bearing a resemblance to ruined battlements and towers; sometimes the whole mass is piled up into a succession of gigantic steps or terraces. Individual mountains and hills also vary in form; those which are volcanic are generally conical; others are round, oval, lumped, saddle-backed, &c. Thus the natural water-sheds and the limits of the seas or aquarum, but it must not be thence inferred, as has too frequently been the case, that all water-sheds are mountain chains. This erroneous idea has covered our maps with mountains where in nature not a hill is to be seen. Another error, which, if not corrected, would place the whole earth as so many connected chains, which, by starting from some particular point, may be traced stretching and branching continuously over the whole surface of the globe. The map of Italy is a fault in this respect, the changing of the difference in the arrangement as described by different writers. The truth is, that mountains are scattered over the surface of the land in the greatest confusion, here isolated, there in groups, and in chains; the chains being so connected as to form a complete series, not in one place running in parallel directions, in another intersecting, crossing, or branching off at different angles; in some cases completely enclosing a certain extent of country so as to form an entire and perfect basin, in others only partially enclosing a space. In one country the mountains are set in the centre, or near one of its coasts, and in the direction of the greatest length of the country; in another, they are set across the country. In fact, the chains are observed to be in all possible directions, both as to the compass and to the parallel, or coast-lines. Thus, with the exception of the Andes and the Rocky Mountains, the Appalachians, the Ghauts of India, the Scandinavian Alps, and the Apennines, there is very little conformity between the direction of mountain-chains and the configuration of countries.

Mountains have a very important part to perform in the general economy of the earth; they arrest the fleeting clouds, whose precipitated waters they store up in their interior and exhaustless reservoirs, whence springs are continually issuing, which unite and form those streams that fertilise the plains, or, collected into mighty rivers, favour the transport of commodities and facilitate the intercourse between the ocean and the interior of the continent. The influence of mountains on local climate is all-powerful, and depends upon the direction in which they lie as regards the sun's course, their height, their position on the surface of the globe, their proximity to or remoteness from the sea, the winds they arrest or give passage to, &c. Mountains at a distance from the sea may have a great variety of climates. Thus in ascending from the sea towards the summit of the Andes, every kind of climate is passed through as completely as if the traveller were to proceed from the equator towards the Arctic pole. For about 16,000 feet from the Andes under the equator, we reach the limit of perpetual congelation; and mountains in that region which exceed that height have their summits covered with eternal snow. The line of perpetual congelation is however sometimes found at a lower altitude, and it is a limit of the desert with nothing but snow on the face of the earth. It approaches that surface as it advances towards the poles, but the laws which determine this line are still very imperfectly known. [CLIMATE.]

The limits of perpetual congelation, as ascertained from the stability of snow on the mountains, are subject to vary
with the particular aspect of the mountains and other local circumstances. Thus, generally speaking, the snow-line is highest on the south side of mountains in the northern hemisphere, and vice versa; but this is not always the case, and according to M. Jaucquet, the line of perpetual snow is much higher on the northern than on the southern side of the Himalaya mountains. Mr. Pentland states that the limit of perpetual snow is at an elevation of 10,600 feet on the mountains of Yucatan in South America, which are as much nearer the equator.

The fact of the cold increasing as we ascend mountains is due in part to the greater rarity of the atmosphere in the higher regions, and to their greater distance from the radiated heat of the plains; nevertheless the particu- lar atmosphere of the various parts of the mountains acts as a shield against the sun, and the confirmation of the higher valleys, greatly modify the cold of particular places; and a much greater heat is sometimes experienced in a high valley than is felt in one much lower down. To this circumstance is due in part the seeming anomalies that are met with in the habitati- on of plants, many being found at heights where they would be little expected.

Though mountains are such striking objects, and, when compared with the meadows and forests, seem altogether out of place, yet one notices above the sea, appear to be enormous protuberances on the earth's surface, they are very inconsiderable when compared with the whole mass of the globe. The habitable parts of the earth, at least those where population is most dense, and the industries of mankind are most concentrated, are all within a few hundred feet above the sea, which may be regarded as a part of the true surface of the sphere. But even the height of the loftiest mountains, which is about five miles, is only about one hundredth part of the radius of the earth. In the books of travels we often find the distance mentioned at which a particular mountain is visible. As observations of this kind are sometimes loosely made, the following rule will serve for roughly estimating the distance at which a mountain of known height can be seen from the surface of the sea. Multiply the height of the mountain in feet by 1.25; the product will be the distance in miles at which the mountain is visible.

With regard to the heights of mountains it may be observed that they vary considerably. Some authors however regard every eminence below one thousand feet as a hill. Since the application of the barometer to the measurement of heights, there are few mountains of any importance, in Europe at least, with respect to whose height the sea is not now known and registered. A list of the principal mountain heights on the globe would fill a volume. It may be suffi- cient here to give the heights of the principal peaks of some of the more important chains.

**Asia.**—Dhaulagiri, 28,077; Jewahir, 22,747. These two are peaks of the Himalaya. Mowms Row, Sandwich Is- lands, 15,688; Ophir, Sumatra, 15,840; EEmont, New Zealand, 11,430; Haik, of the Avernian chain, 10,325; Ararat, Armenia, 17,260; Arigk, Anatolia, 10,000; Olympus, Anatolia, 6500; Lebanon, Palestine, 5900; Askawa, a volcano in Kamichitka, 12,000 feet.

**America.**—Nevado di Sorato, 25,330; Illimani (the richest gold mountain of Peru), 24,400; Chimborazo, Andes, 21,600; Aconcagua, 22,044; Cotopaxi, 19,424; Popocatepetl, Mexico, 17,720; the last four are volcanoes. Rocky Mountains, 11,000; Mount Washington, Appala- chians, 6650.

For the details of particular chains and remarkable mountain peaks see the several sections.

**MOUNT SORREL.** [Leicestershire.]

**MOUZUCK.** [Fezzan.]

**MOUSE.** [Muridae.]

**MOVEMENT**, in Music, a detached and independent portion of the work, see the several sections.
in the stage of a disease in which it may be most advantageously applied. The general principles which should regulate the use of blisters have been already explained [BLISTERS], as well as those connected with the actual cautery [ESCHAROTICA], the following observations refer to its distinctive characteristics. We may remark that the pain is not so great as might be expected, indeed less than usual in blisters, and that it is often borne by females and children without the least inconvenience.

Besides the secondary effects of the local application, which, being of a counter-irritative kind, are common to blisters and moxa, in the case of the latter there is the additional resistance to the action of the moxa. This resistance is caused by the amount of calorific Celorco, applied under certain circumstances and in appropriate restrictions, stimulates in a powerful manner the capillary vessels, causing them to contract their diameters, and to circulate their blood with greater velocity; and, either by this action on the capillaries, or by a direct one on the lymphatics of the part, it has also the power of exciting the function of the absorbents in a remarkable manner. The direct effects of moxa are seldom, if ever, confined to the skin; and if the moxa be applied, through the medium of a needle, the cellular may be made to propagate its influence to any depth. The beneficial influence of moxa, in relieving or curing disease, apparently depends on its tonic action over absorption and capillary circulation. Hence it should be employed in those cases only in which there exists a state of anemia, or in a state of general exhaustion of the system, or in a state of functional exhaustion; and invariable avoided wherever there is increased action or active inflammation.

To hold the moxa over the part affected, an instrument has been invented, a portion of silver-wire formed into a loop, surrounding the cylinder near the base, is sufficient. The moxa may be applied in various ways. It may be used so as not to cause any injury; in a greater degree, so as to produce a vesicle; and, in a greater degree still, eschar, which may be either deep or superficial; or it may be employed with the acupuncture needle. In the first form, it is burnt near, but not in contact with, the part affected, and is often of great service in healing indolent ulcers. In the second form, the moxa is often used in some chronic inflammations of the eye with very good effect. In the second form it is also to be held near the skin, and continued till a blister results. In tic douloureux of very superficial nerves this is sometimes beneficial. The third form is the most common, and finds the part to which the moxa is intended to be applied is marked out, and the moxa being surrounded with a piece of card-paper, which has been moistened with a solution of common salt, to protect the adjacent skin, the moxa is ignited, and the combusted portion of the moxa is, if necessary, by means of a blow-pipe. For the cure of obstinate sciatica and deep-seated diseases of the joints a frequent repetition of the moxa may be required, but it seldom fails to produce a good effect. As long as the acupuncture needles are used together, a moxa of a proper size is to be perforated by a needle of such a length as will be sufficient to reach the seat of the disease, and at the same time extend so far from the surface of the skin as to keep the moxa about one inch from it. The needle is then introduced, and the moxa is now put in a state of combustion, and the heat disengaged from it is communicated to the needle, and thence conveyed to the seat of the disease. [ACUPUNCTURE.] When the pain from the third mode of applying the moxa is very great, a linseed-meal poultice will generally mitigate it.

Prejudice against this remedy, on account of its apparent severity, has prevented its being extensively used, but almost all practitioners who have made trial of it can attest its great efficacy. It will rarely be had recourse to, except in cases of a neuralgic or paralytic kind of such obstinacy or painfulness as to justify the measure; but in such diseases it should not be overlooked. (Wallace, On the Action of Acupuncture.)

MOZAMBIQUE, the Town of, is the principal settlement of the Portuguese on the eastern coast of Africa. It is situated in 15° 2′ S. lat. and 40° 43′ E. long. The harbour is formed by a deep inlet of the sea, five miles and a half in length, which receives the water of three considerable rivers. At the entrance are three small islands, which, together with reefs and shoals, render the anchorage perfectly safe in the worst weather. Of these islands, that of Mozambique, on which the city stands, is formed of coral, is very low and narrow, and scarcely one mile and a half long. It is situated nearly in the centre of the entrance of the inlet. The other two islands, one on the north and the other opposite to Lagoa, is linked to the northward and S. Lagoa to the southward, lie opposite to one another, nearly three miles outside that of Mozambique; they are of coral, covered with vegetation, but without inhabitants.

The north-eastern extremity of the island is occupied by the fort of S. Sebastião, which was erected soon after the Portuguese took the place. Though much neglected, it is still a strong fortification and capable of making a formidable resistance to an enemy. The town is enclosed by two fort-like forts, one of which is built at the southern extremity of the town. The streets of the city are narrow, but the houses are generally lofty and well constructed. Nearly in the middle of the city is a large square, at the eastern extremity of which is a long and commodious stone才算, built in an archway, stretching out from the shore almost to low-water mark, and affording at all times an excellent landing for boats. On the three other sides of the square are the palace of the governor, the custom-house, and the main-guard. The palace is an extensive stone building, apparently of great age, with a flat leaden roof and a large square court in the centre. The city takes up one half of the island, and to the south of it is the Black Town, inhabited by coloured people, whose small bamboo-huts, placed in the most irregular order, form a sort of cordon or protection of their circulation, and a diminution of absorption; and invariable avoided wherever there is increased action or active inflammation.

To hold the moxa over the part affected, an instrument has been invented, a portion of silver-wire formed into a loop, surrounding the cylinder near the base, is sufficient. The moxa may be applied in various ways. It may be used so as not to cause any injury; in a greater degree, so as to produce a vesicle; and, in a greater degree still, eschar, which may be either deep or superficial; or it may be employed with the acupuncture needle. In the first form, it is burnt near, but not in contact with, the part affected, and is often of great service in healing indolent ulcers. In the second form, the moxa is often used in some chronic inflammations of the eye with very good effect. In the second form it is also to be held near the skin, and continued till a blister results. In tic douloureux of very superficial nerves this is sometimes beneficial. The third form is the most common, and finds the part to which the moxa is intended to be applied is marked out, and the moxa being surrounded with a piece of card-paper, which has been moistened with a solution of common salt, to protect the adjacent skin, the moxa is ignited, and the combusted portion of the moxa is, if necessary, by means of a blow-pipe. For the cure of obstinate sciatica and deep-seated diseases of the joints a frequent repetition of the moxa may be required, but it seldom fails to produce a good effect. As long as the acupuncture needles are used together, a moxa of a proper size is to be perforated by a needle of such a length as will be sufficient to reach the seat of the disease, and at the same time extend so far from the surface of the skin as to keep the moxa about one inch from it. The needle is then introduced, and the moxa is now put in a state of combustion, and the heat disengaged from it is communicated to the needle, and thence conveyed to the seat of the disease. [ACUPUNCTURE.] When the pain from the third mode of applying the moxa is very great, a linseed-meal poultice will generally mitigate it.

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MOZAMBIQUE, THE COAST OF, is a term used to designate that portion of the eastern coast of Africa which is situated between Cape Delgado on the north of 37° 30′ (40° 43′ E. long.) on the north, and the southern mouth of the river Zambezi (17° 30′ S. lat. and 33° E. long.) on the south, constituting the western side of the wide strait by which the island of Madagascar is separated from the mainland of Africa, and which is called the Channel of Mozambique.

Though this country lies along a sea frequently navigated by vessels sailing to the East Indies, and though the Portuguese have had many opportunities for exploring it, yet, owing to its inhospitable nature, the country is very little known as regards its principal features, with the exception of the coast-line, which was surveyed by British officers in 1823 and 1824. The Portuguese have several forts along this coast, but their
authority hardly anywhere extends more than ten miles inland, and in many places it is not even acknowledged on the shore. The island is inhabited by the Makweas, who maintain a commercial intercourse with the Portuguese, but do not permit them to visit their country.

The narrow beach is generally lined by a shore from twelve to fifteen feet high, covered with bushes and composed of sand. This strip of elevated ground seems to be of moderate width, and behind it extends a plain dotted with clumps of trees on some elevated mounds. This plain is a morass of great extent and considerable depth, and is intersected with a number of small creeks, which are from six to eight feet wide at the water. Between it and the sand-hills is a narrow strip of dry land covered with jungle, the haunt of elephants, hippopotami, deer, lions, and tigers. Along the course of the numerous rivers the country is higher and drier; it is also generally covered with forests. Whilst along the shore trees are scarce, and grow principally on the water's edge. It is not known how far the morass extends inland, but about thirty miles from the coast the banks of the rivers are high and the country covered with woods and with extensive swamps. The mountains and hills which constitute the eastern border of the table-land of southern Africa occur on the banks of the Zambesi river, about 180 miles from the sea, but that is the only place in which they extend along the coast. Vessels traveling along the coast perceive no mountains on the continent.

The sea along the shores of this country is considered very dangerous to navigators, and many vessels are lost. For a space of ten to twenty miles, it is lined by shoals, on which some of the islands are situated; dry sand, and are bare, whilst others are well wooded. Most of them are coral islands. The channel which divides these islands from the continent has generally deep water. The sea east of the shoals is navigable and unthorny. The western side of these islands are Fuego or Fogo, Mafamede, and St. Antony, all of which are situated south of Mozambique: they are uninhabited. Towards Cape Delgado are the Querima islands, which are of various shapes and sizes, and washed on one side by the long flat, extending seaward, and rising abruptly from an immense depth. Between these islands there is good anchoring ground, vessels being sheltered by the mainland to the westward, and in every other direction by islands and reefs, so as to afford security to vessels in the heaviest gales. The best harbour is formed by the islands Ibo and Matambo. Ibo and Querima are the only inhabited islands.

Here, as in all tropical countries, the year is divided between the rainy and dry seasons. The rainy season commences in November and extends to the end of March. They are abundant, and the country along the rivers is then overflowed to a distance of several miles. The heat in summer is very great, and the country not well drained; the numerous swamps render life extremely uncomfortable for Europeans, who are not inured to the climate.

The country is rich in productions. The grains which are cultivated are rice, millet, maize, and a small quantity of wheat; the most common vegetables are cabbage, lettuce, spinach, peas and beans of different kinds, tomatoes, pumpkins, and cucumbers. The fruits are cocoa-nuts, mangoes, oranges, limes, acocas-apples, custard-apples, pinesapples, guavas, bananas, and plantains. Different kinds of pimento and ginger grow plentifully. Fish and turtle abound on all the coral-banks and islands. Cattle, sheep, and especially goats, are numerous. The exports are ivory, the tuks of the hippopotamus, gold-dust, colombo-root, guns, and some amber. Formerly, a great number of slaves were exported.

The settlements which the Portuguese still maintain on the eastern coast of Africa do not extend to the north of Cape Delgado. The most northern is Ibo (12° 20' S. lat., and 40° 36' E. long.), the harbour of which is formed by the Querima islands. The Querima islands are small and closely situated to be a place of trade. Farther south is Pomuza, which has one of the finest harbours on the coast, the entrance being a channel between two rocky points, one mile and three-quarters across; but the basin into which it opens is large, and is often filled with sufficient water to receive the largest ships. This place has some trade. - Near 15° S. lat. are three excellent and spacious harbours, Port Condueca, Port Mozambique, and Port Mokambo, but only the second is used for commercial purposes.

The most southern Portuguese settlement on this coast is Quelimane, built on the northern bank of the northern branch of the river Quelimane. It is a fortified town. The river at its entrance is a mile broad, and immediately increases in width considerably. The place contains only thirty-two houses, built of brick, which are inhabited by the Europeans and their descendants, and a great number of huts for the slaves. The population is about 2000. The trade in slaves was considerable till very recently. Besides rice, it exports ivory and some gold and silver.

(Owen's Narrative of Voyages to Africa, Arabia, and Mozambique; and Prior's Voyage along the Eastern Coast of Africa.)

MOZAMBIQUE, THE CHANNEL OF, divides the island of Madagascar from the continent of Africa, washing the western shores of the island and the coast of Mozambique. Opposite the town is the narrowest part of the channel, but even here its width is 250 miles. The length of the channel, between 13° and 24° 45' S. lat., may be about a thousand miles. Towards its northern extremity lies the Comoro Islands, and to the south is the coast of Mozambique. The soils of Mozambique are tolerably good; but those of Madagascar, the best part of which lies between 5° and 15° S. lat., is more productive. The depth of water is very considerable, it being impossible in many places to get soundings close to the shore on the side of Madagascar, or close to the shoals on the opposite side.

This channel is much navigated by vessels bound to the East Indies, and in time of peace it is occasionally used for the passage than any other course; this however depends on the monsoons, or periodical winds, for the current always sets in the same direction, which is southward, and with current. From April to November, the south-east monsoon prevails, the wind blowing from the south-east. Then, the month it proceeds farther south, and about the end of it reaches St. Augustin's Bay. But it does not extend farther. The sea south of a line drawn from St. Augustin's Bay in Madagascar to the Mozambique Islands forms the coast of the Mozambique Channel, and it is quite safe to proceed farther, and as it is safe to proceed farther.

(Owen's Narrative of Voyages to the Shores of Africa, Madagascar, and the south-east coast of India; Prior's Voyage along the Eastern Coast of Africa.)

MOZART, JOHANN-CHRYSOSTOMUS-WOLFGANG-GOTTLIEB, was born at Salzburg, January 17, 1756. His father, Leopold, the son of a bookbinder, was sub-director of the chapel of the prince-archbishop of Salzburg, and employed the hours not devoted to the duties of his office in teaching the rules of musical composition, and also in giving lessons on the violin. His Violinschule, a work in quarto, published at Augsburg, in 1769, was much in demand, and was recommended to students by the scientific students. He married Anna-Maria Pertl, and what has been pointedly noticed by M. Schlichtegroll (whose Nomenclature has proved highly useful to us in the present instance,) will not perhaps be thought altogether unworthy of remark by those who investigate general and particular causes and effects, namely, that this couple, the parents of one so admirably organised for creating beautiful harmonies, were distinguished by personal beauty of the rarest kind and the greatest refinement. The composer died when but a few months old, except the subject of this notice and a sister four years his senior. The latter received instructions on the harpsichord from her father when her brother had scarcely completed his third year, and at that early period founded the great taste, which is pleasure afforded him by combined sounds, as well as his aptitude for music generally. His amusement was to seek out thirads on this instrument, and his success was followed by the strongest demonstrations of infantile joy.
When the young Mozart was four years old, his father, hardly in earnest, taught him a few easy minutes and simple lessons, each of which he learnt in about half an hour. In less than two years more appeared the first dawn of his talent for composition; he invented short pieces of music, which his father noted down; but it is to be regretted that not one of these curiosities was preserved. That great sensibility which almost invariably is a concomitant of genius, and which never forsook him, was apparent from the moment he took up a pen. "Do you love me?" was a question he frequently put to those about him; and when he was ironically answered in the negative, his tears began to flow. In all his pursuits his ardour was extraordinary. While learning the elements of arithmetic, the size of the numbers, he wrote in the margins the marks of his calculations. And it may not be irrelevant to state, says the author of the Memoir in The Gallery of Portraits, "what we believe has never yet appeared in print—that his talent for the science of numbers was only inferior to that of music; had he not been the progressive genius of a higher order, it is probable that his calculating powers would have been sufficiently remarkable to bring him into general notice."

Not long after he had completed his sixth year, the child extended the range of his education by his father by the production of a harpsichord concerto, methodically and correctly written, and wholly unobjectionable, except that it contained too many difficult passages. The appearance of such a phenomenon (for as such it could only have been viewed) determined his father in order to prevent the intrusion beyond the limits of the German courts. He first took him to Munich, where the elector received him and his family with every kind of encouragement. In 1762 the party proceeded to Vienna, and performed in the presence of the elector. It was with less pleasure by the vivacity of the boy than amazed by his powers. In the following year the Mozart family made an extensive European tour: in Paris they resided many months, where the youthful wonder performed on the organ of the Chapelle Royale. In 1764, when he was seven, he wrote aNobody, in the Chapel of the Château of Rambouillet, where he gave music to some of the German courts. He first took him to Munich, where the elector received him and his family with every kind of encouragement. In 1762 the party proceeded to Vienna, and performed in the presence of the elector. It was with less pleasure by the vivacity of the boy than amazed by his powers. In the following year the Mozart family made an extensive European tour: in Paris they resided many months, where the youthful wonder performed on the organ of the Chapelle Royale. In 1764, when he was seven, he wrote a Nobody, in the Chapel of the Château of Rambouillet, where he gave music to some of the German courts.

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duction of *Don Giovanni* at the King's Theatre, which put ten thousand pounds into the lessee's pocket, and forms an era in the history of the opera. The work was composed by an Italian cabal, but that for the courage and perseverance of the director of that season, it would have been put aside, even after all the expense of getting up and trouble of rehearsing that. The overture was composed in 1799; *Die Zauberflöte* (The Magic Flute) in 1791, for M. Schickaneder, the proprietor of a theatre in the suburbs of Vienna, who himself wrote the almost incomprehensible libretto; and *La Clemenza di Titano* (Clemency of Titus or Titus's Best Intentions in Drama) in the same year, for the coronation of Leopold II.

Had Mozart's life been extended but a few years longer, he would have repeated his visit to this country. When the spirited and liberal Salomon engaged Haydn to write symphonies for his concerts, and to repair to London, in order to superintend their first performance, it was settled that Mozart should succeed his illustrious friend the following year, an agreement which death alone prevented from being carried into effect.

Of Mozart's symphonies, quintets, quartets, sonatas, &c., —of his masses, motets, detached vocal pieces, and many other works—we cannot afford space for even a bare list. His additional accompaniments to *The Messiah*, which exhibit the opulence of effect, are still in vogue, and withal such respect for a composer whom he considered the greatest that had ever lived, prove that it is possible to decorate the lily and add fragrance to the violet. They were written for the Baron von Swieten in 1788; and we may venture to foretell that this magnificent piece of work never again will be heard unattended by these invaluable contributions of a congenial spirit.

The last, and, taken as a whole, the most sublime work of Mozart, his *Requiem*, was written on his death-bed; and having been left for his use, it is an indubitable proof of minor details, his pupil, Süssmayr, filled up some of the accompaniments. This led, a few years ago, to a dispute concerning its authorship, an indiscreet friend of the latter having claimed as Süssmayr's composition the best parts of the whole. The orchestration was reviewed and commented on, and the arguments in its favour, proved unavailing against the convincing evidence afforded by the work itself, and the controversy can never be successfully renewed. A story too that an anonymous mysterious stranger commissi-

The bestowing on Mozart so abundant a share of genius and such exquisite sensibility, Nature seems to have thought that she had been sufficiently bountiful. Physical strength she denied him: small in stature, slight in construction, and feeble in constitution, he was not calculated to reach every peak of life. He was, however, gradually declined, though his imagination continued in full vigour to the last, and an attack of fever, prevalence at the time in Vienna, hastened his dissolution, which took place on the 5th December, 1792. He left a widow and two sons: one of the latter adopted his father's profession, and is, we believe, still living, but inherits more of his parent's goodness of heart than of his talent. The other is in the employment of the Austrian government, at Milan. Mad. Mozart, at the expiration of many years, entered again into the management of the theatre of Baron von Swieten. It has been said of Mozart that his knowledge was bounded by his art, and that, detached from this, he was little better than a nonentity. That his thoughts were almost without direction; that his music was not a matter of choice, but of necessity. Had not his ill-remunerated labours occupied nearly all his time, his means would have been still more limited than they were, for a salary of less than a hundred pounds from the imperial court was all the permanent in connection with his professional service. But his talent was greater than is generally supposed, in proof of which we have the best authority for saying,—we quote again, and with an unanswerable right, from the before-mentioned memoir—that once at a court masque given at Vienna, Mozart appeared as a physician, and wrote prescriptions in Latin, French, Italian, and German, in which not only an acquaintance with the several languages was shown, but a discernment of character and considerable wit. As thus (communicated to us by the late Mr. Attwood, his pupil and companion on the occasion) to be true, he could not have been a very ignorant man, nor always a small one. But still stronger evidence in favour of his understanding may be derived from his works. That he who, in his operas, adapted his music with such felicity to the different persons of the drama—who re- minded one almost of a personal poet—why were those who coloured so faithfully—where music is so expressive, that without the aid of words it is almost sufficient to render the scene intelligible—that such a man should not have been endowed with a high order of intellect is hardly to be believed; but that his understanding should have been below mediocrity is incredible.'

**MUCIUS.** [JUSTINIAN'S LEGISLATION.]

MUCUS. The recent researches of Dr. Henle of Berlin (Unter Schlesien und Estern Bildung, in Hufeland's Journal, der praktizten, 1835), have determined the true constitution of this substance, which had previously presented many quantities that appeared anomalous. He has proved that it is composed of the scales or cells of the epithelium, which covers all the open cavities of the body (Membrana Mucosa), separated and suspended in a considerable quantity of watery fluid.

The epithelium, or cuticular covering of all mucous membranes, consists of one or more layers of minute cells; and the spaces between these cells and the other portions of the membranes, cavities, but is continued into all the canals and ducts of glands that open on the mucous membranes. In different situations the form of the epithelium cells varies considerably; in some parts they are rounded, or polygonal and irregularly divided, but do not adhere to each other by their adjacent edges; in others they have a cylindrical or conical form, and are only attached to the mucous membrane by one of their extremities; in others they have also a cylindrical or conical form, and their free margins are bent in such a way that we might call it a partial vellum.

By the contact of the foreign matters to which all the mucous membranes are exposed in the performance of their functions, or by other processes, the epithelium cells are constantly being removed, and their place is as constantly supplied by new ones. Epithelium being a layer of cells, all the epithelium cells either floating separately or united into small membranous flocculi. Its chief chemical properties are that it mixes with any quantity of water without being dissolved, but swelling up and forming flocculi, does not dissolve in alcohol, and is not coagulated by heat.

The mucus is subject to various alterations by disease. In some cases, the epithelium, remaining healthy, is separated in a distinct membrane, as the cuticle is from the skin in blisters, by violence, &c. The quantity formed is also subject to great variation, and in many cases the structure of the cells composing it is altered. By these changes in the quantity, as well as in the composition and form, either of the watery secretion, or of the epithelium-cells, which are separated from each other by a watery membrane of this class are produced. Thus all catarrhs, dysenteries, &c., consist essentially of a disease of the mucous membrane, which, instead of secreting the quantity and kind of epithelium sufficient for its protection from the substances that irritate it, secretes an unnatural quantity of watery albuminous fluid with epithelium cells of variously altered forms.

**MUDAR. [CALOTROPIS.]

**MUDSTONE.** Local Name for part of the Upper Slinburnian, or of Mr. Murchison.

**MUEZZINN,** in Mohammedan countries, is the general appellation of those officers or clerks of the mosques whose duty it is to cry out from the minaret gallery the ezan, or invitation to prayer, at the five canonical hours, namely, at


dawn, at noon, at four o'clock in the afternoon, at sunset, and at night-close. The muezzin cry is a substitute for bells, which are not used in Mohammedan countries. The words of the exclamation are:—'God is great; I attest that there is no other God but God: I attest that Mohammed is the prophet of God: he comes to prayers; he comes to the temple of salvation: God is great; there is no God but God.' Each of these sentences is repeated several times in succession, with much intensity. The whole length of the muezzin's call is occasionally shrill tone, forming a solemn though wild melody, peculiarly impressive, especially when suddenly breaking upon the silence of the night. On hearing the muezzin's call, the devout Musalmans turn their faces toward Mecca and face the minarets, and repeat their evening prayers, among which are three short recitations, each recitation being repeated three times.

MUFFLE, a vaulted flat-bottomed earthen vessel in which substances may be strongly heated, and at the same time protected from the contact of the fuel; in this smaller vessels are placed containing the substances to be acted upon.

MUFFT, the general denomination of the head doctors of the law in Turkey, of whom there is one in every large town. The mufti of Constantinople is the highest in rank, and has a jurisdiction over the muftis of the provinces, and also over the whole body of the ulama, or lawyers. He is styled sheikh ul islam, or 'chief of the elect,' and is consulted in important matters of law. He is appointed by the sultan, who can also depose him. His decisions, called 'fetwahas,' are binding as one to the body of the law, and his judgments are final. His secretary, called fetwah emir, has an office with about twenty clerks for the despatch of business. The dignity of sheikh ul islam is one of the principal in the empire, and is equal in rank to the vizier, the grand vizier. Mouradja d'Ossanian, in his 'Tableau de l'Empire Ottoman,' gives several specimens of the 'fetwahas.'

MUGGLETONIANS, a sect of Christians which arose in England in the eighteenth century. The two sects of this sect are: (1) the Muggletonians, a journeyman tailor, and John Reeve, who asserted that they had been appointed by an audible voice from God, as the last and greatest prophet of Jesus Christ, that they were the two witnesses mentioned in the Apocalypse of the Revelations, and that they had power to bless or damn to all eternity whomsoever they pleased. They published a great number of works, and obtained many followers. The chief writers against them were the Quakers, and among these, George Fox and William Penn. On the 17th of December, 1677, Muggleton was brought before Old Bailey, and convicted of blasphemy. He died on the 14th of March, 1697, at the age of 88.

It is impossible here to give a full account of the strange doctrines of this sect. The chief articles of their belief appear to be these: that God has the nature and attributes of a mother; that the Trinity is only a variety of names of God, that God himself came down to earth, and was born as a man and suffered death, and that during this time Elias was his representative, and John the Baptist held a very singular and not very intelligible doctrines concerning angels and devils. According to them the soul of man is inseparably united with the body, with which it dies and will rise again.

A complete collection of the works of Reeve and Muggleton, together with other Muggletonian tracts, was published by some of their modern followers, in 3 vols. 4to, 1832.

Among the works written against them are the following: The 'New Witnesses proved Old Heretics,' by William Penn, 4to, 1673; 'A True Representation of the Absurd and Obscure Doctrines of the Sect of the Followers of Muggleton, known by the name of Muggletonians,' 4to, London, 1694.

MUGLILDE (or fishes of the Mullet tribe), a family of fishes of the order Acanthopterygii. This family may be distinguished by the following characteristics; in the male, scales nearly equal; dorsal fins (two in number) separated, the first with only four spinous rays; the ventral fins have their origin a little behind the line of the pectorals; branchiostegous rays, six. The head is somewhat depressed, and, in many species, when the body, is somewhat lenticular; the scales are polygonal plates; the muzzle is very short; the mouth is transverse, and when closed forms an angle, the lower jaw having an eminence in the middle, which fits into a corresponding hollow in the upper; teeth very minute; pharyngeal teeth not developed.

The grey mullet (Mugil capito, Cuvier), a fish not uncommon on many parts of the British coast, will serve to illustrate this group. It is rather more than one foot in length: the length of the head, compared with that of the body and tail, is as one to four; the greatest depth of the body, which is beneath the first dorsal, is about one-fourth of the whole length of the body; the head is depressed, snout rounded; the skin of the anterior and posterior margins of the orbit does not advance over the eye; first dorsal fin commences about the middle of the body, and is as high as, if not higher than, the length of its own; the forepart of the first dorsal fin is occasionally trilobed; the second dorsal fin is more than twice as long as the first; the third dorsal fin is the longest, generally as long as the body; the tail is short, rounded; the pectoral fins are very long, slightly rounded at the tip, and sometimes much divided; the pelvic fins are long and curved, the anal fins are somewhat divided in the inner rays, the caudal fin is triangular, with a short upper lobe and a long lower lobe. The colour is a dark grey or a coppery brown, with a dark spot on the base of the pectoral fin.

The thick-lipped grey mullet (Mugil chelo, Cuvier), according to Mr. Couch's MSS, communicated to Mr. Yarrell, seems to be abundant on the coast of Cornwall, but no other British naturalists appear to have noticed it. It is distinguished from the common grey mullet chiefly by its large and fleshy lips, the margins of which are ciliated; the teeth resemble hairs; the maxillary bone curved, and showing itself behind the commissure.

A third species of mullet is added to the list by Mr. Yarrell, who proposed for it the specific name of carus, from its comparatively short form. The length of the head, as compared with that of the body and tail, is as one to three, the proportion in the common grey mullet is greater; the length of the body is at least equal to its height, as in M. capito, being equal to the length of the head: the head is wider, the form of it more triangular, and also more pointed anteriorly; the eyes larger in proportion; the ray longer, particularly those of the tail; the ventral fins placed nearer the pectoral, and a differential exists in the number of some of the fin rays: the colours of the species are nearly alike; and in other respects, except those named, they do not differ materially. (Yarrell's British fishes.) Mr. Yarrell has caught this new species at the mouth of Poole harbour.

MÜHLHAUSEN, in France. [Mülhausen.]

MÜHLHAUSEN, the capital of a circle of the same name, in the government of Erfurt, in Prussian Saxony, is in 51° 13' N. lat. and 10° 28' 45" E. long. It is situated in a very pleasant country on the banks of the Unnbb. It is here joined by the Schwemmke, which flows through the town. It is surrounded with walls and ditches, has four gates, and consists of the upper and the lower town and four suburbs. There are four Lutheran churches, of which that built by the Elector Palatine Maximilian of Austria and dedicated to St. Blasius are worthy of notice. Among the charitable institutions are an infirmary, three hospitals, and an orphan asylum. The town possesses a gymnasium, numerous parochial and other schools, a society for the promotion of science, commerce, and art, and other institutions. The population is nearly 12,000. The manufactures of woollen cloth, serge, calicoes, leather, snuff, and tobacco, are very considerable. The breweries, distilleries, and tanneries are flourishing. Large quantities of starch, glue, and oil are made here. There are likewise draying-houses and fulling-mills, and the manufacturers of the neighbouring district of Eichsfeld send their woollens to Mühlhausen to be fullled, dyed, and prepared for the market. The inhabitants carry on a very great trade in their own manufactures and in corn. Mühlhausen was one of the oldest free cities in Germany; it boasted of having enjoyed its liberty from time immemorial, and preserved its democratical form of government till 1807, when the town and territory were assigned to Prussia, and finally incorporated with the canton of Jena.

MULBERRY. The black or common mulberry is the fruit of Morus nigra, the only species of Morus worthy of being cultivated as a fruit-tree. It is a native of Persia, and its indigenous range appears to be extensive. Its introduction to the United States dates from the sixteenth century. Under great vicissitudes it proves very tenacious of life; and under ordinary circumstances it attains, even in this climate, a considerable age, for some trees planted in it in 1773 are still standing at the desert, fresh gathered, and at the same time it ought to be so ripe as to be just ready to drop from the tree; indeed the fruit may be said to be in the highest perfection with regard to ripeness when it actually drops, and hence a grass plot surrounding the trunk is desirable; but the trees
are found to thrive better when the soil is kept stiered; however, as grass will be generally preferred, all strong-growing sorts of grasses should be avoided; and it should also be kept very moist immediately before the fruit ripens. By this means the sun's rays will be permitted to penetrate the soil to a greater depth than when obstructed by a covering of long grass. Mulberries are also preserved in the form of a syrup; and their juice, mixed with vinegar, forms a beverage of a deep portwine colour, called mulberry cider.

The soil for mulberry-trees should be of a light, rich, and moderately dry nature. If the subsoil be not naturally pervious, it should be rendered as much so as is possible.

The pruning of the branches and shoots should be done with the greatest care, so as to leave the tree in the best possible state for bearing fruit. The pruning of the branches should be done with the greatest care, so as to leave the tree in the best possible state for bearing fruit.

The mulberry is a very desirable tree, the following directions for obtaining a bearing tree and quickly will be useful. If a tolerably large branch of a vigorous tree is selected, and the pruning done carefully, it will be found that the tree will bear well, and that the fruit will be of good quality.

The mulberry-trees require very little pruning beyond that of regulating the heading. The season for this operation should be early in the spring, and the pruning should be done carefully, so as to leave the tree in the best possible state for bearing fruit.

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logist whose opinion we have just quoted. Professor Owen, for instance, in one of his valuable notes on another part of this very paper, truly observes that John Hunter's assertion that the fertility of a hybrid with an individual of a pure bread proves the fact of identity of two supposed distinct species equally with the production of offspring from the connection of hybrid with hybrid, cannot be admitted. "To prove the identity of two supposed distinct species," continues Page, "we must have seen the offspring of these breads from the two to be the proof required, it should be shown that such hybrids are fertile in some degree, and capable of propagating indefinitely an intermediate variety. Now that we are not in possession of such facts as are adduced in the text. All that Hunter proves is that two species very nearly related to each other will produce a hybrid offspring, and that the hybrid is again productive with an individual of the pure breed; but this only illustrates the general law by which the reversion of the hybrid to the pure breed is provided for; while, on the other hand, the intermixture of the distinct species is guarded against by the aversion of the individuals composing them to a sexual union. And it is no contradiction to this general rule to show that in some instances this aversion is overborne, as in the case of the lion and tigress — to cite an example, among the Carnivora [Lion, vol. xiv., p. 35], and in that of the pheasant and common fowl; and the hen canary-bird with the goldfinch, linnet, &c., among birds. [Canary-Bird, vol. vi., p. 228.] Such cases are the exceptions, and prove the generality of the rule or law.

Without there must be a concurrence of predisposing accidents to bring different species, in their anxious desire to propagate offshoots of their race, into the presence of each other, and the presence of such predisposing causes may be generally traced in most of these erratic alliances. In the great majority of them the species thus mingled are very nearly alike in every other respect of importance. Thus there is a record of the Hooded Crow (Corvus cornix) pairing and producing offspring with the Carrion Crow (Corvus corone); the male of Montagu's Harrier (Circus pygmeus) and a Ringtail (Circus cyaneus) having been shot at the nest feeding their young with the same material, and the pairing of a Blackbird and a Thrush in Lancashire: these birds reared their broods, which were strongly marked hybrids, for two successive years. (Magazine of Nat. Hist., vol. vii.)

Mr. Farrar, who, in his beautifully illustrated and interesting 'History of British Birds,' now in course of publication, mentions the last-named cases in detail, adds that several instances are known in which the female of the Black Grouse, usually called the Grey Hen, has bred in a wild state, and that the bird is monogamous or monandrous, represented in the title-page of Mr. T. C. Eyton's 'History of the Rarer British Birds.' [Black Grouse, vol. iv., p. 483.] The last-named ornithologist has also recorded the fruitful pairing of a Hen of the Black Grouse (Lophotilus Chascard), and the Hon. Twisleton's Finnes communicated to the Zoological Society of London an instance of the Common Wild Duck breeding with the male Pintail (and see further Ducks, vol. ix., pp. 181, 182).

The author of the 'History of British Birds' on above quoted has had so much experience on this intricate subject, so far as it relates to birds, that the following observations by him are worthy of all attention:

'Several experiments on the productive powers of various hybrid animals have been made. The breeders, in anticipating the interesting particulars which may be elicited, may briefly refer to what has fallen under my own observation. Some degree of restriction, either accidental or imposed, and arising from various causes, appears to be necessary in birds that are to breed between different species; but the influence of the divine command to "increase and multiply" is so irresistible, that some birds unite with strange partners, rather than have no partner at all; when putting a hybrid animal in a close cage with another wild bird of the same kind, the union is less likely to take place if they are kept within sight or hearing of other birds of their own species. The two sexes of the broods produced by such unions take little or no notice of each other. In the course of the breeding season, and are believed to be unproductive among themselves if so restricted; but if allowed an opportunity of uniting with the true species of either parent, they are then prolific, and the young birds produced soon lose all intermediate character.' (Hist. Brit. Birds, part xii.)

Our limits will not permit us further to pursue the zoological part of this subject, one of the most interesting that can be presented to the practical breeder or to the phy biologist, who will anxiously expect the results of the experiments above alluded to by Mr. Farrar.

MULHAUSEN, a town in France, in the department of Haut Rhin, situated on the banks of the Ill, a feeder of the Rhine, in 47° 45' N. lat. and 7° 21' E. long., 337 miles in a direct line east-south-east of Paris, or 278 miles by the road through Troyes, Besanzon, Belfort, and Albertville.

This town derived its origin and its name from a house and a mill established on the Ill by the friars hermits of the order of St. Augustine. In the eighth century it is noticed as a village, and from 1268 it ranked as a free imperial city. It was long time harassed by the bands of Alase, whose attacks induced the townsman to ally themselves, in 1466, with the Swiss Cantons of Berne and Soleure, in 1506 with Basel, and in 1515 with the whole Helvetic Confederacy, of which it may be considered to have become a member. Those alliances procured to the townsman peace and security; and Mulhausen, with its small territory, though surrounded on every side by France, preserved its separate existence till a.d. 1792, when it was incorporated with the French republic. It has ever since remained incorporated.

Mulhausen is divided into the old and new towns. The old town is built on an island formed by the Ill, which here flows in several channels, and is crossed by a number of bridges. The new town, on the other hand, is crooked indeed, but tolerably broad and well paved, and with well-built houses. There is a Catholic and a Protestant church, a town-hall, and a high school. The new town, to the south-east of the old town, is on the right bank of the Ill; the streets are clean, provided with foot-paths, and adorned with handsome houses.

The population of the commune of Mulhausen at the commencement of the century was 6628; in 1831 it had increased to 13,300, of whom 13,187 were in the town. The town includes the religious communes of Vauries, Le Dirlet, and the Ille, and it extends from the town to the neighbouring communes to follow their several employments. It is the centre of the trade of the department, and of the manufacture of printed cloths and silks, so much esteemed for their brilliant and fast colors, a manufacture which employs, in this and the neighbouring districts, nearly 80,000 persons. There are manufactures of cotton and woollen yarn, of excellent muslins, and other cloths, of fine and ordinary woollen cloths, of cotton goods, silk, straw hats, straw caps, and other articles. The houses, ten-yards, metal-foundries, and establishments for making steam-engines and other machinery. A commercial gazette is published. There are four yearly fairs.

The Canal de Monsieur, which unites the navigation of the Rhine and the Ill, passes through the town; there is a large basin for boats in the new town.

MULINIA, Mr. Gray's name for a genus of conchifers, allied to Muraena, having the ligament, properly so called, internal, and the lateral teeth simple.

MULL, an island on the western coast of Scotland, in the sound and county of Arrigh, comprised between 56° 16' and 54° 40' N. lat., and 4° 45' and 6° 23' W. long. Its length from north to south is 30 miles, and the greatest width, from Treasaig on the west to the bay of Auchagarry, is 23 miles. To the north the island is bounded by Loch Sunart and the headland of Ardmurchar, to the south by Loch Linnhe, and to the west by the Minah channel. On the north-east it is separated from the mainland by a narrow strait called the Sea of Mull, and the coast is indented by numerous lochs and bays. Of the former the principal is Loch-na-Keal on the western side, which enters so far inland that its extremity is separated from the Sound of Mull by an isthmus only two miles in width, through which the sea and the River Lochaline, whose mouth forms the harbour of Kilninian, and the southern the parishes of Kilfinich and Torosay. At the entrance of this loch are a number of small islands, including Ulva, the fair isle, and a group of small basaltic cave mounds. The island terminates to the south-west in a headland called Rossay, or the Ross of Mull, a short distance off which is Iona. (Torna.) The substance of the island is principally trap rock. The highest
MÜLLER. [Regiomontanus.]

MÜLLER, OTTO FRIDERIC, a Danish naturalist, born at Copenhagen, March 11, 1730. His parents were poor; but being fond of literary pursuits, and of studious and regular habits, he obtained in 1753 an appointment as tutor to a daughter of Count Schelin. In this situation he had ample opportunities for cultivating his taste for reading and for the observation of nature. It is said that the countess de Schelin, his pupil’s mother, who was a woman of great ability, persuaded Müller to devote his talents to natural history; for we find that previously to this time his principal study had been theology. Botany seems to have engaged his attention (though he owes his celebrity to his zoological researches), and he employed his leisure time in the study of plants, and in the drawings of that subject. He subsequently travelled for a considerable time in different countries with his pupil, and so greatly extended his knowledge of natural history, that on his return to Copenhagen, in 1767, he was a first-rate botanist and zoologist. Müller “has since” resigned all his professional engagements, and devoted the remainder of his life to the pursuit of science.

In 1763 he published a work on fungi, in Danish, which was followed by a history, in Latin, of the habitats of insects and plants inhabiting that part of the country in which he resided. It was written in Latin, and entitled “Fauna Insectorum Friedrichsaliana,” 8vo, Leipzig, 1764; and “Flora Friedrichsaliana,” 8vo, Stralsund, 1767. These works showed much method, and great accuracy in the investigation of specific characters, which qualities procured him considerable reputation; and he had the honor of being appointed to continue the publication of the “Flora” of Denmark, a superb work, undertaken by the command of King Frederick VI, who was a great patron of science. It had been commenced in 1741 by George Christian Oeder, who brought out three volumes. Müller added two others, the last of which appeared in 1754.

Müller now took more interest in the study of minute animals than of plants, and he published in 1771 a Geän, in Latin, entitled “Carentula, or Salt Water,” 1 vol. 4to, Copenhagen. Here particularly he described those annelidous animals which Limneus had called Aphrodites and Nerides, whose reproductive powers he observed by Bonnet, possesso so much interest. Müller added many new species, besides adding much interesting information concerning their structure and habits. He displayed greater powers of observation in the next work which he published, in Latin, named “Vermium Terrestre-um et Fossilium Insectum, Testacea et Testacearum non Marinorum, succincta Historia,” 2 vol. 4to, Copenhagen and Leipzig, 1773-74. The first part is devoted to the infusion animals, of which he discovered a great many new species. He was the first naturalist who attempted to arrange these minute animals into genera and species, assigning to each distinctive characters. The second part of this work contains some interesting observations on intestinal worms; and the third, which fills the third and fourth volumes, is devoted to the description of many new species. In this latter the author attempted to classify according to the organization of the animals inhabiting the shells; but as Cuvier has remarked, their structure was too little known at the time, and Müller was not enough of a comparative naturalist to approximate knowledge of the Floras and genera. The third part of this work is devoted to the Hydrachnæ in Aquis Danis Palustribus describit, 4to. Leipzig, 1781, and on the Entomaster, &c. (little shellled crustaceans inhabiting fresh water which were comprised by Limneus in the genus Mysidea). 4to. Leipzig, 1783. Here are monographs of several genera, and they are both written in Latin, and are accompanied with a great number of plates. Müller here described a vast number of animals whose existence was previously scarcely suspected, though they are contained by millions in all fresh waters.

In the subject in which he took the greatest interest was the microscopic investigation of infusional animals. He worked at this incessantly, and at his death (which took place on the 26th of December, 1784) he left a history and detailed description of this class of minute animals, illustrated with 50 plates. This work was published in 1786, by his friend Otho Fabricius, in 4to. (Hannin): it is written in Latin. These three works, on the Infusoria, Mysidea, and Infusoria, have procured for Müller a place in the first rank of those naturalists who have embraced science with original observations. He classified each of these families of animals, and his arrangement remains unaltered for many years, partly owing to the great care and exactitude with which he formed his conclusions. In consequence of the many difficulties with which the investigation of these microscopic animals is surrounded, the Infusoria were a new kingdom of animals which he recognized to the naturalist, and previously to the modern researches of Ehrenberg his labours stood alone in this branch of science. [Infusoria.]
it will form a complete history of Switzerland. Heeren wrote a biographical notice of Müller, Leipzig, 1809.

MÜLLER, WILHELM, a modern German writer and lyric poet of great talent, was born at Dessau, Oct. 7th, 1804. More ardent and industries than methodical in his studies, he nevertheless avoided a mere declamatory course of reading. He applied himself more particularly to ancient German literature and poetry, the fruits of his researches into which were first given to the public in his 'Romances of the Highest Ages.' His next production of any note was a translation of Marlowe's 'Faustus' [MARLOWE], in 1818, which was succeeded by his 'Rom, Römer, und Römerinnen,' 2 vols., 1820, a graphic and clever sketch of the papal capital and its inhabitants, the result of a tour which he made in Italy with Baron von Sack, and which he designed to extend into Greece. His literary reputation was afterwards greatly increased by his 'Gedichte aus den hinterlassenen Papieren eines reisenden Waldhöhnstei,' and his 'Lieder der Griechen.' The latter breathe a very high spirit of enthusiasm; nor is the beauty and melody of the language inferior to the energy of the sentiments. Many tales and other productions of that class by him appeared in the 'Urnus' and other literary annuals; and he also contributed several articles to Erckmann and Chatrier's 'Encyclopædia.' He died, October 1, 1827.

MULLERIA. [OSTRACAE.] MULLET. [HERALDRY.] MULLING. [SCOTLAND, W. INDIAN.] MULLION (by some supposed to be a corruption of muniment, from the Latin munimentum, to defend or strengthen, or else to be derived from the French moulure, a moulding), a term in Gothic architecture applied to the upright bars, or pinnacles, over the heads of the panes of a window. It passes into secondary openings, which are again subdivided vertically by a similar shaft crossing the mullions horizontally, and therefore called a transom; whereby the whole space beneath the head of a window (supposing it to be an arch) is formed of mullions set in a zigzag, in the glass of which is fixed, and which are sometimes technically distinguished as lights or days. Except in very small windows not exceeding in width one such light or compartment, mullions invariably occur in Gothic windows, and this is a proof of the necessity of fixing over each small single one: consequently the number of the mullions depends upon the width of the window. Two-mullioned and three-mullioned windows are the most usual in ecclesiastical architecture, and perhaps more common than single small ones. In churches, or windows of nearly equal dimensions in other buildings. In these they are frequently very numerous; that, for instance, in the façade of York Cathedral is divided into eight lights or compartments by seven mullions, while that above the gate it may be a Gothic arch with eight mullions. Again the former of these is untranslated, but the other is translated, being divided in its height to the spring of the arch into two tiers of archheaded compartments; it also affords an instance of what is by no means uncommon, namely, of principal and subordinate mullions, being divided by two larger mullions into three leading compartments, each of which contains three smaller ones. The lesser or simple mullions, sometimes described as those of the first order, consist of the principal and the transom, or the heads of the compartments are foiled; while the larger ones have additional moulidings. In explanation of this we may refer to the window from Kirton Church, at page 324, GOTHIC ARCHITECTURE, where the central mullion is larger than the others. Foils are of course intended on the sides, and we have only those that form the cusps. As far as they go, the other specimens of windows given in that article will further exemplify the subject of mullions, and serve to render it evident that in whatever design it would be improper that their heads should be filled with tracery.

After what has been said, it is hardly necessary to insist upon the importance of mullions, without which a window would be Gothic only in name, and filled with glass. Neither is it sufficient that there be mull

VOL. XV.—3 P.
lions, if they have not the character suitable to the style. Modern architects are apt to be too negligent in this respect, and to make their mouldings too poor and meagre, a defect for which no merit in other parts can atone, since the whole will have an air of dryness and insipidity, and there will be little, if any, of that relief and vigour which antique example promises: the spirit of the style is lost. There is indeed no express rule for determining their proportions, yet no one who knows anything of the style, or has feeling for it, can be at a loss. The breadth of the mouldings should never be less than one-fourth of the width of the intermouldings or lights between them; and in many examples they are more than one-third. It is also important that they should have projection or depth as well as breadth, that is, the glazed surface of the window should recede considerably from the line of the outer face of the mullion. Unless this be attended to, there will be more or less a deficiency of that spirit, boldness, and richness depending upon such particulars of execution, let the outline of a design for a window be ever so good. When, as is now frequently the case in modern churches, the windows are glazed with ground glass, a greater rather than a less degree of boldness in the mouldings is requisite, in order to produce that relief which the semi-opaque surface of the glass tends to diminish. It is the neglect of such apparently trifling matters that causes the prodigious difference between modern churches and the originals, which almost every one feels, though few can explain.

Subjoined are the horizontal sections or plans of two mouldings; one of the simpler and usual form, the other of a more complicated nature, which might be called a moulding of a moulding; but both of them, as it is invariably the case, agrees in coming nearly to a point externally, presenting there merely a narrow face or fillet. Each moulding exhibits also some variation of the same general form, in its darker and lighter tinted sides. The cut further instances the spacing of the mouldings, which are here not quite three times their own width apart.

It will be seen that the depth of mouldings, or their thickness through their external and internal face, is greater than their width. In the second of the two here shown, the depth is double the width.

The letters s g indicate the line of the glazing of the window; and h and f, the sill.

MULTINOMIAL. [POLYNOMIAL.]

MULTIPLE, SUBMULTIPLE, MULTIPLICATION.

Any number of equal magnitudes added together give a multiple of any one among them. Thus 4 + 4 + 4, or 12, is a multiple of 4. And submultiple is the inverse term to multiple; thus 12 being a multiple of 4, 4 is a submultiple of 12. The term submultiple is equivalent to ALIQUOT.

The derivation of the word is from multi-plex, mani-fold, and multiplication, and is the process of forming a multiple. Thus one yard by 279 times is 279 yards, and to obtain all the results together. And this is the first and fundamental meaning of multiplication. Its usual symbol is ×; thus 4 × 3 is 12.

If we look at the primary rules of arithmetic, we shall see that multiplication is the only one which cannot be entirely performed upon concrete quantities. To or from 100 yards 50 yards can be added or subtracted, and 100 yards can be divided by 50 yards; but 100 yards cannot be multiplied by 50 yards. The very definition of multiplication requires then that each has to be multiplied by 1, or that their products are a number, abstract or concrete, to be repeated; and this number of times or repetitions cannot be a number of anything else. Thus to talk of multiplying 10 feet by 7 feet is a contradiction in terms; if it means that 10 feet is to be multiplied by 7, or that 7 repetitions of 10 feet are to be made, 10 is multiplied seven times, not seven-feet times. But if it be meant that 10 feet is to be repeated so as often as 7 feet contains one foot, the question has three data, and belongs to a class which will be considered in PROPORTION; it is in fact a question of multiplication in which the number of repetitions is not given, but is to be extracted from the result of a question in division. On this subject see also RECTANGLE.

It being now distinctly understood that a number of times or repetitions is an essential element of multiplication, the extension and system of which, by a fraction of a time, or a fraction of a repetition, is allowed to enter Thus 12 ÷ 12 + 12 + 6 is 12 repeated three times and half a time, or 12 multiplied by 31/2. Similarly 2 + 2 ÷ 8 + 8 + 8 or 8 ÷ 21 is taken 8 times. Upon this point there is no violation of etymology; the multiplicant (same term as the denominator, number to be multiplied by) is taken manifold times. But [Numbers] by the same sort of extension of language by which 1, and even 0, are called numbers, the more familiar result in multiplication and multiplying it by one is 7 is taken once, or 7 multiplied by 1, though, etymologically, multiplication does not take place. Again, when the half of a number is taken, or when it is taken half a time, it is said to be multiplied by 4; and so on for any other fractional system of multiples and their products in practice more than counterbalances its obvious defect, namely, that the beginner must, without great care, be confounded by the application of a word in a sense diametrically opposed to its literal meaning.

The general process of multiplication rests upon the following principles. (1.) If the parts of a number be multiplied, and the results added together, the whole is multiplied; thus 8, composed of 13 and 5, is taken 17 times by taking 13 and 5 each 7 times, and adding their results. (2.) Multiple of the parts by the product of any number, and addition of the results, is equivalent to multiplication by the whole; thus 13 taken 7 times and 8 times gives two products, the sum of which is taken 7 + 8 or 15 times. (3.) Successive multiplication by two numbers is equivalent to one multiplication by the product of these two numbers; thus 7 taken 3 times, and the result taken 4 times, is taken as many times as there are units in 4 times 1, or 12 times. (4.) If one number be multiplied by another, the result is the same if the multiplication is changed; thus 7 times 8 is the same thing as 8 times 7. (5.) In the decimal system, the annexing of one cipher multiplies by 10, of two ciphers by 100, &c.

The application of these principles requires that, in the decimal notation, the process of multiplication of all simple digits up to 9 times 9 should be remembered: this is usually done by learning what is called the multiplication table, and this table, which is only absolutely necessary up to 9 times 9, is usually committed to memory up to 12 times. Thus being supposed to be done, we shall now show the process of multiplying 1234 by 5073. By (2.) (2) we must take 1234, 5073 times, 70 times, and 3 times, and add the results. To take 1234, 3 times, we subdivide it into 1000, 200, 34, and 8 each of which taken 3 times, and the results added together, gives 3702.

<table>
<thead>
<tr>
<th>1234</th>
<th>5073</th>
</tr>
</thead>
<tbody>
<tr>
<td>6000</td>
<td>0</td>
</tr>
<tr>
<td>1200</td>
<td>0</td>
</tr>
<tr>
<td>3702</td>
<td>0</td>
</tr>
</tbody>
</table>

Similarly 1234 taken 5000 times, gives 6.178,000. Now we have the three results together, and add them; which gives the first column following.

| 86380 | 0 |
| 617000 | 0 |
| 6256082 | 0 |
| 6256088 | 0 |

The whole process is

| 86380 | 0 |
| 617000 | 0 |
| 6256082 | 0 |
| 6256088 | 0 |

86380
617000
6256082
6256088

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The second column shows the usual manner of performing the operation, which we suppose the reader to know. We have given the preceding detail so that he may do what he has never done before; compare the common process with the deduction of the result from first principles.

There are several abbreviations of multiplication which are very useful, but which are not commonly taught.

1. Five times is half of ten times: to multiply by 5 annex a cipher and divide by 2: thus 76753 X 5 is most easily done as follows:

\[ 767530 \]

\[ 383915 \]

2. Nine times is one less than ten times, so that 76783 X 9 can be found as follows:

\[ 767830 \]

\[ 691847 \]

This may be done best by subtracting every figure of the multiplicand from the preceding, carrying and borrowing where necessary, in the usual way, on the supposition that the first figure is to be subtracted from ten. Thus the process of multiplying 27293 by 9 is as follows:

\[ 27293 \]

\[ 245637 \]

3 from 10, 7, carry 1; and 9 is 10, 10 from 13, 3, carry 1; and 2 is 3, 3 from 9, 6; 7 from 12, 5, carry 1; and 1 and 2 is 3, 3 from 7, 4; 0 from 3, 2.

3. Eleven times is one more than ten times; so that the addition corresponding to the preceding subtraction must be made. Thus to multiply 62781 by 11, proceed as follows:

\[ 62781 \]

\[ 690591 \]

Let 1 remain; 1 and 8 is 9; 8 and 7 is 15, carry 1; 1 and 7 is 8 and 2 are 10, carry 1; and 2 and 3 is 6 and 6 are 12; 6 and 0 is 6.

4. To multiply by any number from 12 to 19 inclusive, multiply by the last digit, and add to the carrying figure, and the carrying figure of the product of the multiplicand which is just done with. Thus

\[ 2734 \]

\[ 17 \]

\[ 46478 \]

7 times 4 is 28, carry 2, adding 4, or carry 6; \[ 7 \times 4 = 28 \]

7 is 5 + 2 or 3; 5 is 24 and 5 is 54, carry 5 + 7 or 12; 7 is 2 and 14 is 12, carry 2 + 2 or 4.

5. To multiply by 25, annex two ciphers and divide by 4: to multiply by 125 annex three ciphers and divide by 8.

6. In multiplying by a number of two figures, ending with 7 or 8, as 68, it may be advisable to take the multiplicand 70 times, and subtract it twice, in preference to taking it 60 times, and adding it 8 times.

The following rules are taken from the ‘Risala Hisab,’ (Taylor’s Littuatiu, Introduction, p. 17.) The first at least can easily be done without paper.

1. To multiply two numbers together, each of which is between 11 and 19: to the whole of one number add the units of the other; ten times this, together with the product of the units’ places, is the product required. Thus, 17 times 14 is 24 times 10 and 283. 2. To multiply two numbers together, each of which has only two places: to the whole of one factor, multiplied by the tens of the other, add the tens of that factor multiplied by the units of the other; ten times the result, together with the product of the units, is the product required. Thus 76 X 38 is done as follows: 76 X 3 is 228, which, increased by 7 X 8, or 56, is 284, and 2840 increased by 48 is 2888, the answer required.

The multiplication of sums of money is facilitated by a process known by the name of Paccrucs. The multiplication of fractions offers no difficulty when the extension of the word multiplication, already described, is understood and admitted. For instance, when we have to multiply \( \frac{1}{2} \) by \( \frac{1}{2} \), or to take \( \frac{1}{2} \) elevenths of a time, we see that \( 1 \) being \( \frac{1}{2} = \frac{1}{2} \), one-eleventh of this is \( \frac{1}{2} \) and \( \frac{1}{2} \) elevenths is \( \frac{1}{2} \) whence the rule commonly given, namely, multiply the numerators together for a numerator, and the denominators for a denominator. In the multiplication of one decimal fraction by another, as 123 by 018, the multiplication of the numerators gives 123 X 18, or 2214, and that of the denominators 100 X 1000, or 100000. But a decimal fraction which has 100 or 1000 for its denominator has as many places as there are in both of the others together, whose denominators are 100 and 1000. From this consideration we may see that the common rule immediately follows.

For a mechanical contrivance for expediting multiplication, see NAPIER’S ROPES.

MULTIPLE POINTS. When two or more branches of a curve pass through the same point, it is called a multiple point; and this, whether the branches touch or cut one another. When two or more branches intersect, it is obvious that as many distinct tangents may be drawn at a multiple point as there are branches which there intersect, that is, for one value of the abscissa the differential coefficient of the ordinate may have more values than one. In most cases such points are so rare that this happens may be ascertained by inspection of the equation of the curve. Thus in

\[ y = (x - b) \sqrt{(x-a) + c(x-a)} \]

\[ dy \]

\[ dx \]

we see that \( y \) in general, has two values, and so has \( \frac{dy}{dx} \); to each value of the former belongs one of the latter. But in the single case of \( x = b \), both values of \( y \) become equal, or \( y \) has only one value; while \( \frac{dy}{dx} \) has the two values

\[ + \sqrt{(b-a)} \]

and \[ - \sqrt{(b-a)} \]. There is then a multiple point when \( x = b \) and \( y = c \); and as two branches cut one another, it is called a double point. Similarly, had there been three, four, &c. branches, it would have been called a triple, quadruple, &c. point.

It is not worth while to enter here on the general method of determining double, &c. points. (See Lib. Usef. Kn., ‘Differential Calculus,’ p. 182.)

MULTIPLICATION. [Multiple, &c.]

MULTIVALVES, the name formerly used to designate those shells which were made up of more than two pieces. Thus the Cerithoidea (Lepas) were all multivalve shells of Limmusus, and so were Chiton and Pholas.

MULWIA. [Marocco.]

MUMMUS, I. [Cominth.]

MUMMY is a name derived from an Arabic word mum, signifying wax, and which is now applied not only to those dead bodies of men and animals, in the preparation of which wax or some similar material was used, but to all those which are by any means preserved in a dry state from the process of putrefaction.

The art of embalming, by which the greater part of the mummies now existing were prepared, was practised, with more skill than has ever since been acquired, by the inhabitants of ancient Egypt, of whom whole generations still remain preserved from decay in the vast hypogaea or catacombs in the neighbourhood of Thebes and the other great cities of that country.

The most authentic description of the Egyptian method of embalming is that given by Herodotus (ii. 86). In Egypt, he tells us, ‘there are men who professedly exercise this art. When a corpse is brought to them, they show the bearers of it wooden models of bodies, painted in imitation of the members of the dead body, with the face of the deceased, with the name of his, whose name I will not in such a case mention. They exhibit also a second model, inferior to the first, and cheaper than it; and a third, the cheapest of all. After this explanation, they ask the bearers of the dead body, after which they are to be prepared, and they, having agreed upon the price, depart. The embalmers proceed for the most expensive plan in the following manner. First, with a curved iron they extract the brain through the nostrils, partly by pulling it out, and partly by pouring drugs in. Then with a sharp Egyptian stone they cut the body in the flank, and through this aperture they take out all the viscera, which they wash with palm wine, and clean with powdered aromatics. They then fill the belly with the purest powdered myrrh and cassia, and other perfumes (frankincense excepted), and sew up the wound. In the next place they cover the body with natrum (a mixture of...
carbonate, sulphate, and muriate of soda), and bury it in the same material for seventy days, a longer period not being allowed. When the seventy days are passed, they wash the body and envelop it in bandages of fine linen covered with gum. The relatives, on receiving the body, take it to the mummy case made in the form of a man, in which they place it, and having shut it up, they put it in a sepulchral building, setting it upright against the wall.

'Those who would avoid the heavy expense of this method of embalming, have the bodies thus prepared:—they fill several receptacles with sesame oil, without either cutting into the abdomen or removing the viscera; then preventing the effusion of the injected fluid, they salt the body for the fixed number of days, and at the end of that time let out the sesame oil, the power of which is such that it brings out from the body all the intestines and the contents of the intestines, it cleanses the flesh, and the skin and the bones only of the corpse remain. This being done, they return the body. The third mode of preparation is that with which the bodies of the poor are treated. They wash out the abdomen with a cleaning liquid, put it for seventy days in natrum, and then return it to the relatives.'

To this account Diodorus Siculus (Biblioth. Hist., lib. i., cap. 91) and some others, while generally confirming it, add a few unimportant particulars, and of which much it has been subjected to severe criticism from various commentators, yet the researches of those whose authority is next in importance, the members of the Institute who accompanied Napoleon in his Egyptian campaign, have proved that as far as goes the question, the basis of the process is in truth not so prodigious as it has been thought. The results of these researches, in which MM. Jomard, Rouyer, and Larrey were chiefly engaged, are contained in the great work, 'Description de l'Egypte.' Those of M. Rouyer especially illustrate the process of embalming. He found that the bodies of which he was in search were preserved in different classes of mummies; those in which an incision had been made above the groin, and those in which there was no such opening. In both the brain had in general been extracted by breaking through the roof of the nose, or muzzle, and not by any means taking its proper place; but a few unusual aperture in the skull, and the brain had been left in it, a fact which is confirmed by the examination of some of the mummies that have been brought to England. (Petitgrew, History of Egyptian Mummies.)

Among the mummies which have an incision in the flank (and which are probably the bodies of the rich, in whom that measure was necessary for the complete cleansing of the interior), M. Rouyer distinguishes those which were filled with sesame oil and aromatic substances, and those in which, in addition to these means, were salted.

Of both these kinds some are filled with a mixture of aromatic resins, and others with asphalturn or pure bitumen. The mummies which are filled with sesame oil and aromatic substances are generally olive-coloured. Their skin is dry, flexible, and like tanned leather, and contracted. Their features are distinct, and appear to be like those that existed in life. The resins which all their cavities contain are dry, light, brittle, and aromatic. The teeth, hair, and, eye-brows are generally perfect. Some of them are gilded all over the body, or on the most prominent parts.

The mummys which are filled with bitumen are reddish; their skins are hard and polished as if they had been varnished, very heavy, inodorous, and difficult to unroll; their features are but slightly altered; the hard black resinous substance with which they are filled possesses little odor, and they are scarcely alterable by exposure to air.

Those which have been salted, as well as thus prepared, differ little in their general appearance from those just described; but they are usually less perfect, the features being altered, and their hair having commonly fallen off. The body is covered and enclosed in the air, a process of efflorescence forms upon them, which consists of different salts of soda. The intestines and other visceras, which in all these kinds of mummys were removed through the aperture in the flank, after being washed with palm wine and sprinkled with aromatics, were usually placed in an earthen vessel, and then, with prayer for the pardon of the sins in eating and drinking into which they had led their possessor, were thrown into the river; but sometimes, after being thus cleansed, they were returned into the abdomen, or were preserved in a separate vase by the side of the body.

The edges of the incision in the flank are always found placed in simple contact, not sewed together as Herodotus mentions.

Among the Egyptian mummys which have not had the viscera removed by opening the abdomen, M. Rouyer distinguishes two kinds; in one of which the bodies had been salted, and then filled with an impure kind of bitumen (pissaphatt.), while in the other they had only been salted and dried. M. Rouyer thinks that instead of the viscera being destroyed, as Herodotus mentions, by oil of cedar, which has putrefied, and left corrosive matter, a jet of soda was first injected, and that afterwards, when it had destroyed the viscera, the cavities were washed out with the oil of cedar. The mummys which, after having had their viscera thus removed, were filled with bitumens, are, finally, the poorest of all the mummys, and they preserve none of their features. Not only are all the cavities filled with the pissaphatt., but the surface of the body is covered with it, and it has so completely penetrated all the tissues, that the whole form of them is lost. It is probable therefore that this material was injected very hot, and that the bodies were plunged into a vessel containing it in a state of fusion. It is an impure, grey, and strongly smelling substance, less black and brittle than the bitumen which has been thus putrefied. It is long regarded as a valuable medicine for wounds and bruises, and in the sixteenth and part of the seventeenth centuries a considerable trade was carried on in it by a number of Jews, who sold it as 'balm of mummys.'

Thus, the mummys of the poor, the so-called salted and dried are even less perfect than the preceding. Their features are entirely destroyed; all their hair is fallen off; and the body and the bandages by which it is enveloped fall as pieces when brought to the air, or may very easily be broken up. In most of these mummys there were twenty or more bandages; they are hard, dry, and whitish, like dirty parchment.

The bandaging, to which all the Egyptian mummys were subjected, was one of the most remarkable parts of the process. Their envelopes are composed of numerous bandages, which they put on at different times, not over fifteen or twenty times, and surrounding first each limb, and then the whole body. They are applied and interwoven so accurately, that one might suppose they were intended to retain the body in a dry shrunken form, as long as they were hard, dry, and whitish, like dirty parchment.

The body is first covered by a narrow dress, laced at the back and tied at the throat, or it is all enveloped in one large bandage. The head is covered by a square piece of very fine linen, of which the centre forms a kind of case, for the whole head, the other the cheeks, the hair is put one over the other, and the last is usually painted or gilded in representation of the embalmed person. Every part of the body is then separately enveloped with several bandages impregnated with resin. The legs extended side ways, and the arms crossed over the chest, are fixed by bandages which surround the whole body; and these last which are commonly covered with hieroglyphs, are tied by long, crossing, and very ingeniously applied bands which completely the envelope. Most of the body is divided into two kinds, or at most five, bandages which are placed in this state in the catacombs; those of the rich only as enclosed in cases. The cases are usually double, the interior being composed of boards made of several portions of linen glued together, and the exterior cut from a piece of hard oak wood.

The Egyptians practised embalming almost as extensively on some animals which they deemed sacred as men. The list of the mummys of animals which M. Petitgrew gives includes the monkey, bat, dog, cat, lion, wolf, ape, bear, hogs, swine, goats, sheep, oxen and calves, hippopotamus, vulture, eagle, falcon, hawk, owl, ibis, goose, swallow, crocodile, lizard, snake, adder, cerastes, carpe, pipe, and some other fish, and a few species of insects. Some vegetables also have been occasionally found, the best known of which are those some which had sepulchres appropriated to their species, but occasionally they are mixed, and very rarely they are found in the coffins of human mummys. The most frequent mode of preparation was by burning ou the viscera by the introduction of a fluid, and salting them, and then bandaging them like the
human bodies. The ibis and the hawk however usually received more care, and were prepared with resin and asphalt. After being embalmed, each bird was usually placed in a separate vessel.

The Egyptian mode of embalming was imitation occasionally by the Jews, Greeks, Romans, and other nations, and has sometimes been adopted in modern times, but never to the same extent or perfection as they attained. The only other nation to have a similar national custom was that practised by the Guanchees, the antient inhabitants of the Canary Isles. [CANARY ISLES.]

Their mummies are particularly described by M. Bory de St. Vincent, in his Essai sur les Isles Canaries. Numerous mummies, well filled with them in each of the thirteen islands, but the best known is one in Teneriffe, which contained upwards of a thousand bodies. The mummies are sewn up in goat or sheep skins, and five or six are commonly joined together, the skin over the head of one being stitched to that over the feet of another; but those of the great are contained in cases hollowed out of a piece of savine wood. The bodies are not bandaged, and are dry, light, taw-coloured, and slightly aromatic. Some are incompletely preserved, with distinct though contracted features.

The method of embalming adopted by the Guanchees consisted in removing the viscera, in either of the same ways as the Egyptians practised, then filling the cavities with aromatic substances, then wrapping them in a very fine tissue, and lastly drying the body very carefully for fifteen or sixteen days in the sun, or by a stove. So complete is the dessication of these mummies, that a whole body which Blumenbach possessed weighed only 74 pounds, though the dried skin weighs 86 pounds. In the Gabinio collections, there are two of the same size as usually prepared weighs at least 9 pounds.

In some situations the conditions of the soil and atmosphere, by the rapidity with which they permit the drying of the animal tissues to be effected, are no less efficient to the preservation of the body in the form of a mummy. This is the case in some parts of Peru, especially at Arica, where considerable numbers of bodies have been found quite dry, in pits dug in a saline dry soil. There is a splendid specimen of a mummy, described in the Gazeta de Europa, which was brought from Caxamarca by General Paredon. Like most of them, it is in a sitting posture, with the knees almost touching the chin, and the hands by the sides of the face. It is quite dry and hard; the features are distorted, but nearly perfect, and the hair has fallen off. The Peruvian mummies do not appear to have been subjected to any particular preparation, the dry and absorbent earth in which they are placed being sufficient to prevent them from putrefying. Humboldt found in the Peruvian deserts, on former fields of battle, dried and preserved in the open air. In the deserts of Africa the preservation of the body is secured by burying it in the hot sand; and even in Europe soils are sometimes so arid that they undergo a slow process of drying, and then remain almost unalterable even on exposure to the air and moisture. There is a vault at Toulouse in which a vast number of bodies that had been buried were found, after many years, dry, and without a trace of the effects of putrefaction; and in the vultures of St. Michael's church, Dublin, the bodies are similarly preserved. In both cases putrefaction is prevented by the constant absorption of the moisture from the atmosphere, and through its medium from the body, by the calcium oxide, which acts both as a dehydrator and as a preservative. It is not necessary here to consider the various means which are now employed for the preservation of the animal tissues, both for stores of food and for museums of anatomy and natural history, as they are very rarely applied to the works of man or beast which forms the most essential part of the preparation of a mummy, the process of drying. If European climates were more favourable, it is probable that, with the present knowledge of materials for hardening the tissues, such as the various resins and asphaltum, the best of the Egyptian, &c., mummies might be prepared equal even to the Egyptian in permanence, and superior to them in the preservation of their forms. [Petitgrew, Hist. of Egypt; Mummies; Library of Entertaining Knowledge.]

MUMPS, an inflammation of the parotid, and often, at the same time, of the other salivary glands, of contagious or epidemic origin. The inflammation, and the fever by which it is accompanied, generally increase for about four days, then begin to subside; and after four days more, to such an extent, that the patient becomes quite well. There is a tendency to metastasis, that is, to pass suddenly from the organ first affected to some other. The treatment required is very simple; quietude, abstinence, seclusion from cold, the application of poultries or other warm substances, or, in severe cases, the use of the swelling, are all the means that are usually necessary.

MÜNCHHAUSEN, ADOLPHUS, BARON, born in Hanover in 1688, studied at Jena, Halle, and Utrecht, and afterwards filled several important official stations in the electorate. He was an active agent in founding the university of Göttingen, of which he was the first president; and in this situation he held till his death. He devoted himself with great assiduity and zeal to the advancement of that institution, which rose under his care to a high rank among the universities of Germany. He established the chairs of geography, literary history, and political science; and improved the system of teaching philosophy and theology, by doing away with the old scholastic methods. Heyne says that Münnchhausen introduced into the university freedom of thinking, feeling and writing. He was also the founder of the Royal Society of Sciences of Göttingen. He increased the library of the university from 10,000 to 60,000 volumes, which number afterwards, while Heyne was librarian, was brought up to 200,000. All these things were done by Münnchhausen's own industry and labour, and by his activity, judgment, and perseverance. More ample particulars of what Münnchhausen effected for the benefit of the university of Göttingen are given in the Quarterly Journal of Education, No. XX.; in Heyne's Oratio inauguralis in honor of Professor G. F. W. von Lessing, delivered in the 2nd volume of his 'Opuscula Academica,' and in his other oration on the same subject delivered before the Royal Society of Sciences of Göttingen, inserted in the second volume of his 'Novi Commentarii de metallis Gottingensis,' and also in Heeren's 'Life of Heyne.'

Münnchhausen was for many years privy-councillor to the elector of Hanover, George II. of Great Britain, and in the latter years of his life was appointed first minister, by his successor, for the electorate of Hanover, which situation he filled to the general satisfaction, though only for a short time. He died at Hanover, in 1770.

MUNDA. [Cæsar, C. J., p. 124.]

MUNDLEYSH. [Hindustan, vol. xii., p. 211.]

MUNNPOOR, a country in Asia, east of the British possessions on the Ganges, extends between 23° 45' and 25° 30' N. lat. and 93° and 94° 30' E. long. Its northern boundary-line is ill defined, but is generally assumed to be formed by the high range of mountains which, extending into a north-easterly direction, form the northern boundary of the valley of the Brahmapoora. From the British possessions on the west it is divided by the course of the river Barak between the mouths of its two tributaries, the Chikoo, which met in the Brahmapoora, and the Leeree, which joins it from the north, and by the course of these two last-mentioned rivers. Along its southern boundary extends a mountain-region inhabited by several independent tribes belonging to the Nagas or Kookeens. On the east it is divided from the valley of Kubo and other districts annexed to the Birman empire, by a chain of mountains called the Muring range. According to the estimate of Captain Pemberton, the known portion of Munnepoor occupies an area of 10,000 square miles, of which a valley, or water plain, of 636 square miles forms the central portion. This plain is encircled on all sides by a zone of hilly and mountainous country, inhabited by various tribes, subject to Munnepoor.

The valley, which comprises by far the most valuable portion of the country, is divided into 2500 feet above the sea. Its extreme length is about 36 miles, and its average breadth about 18. In its whole extent it is covered with a deep alluvium of great fertility, and consists of two gently inclined plains, meeting in a line which forms the course of the Moolar river. Numerous small detached groups of hills appear in various parts of the valley, above which they rise from 500 to 600 feet; and to the east of the antient town of Munnepoor is a range, whose central peak, called Nongpoe, reaching it, is the highest part of the country above the sea. The valley itself is perfectly free from forests, but every village is surrounded by a groove of fruit-trees. Nearly the whole of the central portion consists of a series
of jheels and marshes, which retain water all the year round, and furnish extensive pasture-ground for cattle and horses. The villages are built upon the edges of the slopes connecting the bases of the mountains with the valley, or on the banks of the Imphal Toorel, which is generally from 50 to 100 feet below. The range of mountains which forms the western barrier of the valley is more elevated and extensive than any other between Silhet in Bengal and the western boundary of the Birman empire; it runs in a direction nearly south-south-west, for about 35° 30' E. longitude, from the extreme southern limits of the Muneepoo valley, where it gradually declines, and at length terminates in a series of broken and rugged heights. It slopes gradually into the valley by a succession of lower hills. But on the western side of it, there is not yet a tolerable level. The sides of the range throw off of numerous precipitous ridges, whose upper portions are too steep to admit cultivation, which is consequently limited to the lowest part of their declivities. On this side it is an almost unbroken mass of magnificent primrose forest and luxuriant vegetation, whilst the western face of the range, which fronts the valley, has been almost entirely cleared, and is annually cultivated with rice and cotton by the Nagas. The elevation of the principal range varies from 5000 to 6000 feet above the sea.

The Muring range, which bounds the valley on the east, is less extensive and elevated. Its extreme length is about 50 miles, and its eastern declivity is the more precipitous. It is united with the valley by a gentle slope. Its elevation varies from 6730 to 5980 feet above the sea. The range lies within the limits of Muneepoo, but the valleys beyond it belong mostly to the Birman empire; the most important and extensive is that of Kobo. On the north and south the valley is not enclosed by a continuous range, but by a prolongation of the northern and southern branches of the range which issue from two extensive mountain-tracts which lie in that direction; the northern has been explored very imperfectly and the southern not at all by Europeans. The northern is immediately connected with the mountains of the CHINA range, which extend into the valley of Assam; and the southern seems to constitute the most north-eastern extremity of the Yeomadong range or Arakan mountains, which, separating Arakan from Birma, terminate with Cape Negrais (16° N. lat.). The ridges which separate it from the valley of the river are, likewise, separated by narrow defiles, through which a small stream generally flows.

The principal river of the vale of Muneepoo is the Imphal Toorel, which rises in two principal branches in the mountain-region lying north of the vale; the eastern is called the Ereri, and the western the Khongba river. The latter, which is the principal branch, unites with the Ereri two miles south of Langthabal, near 24° 40' N. lat. Ten miles south of Ereri, and joined by the Imphal Toorel, which likewise descends in a southern direction from the northern mountain-region. The Imphal Toorel traverses the centre of the vale in a southern direction, and enters the southern mountain-region at the village of Slogonouoo, near 24° 15' N. lat. Its course in this region is not known, but it is said to form a tremendous fall, which is very probable, as the difference of level between the vale of Muneepoo and the low lands of Kulu amounts to more than 1500 feet. This difference of level must be overcome either by a rapid succession of 70 to 80 feet, or over two small drops of 500 feet each. After leaving the mountain-region at 22° 35' N. lat., it enters the plain of Kulu, belonging to Birma, where it is called Nankath Khyoung, and after receiving the united waters of the Hyetsha and Man rivers, which flow from the north, it suddenly turns north by a bold bend and flows in that direction for about 35 miles, when it bends east, and traversing the Uongohing hills, enters the Ningtha or Kuentuen river, the great tributary of the Irrawaddy. The whole course of the river is only about 540 miles. The river is usually navigable except during the rainy season, it is only navigable for small skiffs formed of a single tree, which are the only description of boats used in Muneepoo. During the floods it flows with a velocity of five or six miles an hour, and has a depth of 20 to 30 feet, owing to its contracted channel; but if the season is more than usually wet, the waters rush over the banks, and convert all the central portions of the vale into a vast swamp.

At about 24° 30' N. lat., the Imphal Toorel is joined by the Korethu river, or the outlet of the lake Logta, which is about four miles long and two wide, and occupies the south-western corner of the vale. It is formed by numerous small streams descending from the western mountain range. Near its southern extremity there are three ranges of small islands; the central range, called Tangak hooket, is 478 feet above the level of the Thaoboo lake. The lake is inhabited by fishermen, and are particularly well adapted to the culture of fruit-trees. The lake furnishes twenty-six varieties of fish, eighteen common to the rivers of Bengal, and eight found in any of them.

The mountain-region south of Muneepoo, which lies to the west of the vale, and separates it from Cashar, is traversed by the Barak or Soormah river, an affluent of the Brahmapootra, or Megna, into which it falls near the village of Sunampon in Birman. The sources of the river are in a mountainous region which forms a natural mountain-range which lies between Muneepoo and Assam. It runs through Muneepoo in a south-south-western direction, and forms at the most south-western corner of the country a bend, by which its course is changed into a northern one. It flows north for about 50 miles, and here forms the boundary-line between Muneepoo and Cashar, up to the mouth of the Jeeer river. Its course through Muneepoo is upwards of 180 miles; but it is too rapid for navigation. It is only navigable above the mouth of the Jeeer river, where it becomes navigable for boats of any burden. The climate of the vale of Muneepoo is modified by its elevation above the sea and the mountains which surround it. In December and January the thermometer is at nearly 60° below zero, in the months of February and March the thermometer is 10° below zero during the night. In November and February the thermometer is at noon between 60° and 68°, and in June generally attains from 80° to 85°. The difference between the temperature of Muneepoo and Calcutta in water is about 2° in April, in December and February it is from 11 to 15 degrees; but in summer (June, July, and August) it ranges between 6 and 8 degrees. The quantity of rain is much less at Muneepoo than at Calcutta; but it is more than sufficient for the agricultural wants of the country. The mean annual quantity of rain at Muneepoo is 20 to 25 inches, but in summer at 30 to 50 inches. The rain falls on the slopes of the mountains surrounding the vale; the showers are more frequent than in the lower country; but the cold months, from November to February, when the showers become very frequent, and in the month of April the rains are sometimes more abundant than in other parts of the year. In May the rivers begin to rise, and continue to do so until the middle of October, when they again fall with remarkable rapidity. During their rise, which does not usually exceed 20 feet, until ten or eleven o'clock in the morning, the valley is enveloped in a dense fog, which, disintegrating, leaves a beautifully clear and cloudless atmosphere; but an hour after sunset the valley is covered with mist, and, very precipitated as dew, which, during the night, is changed into hoar-frost. The climate of Muneepoo is peculiarly favourable to the constitutions both of Europeans and the natives of Hindustan.

The agricultural produce of Muneepoo consists principally of rice, which forms the staple article of food, and the crops are everywhere very abundant, as the numerous streams which issue from the mountains surrounding the vale ensure an adequate irrigation even to the fields. In the vale of Muneepoo, sugar-cane, indigo, mustard, and different kinds of vegetables and opium, are also cultivated, and cotton in the valleys of the mountainous districts. In the gardens which surround the vale of Muneepoo, each hour vegetables are extensively cultivated, and since the termination of the Burman war, the Burman have introduced the vegetables of Europe, such as peas, potatoes, different varieties of greens and cabbages, carrots, radishes, beet-root and turnips; the two first have proved so acclimatized, that they now are almost universally cultivated. Fruits do not abound; they are few in number and limited to the apple, pear, and the smaller kind of peach, except pineapples, which are not inferior to any on the face of the globe, and the oranges grown on the islands of lake Logta. The other fruits are apples, pears, raspberries, strawberries, gooseberries, pomegranates, guava, mangages, and jack-fruit; but they are not abundant; the people being owing to want of care and skill in their cultivation. Silk is collected in considerable quantities in some villages on the northern borders of the vale.

In no part of India do the forests afford a greater variety
of excellent trees than those which cover the mountains surrounding the vale of Muneepoor. Cedar of gigantic size, fir, and pine, occupy the highest portions of the ranges; oak of very size occurs on the several hills and mountains, and is employed as fuel and building materials. Many other forest-trees, commonly found in countries in the latitude of Muneepoor, are abundant. The teak-tree however, and the keo, from which the celebrated Burmese varnish is derived, are overgrown on the south-eastern ranges, bordering on the vale of Kuchin. Burmese varnish is of very little use in a commercial point of view, as the nature of the country precludes the possibility of transporting the timber to foreign markets with any prospect of advantage.

The cattle of Muneepoor are buffaloes and cattle, more especially the latter. The buffaloes are much superior to those of Bengal. The horses are of a diminutive size, rarely attaining a height exceeding thirteen hands; but they are hardy, vigorous, and highly valued. Goats and sheep are to be seen in the plains of the mountains; the latter were lately introduced by British oficers. Elephants are frequently seen in the gins and defiles on the north of the vale; deer are abundant, and grow to a very considerable size. The wild hog is not less common, but the wild cat is scarce, and very rare. The cultivation has extended in the vale. A wild dog is found among the hills, where it hunts in packs. Fowls, ducks, geese, and pigeons are sufficiently numerous.

Gold is not found in Muneepoor, though it occurs in the Khen-dungh or salt-springs. The mica is very common in several parts, especially in the beds of small rivers south of Thobal and in the hills near Langthabal. This metal is worked and manufactured into axes, hoes and plough-hafts, spears, arrow-heads, and blades for daggers. No other metal is used as an article of traffic with the surrounding tribes, who barter for it their tobacco, ginger, cloth, and cotton.

Muneepooris, or inhabitants of the vale, appear to be the descendants of a Mongol colony, which in ancient times inhabited two bridges, one of the Chinese and the other of the Burmese, than the inhabitants of Bengal, being taller, stronger, and possessing a more vigorous mind than the latter. They have made considerable progress in the arts of civilization. They make several kinds of cotton and silk, and the children belong to the aristocratic and agricultural tribes as tharzis, for strength and the brilliancy of their colours, especially a kind of large scarfs, which sometimes are very richly embroidered, and then exported to Ava. Capt. Pemberton estimates the whole population at only 20,000 souls, and states that there are Roman Catholics, 5,767; atheists, 1,717; and Jews, 48. The number of illegitimate children known to be such in Munich is very great, and seems to be increasing, as appears from the following statement:

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The town of Muneepoor, which is nearly in the centre of the vale, was destroyed in the wars with the Burmese, and has not been rebuilt. The rajah of Muneepoor, who, since the peace of Yandabo (1826), is placed under the protection of the British government in India, resides in the village of Langthabal, near the union of the rivers Khonba and Eeri. There is no place in this country which carries on any commerce, but it will probably become the entrepot of an extensive trade, as the most easy route by land between Hindostan and the riches of China. Chinese merchants from Yunnan formerly advanced as far as Muneepoor in their commercial travels. The greatest difficulty which opposes such an extension of trade is the mountainous and hilly character of the vale. Though three roads traverse this tract, they pass from four to seven mountain-ranges within a space of between 80 and 90 miles, and can only be used during the dry season. The country between Muneepoor and China seems to offer fewer obstacles to the transport of merchandise.

(Pemberton's Report of the Eastern Frontier of British India; Ritter's Erdkunde von Asien, vol. v.)

MUNICH (in German, München), the capital of the kingdom of Bavaria, is situated on the left or west bank of the river Isar, in a basin between the dark hills and the light hills. It is in 4° 8' 19" N. lat. and 11° 35' 15" E. long. Munich, though it bears traces of its antiquity, is one of the handsomest towns in Germany. It has several broad straight streets, with lofty houses, in a good style, and some very good squares of oblong form, which are, in some, an obelisk 50 feet high, made of the metal of cannon taken from the enemy, and erected in 1833, in honour of 30,000 Bavarians who fall in the Russian campaign in 1812. The Max-Joseph-square is to be adorned with a colossal bronze statue of King Maximilian, which is in process of execution, and will probably be set up before this article is printed. Though not a place of strength, Munich is still surrounded with a rampart, and has seven gates leading to the suburbs, and 12 suburbs. St. Anne's church, in Maximilian, is 255 feet square; the Maximilian-vorstadt, Ludwigsvorstadt, and Schöpfeld; the last three are of modern date, and contain a great number of fine buildings. The largest suburb is the Au, lying beyond the two arms of the Isar, and connected with the old city by two bridges, one over the Au, 347 feet in length, and the other of wood, 700 feet long.

The population of Munich and the suburbs was, in 1815, 60,215. In 1824 it amounted to 66,125 without the garri- son; but including the garrison, with the 4,667 women and children, the 2,000 servants, and the 6,000 soldiers, with 3,475 inhabitants, the total was 74,067. Cannabich (1836) says that, according to the latest census, the total population, including the garrison, was 95,536. The latest account we have seen (1836) gives 96,718, of whom 72,117 were Catholics, 692 Lutherans, 627 Calvinists, 292 Jews, and 48 of various other sects.

The number of illegitimate children known to be such in Munich is very great, and seems to be increasing, as appears from the following statement:

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Some accounts of the last two or three years state the number of illegitimate births as equal to and even exceeding that of the legitimate; but such statements require to be supported by very good evidence.

Munich has numerous scientific and literary institutions, most of which are connected with the Old King Maximilian Joseph I. and the present king Ludwig; to the latter it is chiefly indebted for the magnificent buildings and inexhaustible treasures of ancient and modern art. The Royal Academy of Sciences was founded in 1669 by the empress Cæcilia Augusta, and has received from king Maximilian I. a new constitution and ample endowment, and was reorganised in 1827. A general conservator has under his care the public library of 400,000 volumes and 9,000 MSS., the Museum of Natural History, the Brazilian Museum, 500,000 specimens formed by Dr. Spiix and Dr. Martius (whose numerous and splendid works on Brazil and its natural history far surpass anything hitherto published in Germany), the Physcal, Mathematical, and Polytectic collections, the Botanic Garden, the Cabinet of Medals, the Antiquarium or Cabinet of Antiquities, the Chemical Laboratory, the Observa
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tory at Bogenhausen, &c. There are two gymnasia for the higher branches of education, the Royal Academy of Arts, the Military Academy, the Veterinary and Medical-Clinical Schools, the seminary for forming teachers, the Central Polytechnic School, and many others. The university was founded in June, 1472, at Ingolstadt, was transferred in 1800 to Landshut, and in 1827 to Munich. In 1835 it celebrated its 373rd anniversary, on which occasion the new regulations for students and professors were promulgated. There are 58 ordinary and 10 extraordinary professors, and between 1300 and 1400 students. The university is well furnished with all the necessary requisites, and has a library of 105,000 volumes. Besides many private schools, there are four state elementary and three boys' schools for girls of the lower classes, which are attended by about 6000 children; and Sunday-schools, chiefly for servants and work-people. The charitable institutions are numerous, and on a very liberal scale. Such are the general hospital, for 500 patients; St. Joseph's Hospital, for 260 patients, an asylum for the blind, and for the deaf and dumb; the military lazaretto, the poorhouse, the lunatic hospital, the lying-in hospital, and many others. The house of correction is considered as a model of its kind. It contains a manufactury of women's clothing. In all, the capital invested was worth 100,194 florins, and the gain of the 442 prisoners 36,467 florins (10 florins = 1/7 sterling). The successful exertions of Count Rumford for the suppression of mendicity at Munich are well known. His establishments for preparing and distributing economical soup still subsist.

The manufactures of Munich are of many different kinds, chiefly for the consumption of the city and neighbourhood: the buttons, ribbons, household furniture, piano-fortes, playing-cards, articles of gold and silver, coaches, excellent mathematical, surgical, optical, and astronomical instruments. Fraunhofer's (now Utschneider's) manufactury of astronomical and surgical instruments is celebrated throughout Europe. In 1824 it produced the great telescopes for the university of Dorpat, which is 160 Paris inches in length and 10 in diameter. There are likewise manufacturies of leather, stuff, and paper (the latter, established in 1347, is probably the oldest in Germany), and of various kinds of distilleries and distilling apparatus. But all these are on the whole of little importance, and the inhabitants owe their support chiefly to the numerous public establishments, the government offices, the expenditure of the court, and of the numerous landowners who reside in the city. Lithography was invented at Munich by M. Schenfelder.

The environs of the city are very pleasant, and contain numerous places of public resort and amusement, which are very much frequented. The English garden, a large park, last out of the ring of fortifications, is a favourite place of resort in summer. The river Isar flows through it, and has a neat bridge over it. In the vicinity are the royal country-seats of Nymphenburg and Schleissheim, both of which contain splendid manufacturies on the scale of the inhabitants. Munich is very fond of amusement: in the summer they enjoy the open air in the country; and in the winter, besides the carnival, frequent concerts and balls. There are likewise three theatres. Though Munich is so far south, the climate is by no means mild, in consequence of its elevation of 1385 feet above the level of the Adriatic and the vicinity of the mountains of the Tyrol. The changes of temperature are sudden, and injurious to health.

Within the last twenty years Munich has raised itself to the rank of a commercial city as a result of which distinction she is mainly indebted not to the patronage alone, but to the personal enthusiasm of the present sovereign Ludwig I. of Bavaria, in behalf of art. The number of public buildings erected within that comparatively short period far outstrips that of any other city in Europe, is astonishing, when the limited resources of such a small kingdom as Bavaria are taken into the account. Neither is it merely as buildings—sculpture and architecture alike, that these additions to the capital are worthy monuments of art; for painting and sculpture, fresco, and in some instances polychromy also, have been unsparingly employed to embellish them. The interiors of our British Museum and National Gallery are of quaker-like plainness in comparison with the halls of the Glyptothek and Pinakothek; nor have we anything whatever that can even com

very an idea of the frescoes of the Hof-Arkaden and the Allerheiligen Kapelle, or of the Ionic polychrome temple which is called the English Garden. It would in fact require not only a volume, but one vastly illuminated with engravings, to describe at all satisfactorily those edifices alone which have been erected and adorned within the brief space above mentioned, or which are still actually in progress. We shall therefore merely give some account of the principal. The first being one or two of the most remarkable of the older buildings.

The cathedral, or Frauenkirche, was begun by Duke Sigmund in 1468, and completed twenty years afterwards, is in a poor and mean style of Gothic, besides being extremely lofty. As the only ornament of the church, of which the author says, 'It is of red brick, fork-tailed at the extreme; without ornament, without general design, without either meaning or expression of any kind. The towers cannot be less than 350 feet in height, but the bells are mere pepper-boxes.' The edifice is therefore remarkable chiefly for its size, although its dimensions are by no means extraordinary, the length being 321 feet English, the greatest breadth 122, and the height to the summit of the vaulting of the nave 116. Neither does the interior or exterior of the church correspond with that of the smaller church which was erected in 1603-12, by Maximilian I., to the memory of his great-grandfather the emperor Lewis IV. The splendid workmanship, by which Deutsch has given any superiority of its kind throughout Europe, is of black marble and bronze, and was executed from the designs of Peter Candid, who also painted the principal altar-piece.

The next in point of antiquity is St. Salvator's, now the Greek church, on the river Leis, in Munich, in which the succession of dates, comes St. Michael's, or the Hohkirche, of which the first stone was laid April 11th, 1532, by Duke William V. It is 290 feet in length, and is in the form of a cross. The architect was Wolfgang Muller, and from what he has written on the subject, speaks he in the highest terms of praise. 'I can recollect nothing,' says he, 'to be put in competition with it as a comparatively modern edifice. The interior is, as to Roman architecture, that of St. Ouen is as to Gothic, although the latter is as considered, and the former is as beautiful. It is indeed the very charm of interior architecture.'

The church of St. Caietan, a work of the seventeenth century, which was founded by the electress Adelaide, and completed in 1672, was designed by an Italian architect, and conceives the appearance of a Bolognese church in that the nave is 120 in its greatest width, being in the form of a cross, and it has a central cupola raised on Corinthian columns. The façade however is of much later date than the rest, not by the architect himself, but by Jean Baptiste Mathey the elder. The designs of Couvillers, a Frenchman, Dibdin says of the church, that it is quite of the Italian school of art, and seems to be a St. Peter's at Rome in miniature—the façade beautiful and striking. Again, 'It is doubtful if one of the most courts, adorned with rich fountains and fountains, might be at the time when he visited Munich, in 1818, is no longer so. The present Allerheiligen Kapelle, Ludwigkirche, St. Bonifacius, did not then exist; nor, with the exception of the Glyptothek, which was merely in progress, not one of the many splendid new fabrics which adorn the Bavarian capital had even been commenced, as may be seen, by referring to our Table of Buildings. Neither did the building itself at that time contain Thewaldsen's magnificent work, the tomb of Eugène Beauharnais, the work of Antonio Canova, which is to me in some instances colossal figure of the ex-vice Impero, in which there are two beautiful genii, and a female representing the muse of History, while a portal of Grecian design forms a rich architectural background to the whole composition. The Triumphal Arch was begun in 1704, and is a rotunda with a cupola of eighteen Corinthian columns. The façade is of the Ionic order.

The Alt Residenz, or Old Palace, is a vast pile, and is to have been erected from the designs of Vaseri, by Maximilian I., at the close of the sixteenth century. The west front is about 550 feet in length, and has two noble Doric portals, ornamented with bronze statues. Within are three courts, a large hall, and a library. As while as to the interior itself, the storey of art of every description there treasured up almost exceeds credulity.
What is called the Schöne or Reiche Kapelle well deserves its lofty, being composed of and filled with the most costly materials; lapis lazuli, jasper, amethysts, gold, ivory, display themselves everywhere, even in the mosaic floor: in short, such is its marvelous gorgeousness that this single apartment is said to have cost Maximilian I. several millions of florins. To attempt to give any idea of the other contents of this palace and its numerous cabinets—of the works in painting, carving, bijouterie, &c. of which it is the repository, is here utterly impossible. Yet, vast as this pile before was, it has been prodigiously extended by two others, namely, the Neve Residenz (new palace), or Königsbau, and the Festbau, which may be considered as incorporated with it, and forming together with it one enormous mass of building, as is apparent from the accompanying situation's plan, comprising the whole of that extensive and varied group of architecture extending from the facade of the post-office to the old picture-gallery on the north side of the Hofgarten and that end of Ludwigstrasse.

The Königsbau (b b), begun in 1526, from the designs of the celebrated Leo von Klenze, adjoins the Old Palace at its south-west angle, and forms the north side of the Max-Joseph's Platz, the east and south sides of which are occupied by the theatre and post-office respectively; while the center is adorned with the splendid bronze monument of the late king Maximilian Joseph, a sitting colossal figure on a double pedestal, whose sides are covered with reliefs, and the lower one has the figure of a lion partly projecting from it at each angle. Of the Place the facade of the Königsbau, 406 feet in length, forms one entire and the side it is being somewhat narrower at the other end, or the side occupied by the Festgästehaus. Not only the style of the Königsbau, but the design itself, bears a strong resemblance to that of the Palazzo Pitti at Florence; more in fact than is at all desirable, because if noble and imposing, it is also too severe and monotonous, and by no means corresponds with or suggests the more refined style of decoration employed in the interior. The ground-floor and that above it have each twenty-three arches in one continued line, of which the centre ones below are larger than the others, and form open entrances to the loggia or carriage vestibule, as in the Strand front of Somerset House. The third story rises above the rest of the elevation, it being only eleven windows in length, and has therefore a balustraded terrace on each side of it, forming the flat roof above the remainder of the building, on which the bell-tower of the chapel resembles the original one at Florence. Closely however as the architect has followed his model for the most part, he has not scrupled to innovate upon it in some respects, since, having added a Doric colonnade on the ground-floor, he has introduced an order in pilasters in each of the upper ones; the first with Greek Corinthian capitals, the other with Roman.

After all, it is the interior of the Königsbau which has obtained for the building the popular name of the magnificent and classical taste displayed in its decorations, the extensive employment of fresco-painting and sculpture, and the high talent manifested in them by Schnorr, Zimmermann, Kaulbach, Schwantaler, and other artists, who have here had ample scope allowed them. Those who visit for any particulars respecting them, may be referred to the 'Visits and Sketches' of Mrs. Jameson, who has spoken of some of the apartments rather at length and with little warm of admiration. Unfortunately however there is one pervading defect unobserved, or at least unmentioned by her, and which, as far as the architect is concerned, detracts very materially from his praise, and from the merit of all the rest; which is, that there are no beauties of any kind in the plan, consequently nothing has in that respect been sacrificed for architectural effect, notwithstanding which, the arrangement is most inconvenient and faulty. In fact, it is decoration alone, rather than architecture, which here displays itself; but where profuse therefore may be due to nature, or the share we may have had in conceiving or suggesting, or even in designing much of the embellishment, he certainly has shown neither ability nor study in regard to anything else. The staircase on the east or king's side leads through two ante-rooms (whose walls are of scagliola in imitation of poli- loured marbles, with painted friezes, representing respectively the history of Orpheus and subjects from Hesiod's 'Theogony') into a saloon or reception-room 32 feet square, the walls and ceiling of which are adorned with a series of subjects from Homer, painted in fresco by Schnorr. The next in course is the throne room (39 ft. 6 in. by 33 ft. 4 in.), the walls of which are entirely covered with gildings, with the exception of the pilasters and mouldings, and decorated with arabesques in polished and chased gold, while the friezes by Schwantaler exhibit different subjects from Pindar. The gilding alone of this single room is said to have cost 72,000 florins. Here the rooms on this side may be said to terminate, further progress being interrupted by their majesties' private rooms, and beyond them may be approached from the staircase at the north-west angle of the building, which leads to nearly the same number of rooms terminating in the queen's throne-room and drawing-room, the former adorned with engravings by Kaulbach, of subjects from Klopstock. Another strange oversight in the plan is, that the dining-room (painted by Zimmermann with a series of subjects from Anacreon) is placed immediately behind the king's throne-room, in such a manner that the latter must be made use of as a passage-room to it. It cannot therefore be denied that the plan is positively bad; and even many more defects in it might be pointed out. The whole indeed seems to be fitted for nothing more than a series of rooms, and to be always open to free inspection, as a continuous gallery exhibiting a succession of stanzas; each appropriated to one set of wall-paintings and other decorations; and as far as concerns embellishment, each is in itself a study. It is impossible to particularise further, as we have already done, except merely to mention, that on the upper floor, forming the loftier part of the facade, there are apartments for entertainments, among which is a ball-room, 62 feet by 37, and 27 high, with semi-circular balconies surrounding it a balcony of flowers, 68 feet by 36, opening to the terrace over the east end of the building; and the four Nibelungen-säle (on the ground floor, at the west end of the front), so called from Schorn's magnificent frescoes, the subjects of which are taken from the celebrated German epic, the Nibelungen-Lied.

The second and later addition to the Residenz, which is also by Klenze, is what is called the Festbau (c c): it has a facade towards the Hofgarten (of which it extends along the south side about 800 feet in length). This Romanesque style,
with an Ionic colonnade in the centre, upon which are a series of allegorical figures by Schwanteile. The throne-
room is intended to be a continuation of this colonnade.
The Hofgarten (g) itself is a planted square of about 1100 feet from east to west, and 700 from north to
south. The west side may be considered the Palais Royal of Munich, it being lined throughout its whole extent by ar-
ced colonnades. The arcade, which begins at the east
portion, belongs to the Bazar; while that distinguished by
the name of the Hofarkaden (h) is decorated with a series of
sixteen frescoes by Sturmer, Förster, Zimmermann, Schül-
gen, Eberle, and other artists, illustrating as many events in
the history of the dynasty. This monumental and historical gallery, in as
well deserves to be called, was completed and opened to
public view, October 3, 1829. In continuation of the
Hofarkaden are the arcades of the bazar, where, in com-
parisons between the doors and windows, are two large
frescoes representing Italian views, all of which are by
Rottmann, who has here shown great ability as a
landscape-painter. The principal front of the bazar
itself (i), another of Kienzle's productions, faces the
Odeon-Platz, of which it forms the eastern side. It is in
a simple but tasteful style of Italian architecture, with en-
riched pannels between the larger arches of the ground-floor,
and grouped windows above, consisting of lesser arches,
whose archivolt rest upon Corinthian pilasters.
Almost opposite to the Hofgarten stands the old
picture gallery (l), arranged in a suite of rooms over
another lengthened arcade. The rooms themselves are
not well adapted for their purpose, being lighted by windows
on each side; but they are about the largest and most appropriate
for exhibiting collections of paintings in ivory, &c., and all the
choicest pictures will be deposited in the Pinakothek, as
will those from Schleissheim and the other royal
collections, the total number of which is not less than nine thou-
sand. The abundance of works of art in Munich is quite
prodigious, and that not in painting alone, but in sculpture,
as is testified by the Glyptotheca alone.

Though by the same architect (Kienzle), this last-men-
tioned museum of sculpture is very different in style from
that near, and is very much lower. Built to the right of the
Schaus, it bends the old picture gallery (l), arranged in a suite of rooms over
another lengthened arcade. The rooms themselves are
not well adapted for their purpose, being lighted by windows
on each side; but they are about the largest and most appropriate
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sand. The abundance of works of art in Munich is quite
prodigous, and that not in painting alone, but in sculpture,
as is testified by the Glyptotheca alone.

THROUGHOUT THE MUNICH:

A rich and interesting collection of works of art,

The building is at considerable distance from any others, standing with its south or principal
front towards a large open space called the Königsplatz. It is
more than about 220 feet square in plan, with a court in the centre; yet, although in point of magnitude it is by no
means remarkable, it is far more imposing in appear-
ance and of larger proportions than many edifices of面具
its size. Although this condition is more accentuated
her account of the Glyptotheca, Mrs. Jameson says little of the
façade, and that little is incorrect; for she describes it
as having a portico of twelve Ionic columns, raised on a
flight of steps; whereas the principal interest of the
templet is found in three very deep gradins, continued as
a base along the whole front, like those in some of the
antient Greek temples; while what is said as to the num-
ber of the columns, though correct in itself, is apt to lead
into a singular error as to their disposition, only eight of
the columns being in front and the others behind, in such
manner as to form a second range of four columns and four
ants, or seven intercolumns, five of which are open, and
the one between the two antas at each end closed up or
blank. Consequently it may be termed a compound of
portico and loggia, and might be described technically, both
clearly and briefly, as consisting of an Ionic octastyle pro-
jecting before a tetrasstyle in antis. [CIVIL ARCHITECTURE.

Hence there is a richness and intricacy of columnar
and a variety of light and shade, to which none of our por-
ticos make any pretension; nor can we refer to anything
at all similar, except it be the small but highly picturesque
architectural bit at the north-west angle of the Bank of Eng-
land in London, in which this portico differs very
nearly from that of the Post-Office or that of University College,
London; but it is of much loftier proportions than the
latter, and more classical in style and in intercommunication
than the former; besides which, while it rises, that of
University College is carried above the rest placed in a
greater degree, it is relatively much smaller than that on
or any other which we possess, for we have not one example in
which the portico itself is not small in comparison with the
mass to which it is attached. Another circumstance where-
in this portico differs far more markedly from anything of
our own, is the richness of its cornices and accrescences, and
more than all, the splendid display of sculpture in the
form of reliefs and medallion statues, and the recesses or hollowed so as to admit detached figures or sta-
tues, as was the case in the temple of Apis, and may be
seen in the models of its pendants at the British
Museum. The composition itself, intended to exhibit the various
operations of human life, and to be arranged in a manner to
adapt itself to the richly scored surface, was designed by Wagner, but the figures were executed
severally by Schwanteile, Loch, Haler, and others, as
were first put up in 1836. The six bronze colossal statues
for the three large tabernacle niches on each side of the
building are by Schrotter, and the others are divided among
the various prints, but free from any of the insignificant features which too often mar such edifices.
The interior is divided into a series of rooms, of which
the two rotundas at the angles of the place are lighted from
above, through lanterns and domes; the others by semi-
circular or lunette windows, opening on their cornices
and into the inner court. The first rooms, beginning with
those on the left hand, or west side of the vestabule, are
appropriated to Egyptian antiques and other works of
early art; these succeed the Jupiter Saal, and Ha-

droom was finished. South of the Scharz Hall is the
Niobiden Saal, which last is at the west angle of the
north front, and is lighted by one of the two windows
that side of the building. The space between that and the
other rooms, not appropriated to any particular purpose,
was the Saale, two large apartments whose walls are entirely covered
with frescoes by the celebrated Corinth and his pupil.

At the north-east, answering to the Niobiden Saal, is the
Heroen Saal, from which there is a descent into the Rappall or gallery. The spacious gallery, the rotunda at the south-east angle of the front, adjoining which is a hall
of modern sculpture, containing those two admirable
specimens, Canova's Paris and Thorwaldsen's Adam. The
room is the last of the suite, and brings the visitor again
out on to the terrace. Although this last-mentioned room does
not possess the same degree of variety, nor the same
order of domes, the forms, dimensions of the rooms, their doors,
windows, and ceilings, and their enriched pavements,

Munich: the work superseding remarks upon
the ancient sculptures here collected. For a catalogue
raisonné of the whole collection, we would recommend:
Schorn's 'Beschreibung der Glyptothek;' and for accu-
rate information as to the building itself, we refer our reader
to the plates of it in Kienzle's own Entwürfe, where, besides
plan, and various sections, &c., will be found the principal
ornamental details, and several interior views in outline.

The Pinakothek, or Pinacotheca, another, and as
respect the best of Kienzle's works, is a much more ornate
edifice than the Glyptothek, and altogether different
both in its plan and its style of architecture, although
it resembles it in being perfectly insulated, and
standing by itself, open on no very distant north-east from
the other buildings, and in the midst of a space
of the first importance. The first stone was laid Apr.
7th (Raphael's birthday), 1828, by the royal founder him-
self, and the building was completed in about ten years.
The completed plan, which is of the unqualified type,
serve greatly to abridge description, and to convey a con-
ception both of the form of the edifice and the arrangement
of the galleries.

Although each side of the building presents an architec-
tural aspect of uniform character, there is a marked dif-
ference may be considered the principal one. The lower part
consists of a very lofty ground-floor, with a series of arched
windows within square-headed framings, surrounded
by cornices, and resting upon a socle, or rather podium, formed
by two courses of large rustication.

In the centre of the main
that is because the loggia (marked mm in the plan) are eleven such windows on each side of the entrance portico, or rather porch, as it rises no higher than the ground-floor, which consists of four Ionic columns, whose entablature supports a balcony in front of the three central arcades or windows of the loggia above. Along the upper floor the same order is continued throughout in half-columns against the sides of the arches between them, which, although glazed, cannot be so as is thought from the view of the windows as one connected arcade. This order is crowned by a bold cantilever cornice and antefix, terminating the elevation; for the attic does not rise immediately over the order, but is set back as far as the hinder wall of the loggia. The projecting ends of the plan assist greatly, not only in giving an air of solidity as well as variety to the general mass, but also greater importance to the lateral façades. On the lower floor, at the west end of the building, is a library, and rooms for collections of prints and drawings. The rest consist of rooms required for the keeper and other officers of the establishment.

The upper floor is sufficiently explained by its plan. The larger rooms in the centre are lighted from above; and although the height to the top of their lanterns is rather more than fifty feet, this is sufficiently unnecessary loftiness, while it contributes greatly to architectural importance, and affords ample space for decoration above the cornice of the rooms (of which full advantage has been taken), also causes the light to fall upon the upper part of the walls themselves, the height to the cornice whence the ceilings spring not being more than twenty-five feet, so that the tops of the highest pictures can never be more than twenty feet from the floor, and must have the light full upon them. Not only the ceiling but all the decorations of the rooms may be pronounced magnificent, and both the floors and the dados, or lower parts of the walls, are of Bavarian marble, one practical advantage of which is that no pictures can be hung lower than within three feet of the ground.

In addition to these magnificent rooms, and about 1500 of the choicest pictures in the world, there is that almost anywhere else would be considered a museum and gallery of itself, namely, the Loggie, forming a line of 400 feet in extent, decorated throughout with arabesques on its walls, and with historical frescoes in the lunettes facing the arches, and subjects in each of the small cupolas covering the twenty-five compartments of this corridor. These frescoes, which have all some reference to the history of art, were designed by Cornelius and executed by Zimmermann and others.

The same year in which this Pinacotheca was begun was also distinguished by the commencement of another magnificent monument of architecture, which itself would almost have been intended for the fame of either of Klonza, or his royal patron, namely, the Allerheiligen Kapelle, or Chapel Royal (d), on the east side of the Residence. In its style however it does not at all resemble any other portion of it, but shows itself as a distinct composition. Neither does it all resemble any other works of the same architect, being in the Byzantine or Lombardic fashion (Lombardic Architecture), and the façade bearing some resemblance to parts of that of San Zeno at Verona. It may be described as about 70 feet wide and as many high, exclusive of the lower portion on each side, covered with a half-gable, and whereby the entire width is increased to about 100 feet. The centre, which is the breadth of the chapel itself, terminates in a flatish gable, beneath whose sloping mouldings is a series of small pendent or corbelled arches. These mouldings and arches are returned horizontally at the extremities, and on both piers or columns, which are surmounted by small tabernacles serving as pinacles to the angles, as is also the case with the half-gables. Slighter pilar shafts, whose carved caps do not reach quite up to the cornice, to the gables, divide the front of the chapel itself into three compartments, the middle and widest of which contains a rich portal, with receding columns and arches, with a balustrad in the lunette or semicircular tympanum over the square-headed door, and a statue on each side of the canopy or pediment which crowns this entrance. Above it is a large circular or wheel-window; and in each of the other compartments are two round-headed windows, one above the other; there is also a single window of the same design, beneath of the half-gables. With respect to the plan of the interior, although it may be said to be simple in arrangement, it is such that it is exceedingly difficult to describe it verbally with precision: the body of the chapel is 105 feet in length westward, exclusive of the aisles, or large semicircular tribune, for the altar, at its western extremity (elevated about three feet above the rest of the pavement), which gives about twenty feet more. This space cannot be described as nave and choir, or either separately, but as consisting of two square compartments of thirty feet, each covered by pendentives and a dome, and separated or united by an intermediate narrower space. On each side these compartments have below three circular-headed arches on columns, opening into what may as properly be designated loggias, as side-aisles; and above as many windows of the same form, not however immediately over the arches just mentioned, as the clerestory windows over the arches in the nave of a church, but at the back of the upper recesses, or tribunes, corresponding with those below. Consequently the width in the upper part of the building is, in appearance at least, greatly extended, and increased from thirty to nearly sixty feet across. Further than this, the description as to plan must of course be attempted; and if that has been attempted with difficulty, we ought to despair of conveying anything like a distinct notion of the profuse and gorgeous yet solemn decorations of the whole interior: the pavements, walls, arches, pendentives, domes—all is embellishments; and all that is not marble or mosaic is painting and gold. The columns are of red Salzburg marble, with white bases and gilded capitals; the socle, or bottom of the walls, is also of red marble throughout; and on the ceiling, to the height of the upper loggia, encrusted with different coloured marbles or scagliola, of which the prevailing masses are of a greenish hue; the next, voided red or blue; and the smaller surfaces dark-grey or black. The parapet of the recesses over the side-loggia and some intermediate parts are ornamented with a variety of coloured mosaic-like patterns, on a ground of stucco lustro. All the rest is entirely covered with fresco painting, upon a gold ground, after the manner of the mosaics in St. Mark's, Venice, and beneath each of the niches near Palermo. The subjects were designed, and chiefly executed, by Professor Hess: those of the first compartment and its cupola are all symbolic of the events of the
Old Testament; those of the other, of the New; while those introduced in the large intervening arch refer to the connection between the two. Thus what, judging by the three façades, as a rather fanciful division into two equal spaces, without any central culpas, is beautifully "motived and full of meaning. Many of the figures are colossal; those, for instance, of the Redeemer and the Deity heightened by the arch of the central altar. The mosaic floor may be considered as the focus where the power of art is concentrated. Notwithstanding the almost unequalled gorgeousness of this magnificent sanctuary, so far is it from being at all gaudy, that it is rather characterised by an unperturbed elegance, to which the large gold plaques of the frescos contribute in no small degree. The building was consecrated and opened for service, Nov. 1st, 1837, within little more than ten years from its foundation.

On the south side of this magnificent chapel is what was formerly the Hof Theatre, a building is now not made use of as such, the larger and adjoining building (g) being now the principal theatre. The present structure, which has a fine Corinthian portico of eight columns, towards the Max-Josephs Platz, was originally erected by Karl Fischer (died 1820), and rebuilt according to the first design, after being burnt down in 1823. On the south side of the same place is the new façade of what was formerly the Döring Palace, but is now converted into the post-gable, or post-office (A), one of the four Konigsbaus, in what is termed the Florentine style, though of a different character. The length is 290 feet, the whole of which, exclusive of thirty-two feet at each end, is occupied by an open loggia of the Florentine type. Standing upon this loggia, we find many windows above them, besides two in each of the end compartments, that is, one on the ground-floor and one above it. All these windows are arched, but enclosed within square architrave mouldings, and crowned by cornices. There are also square windows in the same design within the loggia, but only three on each side of the entrance, corresponding with the alternate arches. The whole is crowned by a cornice, with an enriched band or nave, that is, it is a little above the nave of the arch, with a red ground; for it should be observed that this building exhibits, to a certain extent, the application of polygynism, the general surface being coloured of a greenish hue, and that of the interior of the loggia of reddish-brown; while the rustie quays, columns, archivoltos of the arches, window-dressings, etc., are left white. On the west side of the Odeon-Platz (D), where, in front of the bassa, is an obelisk of cast metal, ninety-six feet high, are the Odeon or Döring Palace (A) and the Court Theatre (C), the opposite side towards the street that runs between them present two handsome and uniform façades in the Italian style, of two stories above the ground-floor, of eleven windows in each, and with a small Doric portico, or entrance porch, of four columns, of Doric or half Doric order. The principal floor of the Odeon, is 124 feet by 71, and 50 high.

Northwards from the Odeon-Platz runs the Ludwig-Strasse (L), by far the handsomest and most regular street in Munich, standing on its east side the Residenz-museum, the new public library, and new Ludwigs Kirche; on its western side, the Maximilians-Palast, Blind Institute, etc., and terminating in the spacious quadrangle of the new Georgiamueh, or university buildings. We shall speak of those as they occur in the course of the Odeon-Platz to the other extremity of the street, therefore first of the palace of Duke Maximilian, a large insulated structure in the Italian style, of about 200 by 300 feet. The façade towards the Ludwig-Strasse is 220 feet long, and corresponds in two stories, with that of the Konigsbau, although it is far less severe in character and more varied in its features. The ground-floor has three large arched doors in the centre, between four insulated Doric columns supporting a balcony in front of the three centre windows above each side of this portal are five windows, which, like those of the Postgäude and lower floor of the Pinciochek, are round-headed within square dressings. Those of both the upper floors are square-headed, the first with pediments, the second without. The principal window, including their perquitted floors and rich ceiling, are magnificient; the walls of the large reception-room, or first saloon, are adorned with six large compartments in fresco by Lang., representing the four elements, the four compass points, sixty-four feet, and thirty-five high, is profusely embellished. The next building, almost immediately opposite the preceding, is the Kriege-ministerium, or war-office, and is the work of the same architect (Klenze). The façade, 248 feet in length, is also in the Florentine style, and consists of a centre having seven large arcades, filled in with door windows on the ground-floor, and two stories above it, with two wings or lateral divisions, five windows in width, and a story lower; at the external angles and those of the centre are arched, and two stories are arched throughout, similarly decorated on the two upper floors, although the wall itself is left plain. The spandrels, or spaces between the arch-stones, of the seven arcades of the ground-floor are entirely filled up with miniature windows. The cupola of the principal tower is unusual richness and character to the whole. The building stands at the angle of the Schonfelsstrasse, towards which its south side presents a far more extensive and varied front (363 feet), uniform as to general style, but contrast as to composition; it is being divided into four wide and two advanced wings, connected on each side by four arcades with windows in them, similar to those of the other front. The end pavilions or wings are also in every respect the same as towards the Ludwigs Strasse, except that they are only three windows in breadth. The centre or body is eleven windows in breadth, and rises somewhat higher than the wings, having a series of mezzanine windows just beneath its cornice.

The remaining public buildings are all by Gärtner, and the first, immediately after passing the Kriege-ministerium, is the new public library and archive, whose lofty façade (495 feet in length) is a compound of the Florentine and palatial Renaissance. It is raised upon a basement, 44 feet high, with three portals in its centre. Each of the upper floors has twenty-five arched windows, and the whole is crowned with a cornice of very peculiar design.

The Ludwigs Kirche, which is also in the Lombardico-round-arch style, but treated with considerable originality, is no less remarkable for the beauty of its execution than the richness of its design. The front, somewhat more than three hundred feet long, consists of two stories, the lower one being an open vestibule, with arches resting upon delicate sculptured columns. Immediately over this porch are five niches with colossal statues of Christ and the four Evangelists, and crowned with arches decorated with arabesques after the mode of Giotto. Above these is a large rose window, and then the gable ornamented with foliage and open scrolls. The gable of the Ludwigs Kirche, with its statues of St. Peter and St. Paul at its angles, which, as well as the niches, were modelled by Schwantchen. Within, the nave or body of the church is 246 feet by 43, and upwards of 80 feet high. Here too, though not so profusely as in the baroques, and even equal to the architecture of the chapel, is chiefly the tribune at the end of the choir, and in those of the extremities of the transept. The principal subject is the Last Judgment by Cornelius, allowed to be one of the highest efforts of art in this century.

Nearly opposite this church are the Blind Institute, and what is called the Damenstifts-gäude, two more of those extensive masses of building which give so much grandeur to this street. The former of these is upwards of 220 and the other 400 feet in length; both are by Gärtner and both somewhat similar in style to the Public Library. The same may be said of the Georgiunm, or new university buildings, at the northern extremity of this noble street which together form a large quadrangle, into which the street itself runs.

The church of St. Maria Hlfl, in the Au suburb, the first stone of which was laid 28th November, 1831, is another noble architectural work, yet quite different in character from any of the preceding, being, for the pointed or German style. This building, which is quite insulated, has three portals in its west front, and above the middle one a large rose window. The tower is upwards of 250 feet in height, and the upper part of it consists of ornamental open work. Within, there is a pointed nave, and a single central division of which is nearly 80 feet high. Independently of its architecture, this church deserves notice on account of its nineteen splendid painted windows, by Amnml and other artists. Notwithstanding the costliness of the materials, under which branch of art has been brought of late years in Bavaria. These paintings were executed chiefly from the designs of
Ruben and Schraudolph, and under the inspection of Gärtnerei, although not the latter, but Ohlmüller (who died April 22nd, 1839) was the architect of the building.

The new Basilica of St. Boniface, by Ziebland, now in progress, promises, when completed—which it is expected to be in 1842—to surpass every other religious edifice in the city, hardly excepting the Allerheiligsten Kapelle itself. Like that building, it is in the Byzantine or Eastern taste, both as to architecture and decoration, and is upon a much more extensive scale, being 250 feet long and 120 feet wide: it is divided within into a nave and two aisles on each side of it, by sixty-four marble columns of a greenish tint, disposed for four rows. Of the middle aisle, the height is 51 feet and the height 70; of the four others, the width 15 feet and the height 40 feet. The pavement is of marble mosaic, and the roof of open timber work, the beams of which are not only carved, but richly decorated with painting and gilding, and the ceiling between them, adorned with gold stars. The walls of the outer side aisles are stuccoed with scagliola in imitation of different coloured marbles, but those of the other parts of the building will be painted in fresco by Hess, with subjects from the history of St. Boniface. In the rear of this magnificent church (the front of which, towards the Karls-strasse, has a portico of eight Corinthian columns with three bronze doors) will be another building attached to it, intended as a theological seminary, distinguished by the Glyptotheke, a corresponding piece of architecture, on the south side of the Königsplatz.

Several other buildings and public monuments might be mentioned, but however deserving of notice in themselves, they are only of secondary rank. What has been accomplished at Munich within little more than twenty years, reckoning from the foundation of the Glyptotheke, constitutes an epoch in the history of the arts, not only as regards architecture and sculpture, but also fresco and glass painting. Instead therefore of being at all an hyperbole, the title of the German Athens does no more than simply characterise a city that is, as it were, one vast museum of architecture and fresco-painting. In fact, on comparing the map of London with that of Munich, the latter, though so very much smaller a city, strikes the eye by the number of its public buildings and the great space which they occupy. The plan of Munich, published in the series of maps by the Society for the Diffusion of Useful Knowledge, will be useful to those who take any interest in the present article. This plan does not however show the situation of all the buildings here mentioned, nor the situation of any of those beyond the Kriegs-ministerium in the Ludwigs-strasse, nor the Basilica of St. Boniface. But two very conspicuous features in it suggest the propriety of mentioning the spacious new Friedhof, or public cemetery, and the beautiful park near the north-east end of the Hofgarten and Picture Gallery, called the English Garden. The latter is laid out with plantations, intersected by streams of water, and embellished with statues and various ornamental buildings, the most remarkable of which is the circular monopteros of twelve Ionic columns, erected in 1833, as a monumental temple in honour of the elector Karl Theodore, the founder of the garden; nor is it so remarkable on account of its design, as for exhibiting the first modern application of Greek architectural polychromy, the capitals of the columns and the mouldings of the entablature being enriched with various colours painted in encaustic. The other spot, the Père la Chaise of Munich, has, at its southern extremity, an extensive range of building consisting of a chapel and range of arcades, disposed in the form of a crescent about 550 feet in diameter.

The following architectural synopsis, on the plan of that accompanying the article London, will serve as a general recapitulation, and facilitate reference with respect to the architects and the dates of the buildings, as far as it has been possible to ascertain the latter, as correctly as N.B. the measurements are reduced to English feet.

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>Architect</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frauenkirche</td>
<td>1468-94</td>
<td>Jorg Gankoffen</td>
<td>Gothic, two west towers 336 feet high.—336 by 115 feet.</td>
</tr>
<tr>
<td>St. Michael's</td>
<td>1535-95</td>
<td>Wolfgang Müller</td>
<td>Façade, erected 1767, by Courvilliers; Doric and Ionic.</td>
</tr>
<tr>
<td>St. Caietan</td>
<td>1670</td>
<td>Agost. Barella</td>
<td>Rotunda, dome on 18 Corinthian columns.</td>
</tr>
<tr>
<td>Trinity Church</td>
<td>1704-14</td>
<td>Fischer</td>
<td>Grecian, Octastyle, Ionic portico</td>
</tr>
<tr>
<td>General Hospital</td>
<td>1813</td>
<td>Fischer</td>
<td>Italian, 300 by 80 feet.</td>
</tr>
<tr>
<td>Glyptotheke</td>
<td>1816-30</td>
<td>Klenze</td>
<td>Five arches, length 286 feet.</td>
</tr>
<tr>
<td>Reithahn, Riding-house</td>
<td>1822</td>
<td>Aar Bridge</td>
<td>Hexastyle, Corinthian portico.</td>
</tr>
<tr>
<td>Isar Bridge</td>
<td>1823-26</td>
<td>Probst &amp; Klenze</td>
<td>Florentine style.</td>
</tr>
<tr>
<td>Theatre</td>
<td>1824-25</td>
<td>Fischer</td>
<td>Italian style.</td>
</tr>
<tr>
<td>Kriegs-Ministerium, or War-Office</td>
<td>1824</td>
<td>Klenze</td>
<td>Italian, north and south façades 494 feet.</td>
</tr>
<tr>
<td>Odeon</td>
<td>1826</td>
<td>Klenze</td>
<td>Romanesque or Byzantine style, 145 by 103 feet and 64 high.</td>
</tr>
<tr>
<td>Pinacotheca</td>
<td>1826</td>
<td>Do.</td>
<td>Italian, round-arch style.</td>
</tr>
<tr>
<td>Synagogue</td>
<td>1826</td>
<td>Metziffer</td>
<td>Oval plan, 143 by 57 feet.</td>
</tr>
<tr>
<td>Allerheiligsten Kapelle</td>
<td>1826-37</td>
<td>Do.</td>
<td>Florentine style, façade 405 feet.</td>
</tr>
<tr>
<td>Bazaar</td>
<td></td>
<td>Do.</td>
<td>Façade nearly 800 feet long, in the Palladian style.</td>
</tr>
<tr>
<td>Hof-arkaden</td>
<td></td>
<td>Do.</td>
<td>Florentine style.</td>
</tr>
<tr>
<td>Protestant Church</td>
<td>1827-33</td>
<td>Pertich</td>
<td>Italian style.</td>
</tr>
<tr>
<td>Königsbau</td>
<td>1827</td>
<td>Klenze</td>
<td>Bronze, 35 feet high.</td>
</tr>
<tr>
<td>Festbau</td>
<td></td>
<td>Do.</td>
<td>Byzantine style, towers 209 feet high.</td>
</tr>
<tr>
<td>Prince Maximilian's Palace</td>
<td>1828</td>
<td>Do.</td>
<td>Gothic, nave and side aisles.</td>
</tr>
<tr>
<td>Leuchtenberg Palace</td>
<td>1828-33</td>
<td>Gärtners</td>
<td>Façade 494 feet, Florentine style.</td>
</tr>
<tr>
<td>Obelisk</td>
<td></td>
<td>Do.</td>
<td>Timmer bridge, 575 feet long.</td>
</tr>
<tr>
<td>Ludwig's Kirche</td>
<td>1831</td>
<td>Gärtners</td>
<td>Florentine style, façade 214 feet.</td>
</tr>
<tr>
<td>Pfarrkirche, St. Maria Hilf</td>
<td></td>
<td>Gärtners</td>
<td>Gothic or Old German style, three towers.</td>
</tr>
<tr>
<td>New Public Library and Archive</td>
<td>1832</td>
<td>Gärtners</td>
<td>Circular monopteros, Grecian Ionic.</td>
</tr>
<tr>
<td>Theresienbacher Bridge</td>
<td>1832</td>
<td>Gärtners</td>
<td>Byzantine, nave and two aisles on each side.</td>
</tr>
<tr>
<td>Blind Institute</td>
<td>1832</td>
<td>Gärtners</td>
<td>Florentine style, façade 299 feet long, 66 feet high.</td>
</tr>
<tr>
<td>Isar Thor or Gate</td>
<td>1833</td>
<td>Gärtners</td>
<td>Florentine style, façade 430 feet.</td>
</tr>
<tr>
<td>Polychrome Temple</td>
<td>1833</td>
<td>Gärtners</td>
<td>Colossal sitting figure; entire height of the monument, which is of bronze, 36 feet.</td>
</tr>
<tr>
<td>St. Boniface</td>
<td>1833</td>
<td>Georganian</td>
<td></td>
</tr>
<tr>
<td>Potsdam</td>
<td>1833</td>
<td>Georganian</td>
<td></td>
</tr>
<tr>
<td>Georgianium</td>
<td>1834</td>
<td>Klenze &amp; Rauch</td>
<td></td>
</tr>
<tr>
<td>Equestrian Statue of Maximilian I</td>
<td>1835</td>
<td>Klenze &amp; Rauch</td>
<td></td>
</tr>
<tr>
<td>Damenstaatsgebäude</td>
<td></td>
<td>Gärtners</td>
<td></td>
</tr>
<tr>
<td>Monument of Maximilian, Joseph I</td>
<td>1835</td>
<td>Gärtners</td>
<td></td>
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MUNICIPIUM, a term which properly denotes, according to its etymology (munus and capio), the capacity of enjoying rights with the liability to duties. It is however used in the ancient Roman writers to signify a class or body, the members of which are called municipes.

Municipium, as a collective name for a number of individuals, had different significations at different periods of Roman history. In its oldest sense, it signified those inhabitants of a town which was not subject to the jurisdiction of the Roman state, by which the citizens of such towns, though not Roman citizens, enjoyed, when at Rome, all the privileges of Roman citizens, except the suffrage and the eligibility to the office of consul. Such municipes were subject to the burthens of Roman citizens: the Fundaui, Formiani, Cumani, Acerrani, Lanuvini, and Tusculani are mentioned as examples. A Roman jurist (Servius, the son) says that municipes originally signified those who became citizens, their own state remaining perfectly distinct from and unconnected with the Roman state, and who were not allowed to attain to the dignities of the Roman state. (Festus, Epit., Municipium.) This first definition, which is as precise as a short one can possibly still leave room for many questions. Niebuhr is of opinion that the author of the first definition is mistaken in saying that such municipes were not Roman citizens; but his reasons for disputing the accuracy of the definition do not seem conclusive. The word was also used of those municipes which, under the Constitutions of the Roman State, had become part of or was blended with the Roman state, as was the case with the inhabitants of Caere, Acria, and Anagnia. (Festus, Epit., Municipium.) But this would appear to be a misapplication or improper application of a term which was properly used of the class of inhabitants of such towns as did not become subjects of the new Roman empire, when the emperor erected under the emperors were improperly so called, inasmuch as the inhabitants of these towns became or were Roman citizens, and in all respects subject to Roman law.

The original significations of municipium in the old Roman law is treated of in detail in an essay (vol. ii.) in an instructive chapter which contains all the necessary references. It is not easy however to assent to all this writer’s opinions.

MUNIMENTA. This word is a derivation from munus, which signifies 'I defend,' and originally designated these writings in which are recorded the transactions of former times, out of which existing relations, in respect of political rights, social rights, or property, arise. Hence, by observing the manner of their transmission and possession of them by the parties who have rightfully inherited them.

But munimenta has, in the course of ages, acquired a somewhat different sense; and from betokening the documents themselves, it is sometimes used to denote the depositions of witnesses. Still, by those who aim at speaking with precision, it denotes the written documents themselves. It is also rarely used in reference to any small collection of such documents, as munimenta of deeds, munimenta of wills.

In such cases the correlative expressions are title-deeds, or evidences, which means however precisely the same thing, only on a smaller scale. But when we speak of the documents by which the rights of a person are defended in court, we mean the munimenta in a more particular sense, as the title, or vast manorial or ecclesiastical privileges, the word of greater dignity, munimenta, is often used; and still more when the evidences are spoken of which show the right of the crown of any kingdom to its possessions, or the right of a crown or people as sustained by written documents.

Private collections of evidences rarely contain anything that is of earlier date than the reign of Edward I. The public muniments of the English nation are believed to excel those of any other nation, both in number, preservation, and the remoteness of the period at which series or classes begin. Yet there is little previous to the reign of Richard I. There is no series commencing before that reign, except that of the Pipe Rolls, the Great Roll of the Exchequer, in which were entered, year by year, the receipts of the crown, and many of its payments. This series begins in the second year of King Henry III, and from that time to the present day has been kept up. The account of the income of the crown, the crown, or of a subject against the crown, or of one subject against another.

The public muniments are divided into two classes. The first consists of documents, or those which are called "Domesday Books"; the second of nearly the whole of the kingdom, made by William the Conqueror, a book which is still sometimes appealed to in determining rights of the crown, or of a subject against the crown, or of one subject against another.
The general character of the surface is mountainous. The north-western extremity beyond the Shannon is overspelt with a range of hills, the terminal part of which is Slieve Boffety, or Sliebe Boffaty, and the Inchiquin Mountains, form part. Two ranges of mountains extend nearly across the province from east to west, enclosing the long narrow basin of the Blackwater. The northern range includes the counties of Offaly and Roscommon, and the Galtee Mountains (3000 feet high); Ballibrough Mountains; Slieve Mish, or Sliebehinish, near Tralee; and at the extreme west, Mount Brandon (3150 feet high), and the heights about Dingle: the southern range includes the Nangle and Bograh Mountains; Macgillicuddy's (or Macgillicuddy's) Rocks (3465 feet high) and the other mountains of Killarney; and, in the extreme west, the mountains of Iveragh and Dunkerron. The Shyee and Glanraught Mountains, and other high grounds, are well marked on the screen.

The western side of the province is the most elevated; and the principal streams (except the Shannon) flow between the mountain ranges from west to east.

The mountainous character of the province, and the general direction of the mountain-chains from east to west (or, more accurately, from east-north-east to west-south-west), determine the outline of the coast. From the mouth of Waterford Harbour, the boundary of Munster and Leinster, to Ballycastle, the coast runs west-south-west, marked only by small bays, with intervening headlands, and by the estuaries of several rivers, most of which turn rather abruptly to the south a little above their outlet. These estuaries form the excellent harbours of Waterford, Dun- graig and Youghal, which, at the same time, are the chief westward extremity of this line of coast is Cape Clear Island, which takes its name from a well-known promontory, the last point of British ground usually seen by vessels in their departure for America, and the first on their return from the west.

The south-western and western coasts from Cape Clear are marked by a succession of bluff promontories, formed by the extremities of the mountain ranges, with the deep intervening bays of Dunmanus, Bantry, Kenmare, and Dingle. From Dunmore Head, which forms the northern extremity of Dingle Bay, the coast stretches away to the north-east, retaining its irregular and broken outline. It is marked by the bay of Tralee and the estuary of the Shannon.

The chief rivers are the Suir, the Blackwater, the Lee, and the Bandon, all of which, except the Suir, in the upper part of its course, and the others just above their outlet, have a general direction from west to east. There are not many lakes, nor any of great extent; the principal are behind Kenmare, near Dingle, and in the picturesque beauties of the surrounding scenery. The bogs are neither so numerous nor so extensive as in most other parts of Ireland. The province is divided into the six counties of Clare, Cork, Kerry, Limerick, Tipperary, and Waterford, to the separate articles on which we refer for further information. For ecclesiastical purposes Munster is nearly coincident with the archiepiscopal province of Cashel, which is, after the decrease of the present metropolis, to be united to the province of Dublin. It contains the dioceses of Cashel, Emly, Killenaun, Killaloe, Waterford, Lismore, Cork, Ross, Cloyne, Limerick, Ardfeint, and Aghadoe, several of which are already united, or are to be so at the decease of the present holders, by virtue of the late act for regulating the dioceses of the Irish Established Church.

This district, at an early period, consisted of two districts; one of these, which was sometimes designated South Munster, and included the district of Desmond, and probably also the province which is now divided into the counties of Waterford, Tipperary, Cork, Kerry, and Limerick. The other part was north-west of the Shannon (Finglas's Breveit of Ireland) and is now divided into the five counties of Waterford, Tipperary, Cork, Kerry, and Limerick. This part was antiently known as Thomond, North Munster, or O'Bryan's Country.

The kingdom of Munster existed at an early period of Irish history. The seventh century Brian, called Maouineboine or Boro, acquired so high a reputation for valour and wisdom as to be enabled to usurp the sovereignty of Ireland antecedently held by the king of Meath. [Exact.]

Brian fell at Clontarf, fighting against the Danes and such of the Irish as supported them. The sovereignty of Ireland (which was indeed little more than nominal) did not remain in his family, which at the time of the English invasion seems to have retained only Thomond, the sept or family of MacArtby or MacCarly having the chief dominion in Desmond. South Munster, the South-west of the kingdom of Roderic O'Connor, king of Connacht and paramount of the Irish princes, was recognised by these chieftains. At an early period of the conflict between the Anglo-Normans and the English of Thomond, the king of Thomond, and the other chieftains of the invaders (A.D. 1171); and when Henry II. in person landed at Waterford, the prince of Desmond made his submission (A.D. 1172), and was admitted to retain his principality on condition of homage and tribute. Waterford had been previously taken by storm, and Cork and Limerick were occupied; and the inferior chieftains vied with the superior in the readiness of their submission. Henry's wars having obliged him to weaken his army in Ireland, the natives rose in rebellion, and among them the princes of Thomond and Desmond. When the English rallied, Thomond was the first attacked; Limerick (which appears to have belonged to this principality) was taken (A.D. 1174 or 1175), and O'Brien, after a stout resistance, was obliged to submit (A.D. 1176). The prince of Desmond, who had also come to terms with Cogan and FitzStephen, two Norman adventurers, who acquired large possessions round Cork. Dissension among the natives themselves, or between them and the new conquerors, continued for a long time to distract the province. South Munster was divided into counties, as at present, in the reign of Henry VIII., when Finglas drew up his 'Breveit'; but Thomond continued till after that time under its native princes. The chief families of the Anglo-Norman race who settled in Munster were the FitzThomas, earls of Desmond, the Butler's earls of Ormond, the Geraldines, Barry, Roches, and Cogan's. In the time of Elizabeth an attempt was made to establish an English colony in the province, on the lands of the earl of Desmond and his adherents, attainted for treason, but the attempt met with but little success. In this period
but his cruelty and debauchery have marked his character as one of the worst princes of the Ottomans. (Rycualt, Turkish History.)

Mura'n'da, or Anguill'lid'a, a family of fishes belonging to the section of the Malacopterygii called Apodes. Their bodies are elongated and covered with scales; the skin is tightly imbedded and scarcely apparent. They have no eels, but nearly all are furnished with a natatory bladder. In the first group, which constitutes the great genus Muran, the body is very elongated and covered with small scales; the skin; the gill-opening is small, and is situated far back, an arrangement which, by more completely protecting the branchial, permits these fishes to live a long time out of water.

The species of the genus Anguilla are distinguished by the possession of pectoral fins; the dorsal, anal, and caudal fins are united. The dorsal commences at a considerable distance behind the pectorals; the upper jaw is shorter than the lower; the gills open by a small aperture on each side, situated beneath the pectoral fin. Three (if not four) species of Anguilla, or eel, are found in this country—the sharp-nosed eel, the broad-nosed eel, and the ang. The sharp-nosed eel (Anguilla acutirostris, Yarrell) may be distinguished, as its name implies, by its comparatively narrow and sharp muzzle. 'The head is compressed, the top convex, depressed as it slopes forwards; the eyes small, placed immediately over the angle of the mouth; its snout is short, the jaws very powerfully armed, the lower at the end; the lower jaw the longest; nostrils with two openings on each side, one tubular, the other a single orifice; both jaws furnished with a narrow band of small teeth; gope small; various mucous pores about the mouth and other parts.' Gills open immediately before and rather below the origin of the pectoral fin; the scales on the body rather small; dorsal fin extending over more than two-thirds of the whole length of the fish; anal fin, almost as long as half of the whole length, both united at the end, forming a tail; the number of rays in the first fins not easily ascertained, from the thickness of the skin; the lateral line exhibits a long series of mucous orifices; vertebrae 113. The vent includes four distinct openings, the most anterior of which leads upwards to the intestine, the posterior to the urinary bladder, in a direction backwards, and one elongated lateral opening on each side communiating with the cavity of the abdomen, as in other bones. 'The colour of the upper surface of body and head very dark olive-green; under surface silvery: the colour appearing however sometimes according to the nature of the water in which the animal lives, as in other fishes; in those found in clear streams the colours are bright, whilst those found in stagnant water are dusky.'

This species is common in streams, lakes, &c., throughout the country. The eel is said to be averse to cold, and in the autumn migrates down the rivers to reach the warm brackish water, where it passes the winter and deposits its spawn; in the spring the young follows their way up the streams, sometimes in immense numbers. Such a desire do the young eels (about three inches in length) appear to have to go up the stream, that their course is not easily stopped. The writer of this has seen a flood-gate, six or seven feet in height, in parts covered with them, and has observed many succeed in passing over this perpendicular barrier, by availing themselves of the trickling water which escaped through the crevices of the wood-work.

In some parts which live in ponds, and cannot therefore migrate, bury themselves in the mud during the winter months. In these cases however they will sometimes leave the water, and, availing themselves of the wet grass during the night, travel considerable distances in order to reach a stream; they are known also to leave certain ponds, the water of which does not suit them, and to make their way over land to other and more favourable situations.

The question as to whether the eel be an oviparous or viviparous fish has been much discussed by naturalists, many having imagined that it brought forth its young alive, but there appears to be better grounds for the belief that it is oviparous. 'The London market,' Mr. Yarrell informs us, 'is princi- 
pally supplied by Holland and by the Thames. There are two companies in Holland, having five vessels each; their vessels are built with a capacious hold, in which large quantities of eels are preserved alive till wanted. One or more of these vessels may be constantly seen lying off Bil-

lengate; the others go to Holland for fresh supplies, each bringing a cargo of 15,000 to 20,000 pounds weight of live eels, for which the Dutch merchant pays a duty of 15s. per cargo, for his permission to sell.

The broad-nosed eel (Anguilla latirostris, Yarrell) is not uncommon on the south coast, in the sandy waters as the sharp-nosed species, from which it is readily distinguished by the comparatively greater breadth of its head, and the situation of the eye, which is placed in advance of the angle of the mouth. The body is more ovate in appearance than its length; the teeth are large, numerous, larger, and stronger; the dorsal fin commences farther back; the dorsal and anal fins are much deeper and thicker. The number of vertebrae is 115.

The striped eel (Anguilla maculata, Yarrell) is in some respects intermediate between the common or sharp-nosed species and the broad-nosed eel. The general colour above olive-green, and beneath yellowish-white. 'In the comparison breadth of the nose, the snig is intermediate in reference to the sharp and broad-nosed eels, but rather more resembling that with the sharp nose,' says Mr. Yarrell; 'it has a slight but elongated depression extending from the anterior edge of the upper jaw to the upper and back part of the head. The tubular openings of the nostrils are longer, and the mucous pores about the lips larger and more conspicuous, both jaws rounded at their extremities, the lower one the longest; teeth longer and stronger than in the common sharp-nosed species; gape large; the angle and the posterior part of the eel more slenderly rounded; there are eight dorsal fins, the commencement of the dorsal fin, and the vent, are each placed nearer the head than in either of our fresh-water eels.'

Besides the distinguishing characters above pointed out, there are others, the most important of which perhaps is the difference observable in the form of the vertebrae—see Yarrell's History of British Fishes, where the skulls and adjoining vertebrae of these three species are figured.

The conger eel (Anguilla anguilla, Linnaeus; Conger anguissura, Le Congre, Cuvier) is readily distinguished from the fresh-water species by the upper jaw being the longest, and the dorsal fin commencing much nearer the head—the characters which have induced Cuvier to separate it from them as a subgenus.

This marine species is common on many parts of our coast, and is indeed found in most of the European seas. It attains a very large size, being often five or six feet in length and occasionally seven feet long; the thickness bearing about the same proportion to the length as in the common eel. The upper parts of the body are brownish and the under parts dirty-white; dorsal and anal fins whitish margined with deep bluish-black; the lateral line is olive-green or white.

In the Mediterranean another species of conger (the Anguilla myrus) is found. It resembles the common species, but is of a smaller size, and is known by being open at the snout, a band across the occiput, and two rows of dots on the side of the body. It is not found where there are of which the conger eel is a. Nearly allied to Anguilla, is the genus Ophiocephalus of Lacépéde, the species of which differ from the true eels by their dorsal and anal fins terminating before they reach the end of the tail, which has no fin. The posterior orifice of the nostrils opens on the edge of the upper lip. One species inhabits the Mediterranean, the Ophiocephalus serpentis; it is about five or six feet in length and about three inches in thickness, of a brown colour above and very dark below, the snout is a little pointed. In some species of this genus the pectoral fins are very small, and in this respect approach the genus Murana, a which there are no pectorals; their branchial openings are small; the operculum and branchiostegals rays are connected by the skin.

Many of the species of this genus are beautifully marked or spotted; several are found in the Mediterranean, and one species, the Murana Helena, L., has been found on the British coast.

Several other genera belonging to the present family—among which the genus Gynanotus (which contains the electric eel) may be mentioned—are noticed under their respective names.

Murat, Joachim, one of the most celebrated of the French imperial marshals, and by Napoleon created king of Naples, was born at a village in Picardy, in 1747. He father was a country innkeeper, who had been a steward at...
the great family of the Talleyrand's, and through their in-
terest young Joachim was placed at the college of Cahors,
and thence to Toulouse; but his disposition to con-
duct little fitted him for the sacred profession, and an
amour led him to discard the ecclesiastical habit and enlist
into a regiment of chasseurs, from which he soon after disci-
pline Reinstating him to his native village, he took charge of his father's house until the break-
ning out of the Revolution, when he obtained his enrolment
into the constitutional guard of Louis XVI., from which he
passed as sub-lieutenant into a regiment of chasseurs.
During the collection Muratori, the ab-
astic champion of liberty and equality, and rose rapidly
to the rank of colonel; but his Jacobin predilections did not
prevent him from making himself useful to Bonaparte
in the affair of the Sections in 1793; and he was rewarded by being
after the return of the republic and the future emperor
in his glorious Italian campaign of 1796.

From that hour the fortunes of Murat closely followed
those of his patron. The fiery valor, which the "handsome
swordsmen" (beau sabreur), as he was called, showed in a
hundred fights, the splendor though somewhat fantastic
contest in which he delighted to figure, and the love of
daring achievement which threw an air of antient romance
over all his actions, invested him, in the eyes of his admiring
telegraph, in the annals of Napoleon himself; and his
and entering talents in the field obtained for him
the greater distinction, in the cool judgment of Napoleon
himself, of the best cavalry officer in Europe." He com-
manded an army in the march on Italy; he occupied
Prussia; and in all, at Aboukir, Marengo, Austerlitz,
Fena, Eylau, and Friedland, his services were brilliantly
conspicuous.

After the Egyptian campaign, he obtained the hand
of Carlotta, youngest sister of Napoleon; and in 1806
was raised to the dignity of a sovereign prince, and recog-
nised by the continental powers as grand-duke of Berg and
eleva.

In 1808 he commanded the French army in Napoleon's
unprincipled invasion of Spain; from which country he was
called and sent to Naples to ascend the throne of that
kingdom, vacant by the elevation of Joseph Bonaparte to
the Spanish crown. In 1812 he accompanied Napoleon on the
expedition to Russia, in the command of the cavalry of the
grand army—the most numerous and splendid body of horse
perhaps which the world has ever seen arrayed in the ages
of civilized warfare. During the advance to Moscow, Murat
exercised his accustomed prodigies of personal valor; but
he reverses of the retreat disgusted him; reproaches which
passed between Napoleon and himself aggravated the recol-
uction of some former slights and wrongs of which he
was supposed to have been guilty to him; and although he
again served the emperor in 1813, he finally, after the disastrous battle of Leipzig, de-
serted his waining fortunes, and allied himself with his
enemies. By this defection he for a time saved his own
princely dignity; but in order to raise his regal title alarmed his suspicions, and hurried him,
by the reappearance of Napoleon in France, in 1815, into
ostilities against the allied powers. In an attempt to
inde the Italians to arm for their national independence, he
ignorantly failed; he was compelled to flee from his kingdom;
and despairingly landing again in arms on the coast of Cal-
aria with a few followers, he was captured, and shot by the
usual sentence of a Neapolitan court-martial. As a sovereign
in Russia and a general, he was a failure; but as a politician he was weak, vacillating, and faithless; in
the end the best cavalry officer in Europe" was assuredly
no general; as a man he had many warm and noble feelings;
ut of fixed principle, either in private or public life, he was
thirty destitute.

MURATORI, LUDOVICO ANTONIO, born in 1672,
Vigolos, the birth-place of the architect Barocci, in
the toodiense territory, studied at Modena, and showed
an early taste for history. His enemies accused him of
ennerred holy orders, and at the age of three-and-twenty he
was appointed one of the librarians of the Ambrosian
library at Milan. In that collection he discovered several
seized MSS., from which he made extracts, which he
published under the titles: Aneccota Latina; Aneccota Graeca. Some years
after he was recalled to Modena by the duke Rinaldo, who
saw him the situation of librarian of the rich library of the
house of Este, a place which he retained for the rest of his
life.

After this appointment Muratori devoted himself entirely
to the study of the Italian records of the middle ages; and
after many years of assiduous labour he produced his great
work, 'Rerum Italicarum Scriptores, ab anno crebris
quingentisimo ad millenium quingentissimo,' 26
vols. fol. The first part was published in 1723, and the last appeared in 1751. Several
princes and noblemen defrayed the expenses of the publica-
tion; sixteen of them contributed 4000 ducats each. In
addition to the records of Italy during the middle ages which he could discover, most
of which were inedited, and has accompanied them with
valuable commentaries. Some of the texts had been
already published by Gravius, in his 'Thessaurus Antiqui-
tarium et Historiarum Italian,' but Muratori's edition
was the most complete, and to the last century or two of the period of a thousand years
embraced by Muratori. In seeking after the historical records of the middle ages, Muratori collected also a vast number
of documents concerning the social, civil, intellectual, and
political condition of Italy during that period. 'Annali d'Italia
1774, which he transcribed and commented upon, and he published
the whole in seventy-five dissertations: "Antiquitates Italic medi aevi, sive Dissertationes de moribus Itali populi, ab anno aqnt
quisimo ad annum milen domini mille quingenta," 26
vols. fol., 1738-42. 'I have treated first," says the author in his
preface, "of the kings, dukes, marquises, counts, and other
magistrates of the Italian kingdom; after which I have in-
cluded the history of the political government, and
also the manners of the private citizen, the courts, and
and franchises of some classes and the servitude of others;
the laws, the judicial forms, the military system; the arts,
sciences, and education; the progress of trade and industry;
and other matters of civil and domestic

Muratori has been truly called the 'Father of the history of the middle ages.' Subsequent historians, such as Sim-
ondi and others, are greatly indebted to Muratori, without
whose labours they could not have undertaken or completed their works. Muratori wrote an abridgment of his
Dissertations in Italian, which was published after his
death: 'Dissertazioni sopra l'Antichità Italiane,' 3 vols. 4to.,
1766. He also wrote in Italian, 'Annali d'Italia dal prin-
cipio dell' era volgare sino all' anno 1550,' 12 vols. 4to.,
1765. It is the first general history of Italy that was published,
and is a useful book of reference. It has been continued by
Coppi down to our own times: 'Annali d'Italia in continu-
azione di quelli dei Muratori, dal 1750 al 1919,' 4 vols. 8vo.,
Rome, 1829. Another work of Muratori is 'Nuovo Thesaurus veterum Inscriptionum,' 4 vol. fol.,
1739, in which he has inserted many inscriptions unknown to Gruter, Spon, Fohratti, and other archaeologists who had preceded
him.

His work 'Antichità Estensi, in 2 vol. fol.,
Modena, 1710-40, is the Faust of the house of Este in its
various branches. He also wrote several historico-political
works of his own, the 'Ricettario di Venezi,' which
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done in the case of Muratori's works, because it was well known that he, the pope, shared in the universal esteem in which his name was held.

The character of Muratori is clearly seen in his works. Most thought learned, indefatigable, intent upon the improvement of mankind, charitable and tolerant, sincerely religious and strictly moral, he was one of the most distinct and yet most unobtrusive among the learned of Italy.

He was rector of the parish of Pompensa at Modena, but his literary occupations did not make him neglect his flock; he stuttered in the study with his pen as he had done in the ministry. He founded several charitable institutions, and rebuilt the parish church. He died at Modena, in 1750. His minor works were collected and published at Arezzo, in 1787, in 19 vols. 4to. His tomb is in the church of St. Agostino at Modena, near that of his native town. He was a great patron of illustrious countrymen, and the young men who were in pursuit of the Baroque were mostly bare and uncultivated, cover two-thirds of the surface of the province. Both mountains and plains however yield in parks excellent pasturage.

The coast between Catania and Messina, the kingdom of Granada presents a series of steep and rocky cliffs; eastward from that port it is low and sandy; the whole coast is studded with watch-towers at intervals.

The climate of Murcia is varied; temperate and delicious; on the west it is dry and unhealthy, on the east hot in the plains. Storms are not uncommon in the spring; the summers are exceedingly hot, the mercury often rising above 100° Fahr. In the shade; the autumns are delightful. The rivers, besides, are the chief source of the water and are the most unknown, and the foliage is always green. Clouds and rains are rare, and the sky is throughout the year so blue and bright as to have gained for Murcia the title of 'the most sunny place in Spain.' But on the other hand the rain is very scarce; in some parts a whole year will elapse without the fall of a shower.

Of the geology of this province little is known: the mountains are principally of limestone; the Sierra de Segura in the west is one of gray and white limestone; the vale of Segura greenstone is found; trachyte and other volcanic rocks at Almazara on the coast, where is also an aluminous rock, which is quarried. The chain between Murcia and Cartagena is of sandstone with mud, lignite, and gypsum; the latter is also found in green marbles on the chalky range to the east of the city of Murcia. Forphyry, primary slates and schist, fine marbles, rock-crystal, freestone, bole, and nitre are found in various parts of the province. Near Hellin is a mine of sulphur, at Villena a saltpet, and saltpetre abounds in the neighbourhood of Cartagena. There are several lead-mines in the province, and report says that there are veins of silver and copper, but these are not worked; there are also some lead-smelting and cold mineral waters.

The vegetable productions are wheat, of which the ordinary harvest amounts to 701,956 quintals; or about 1,841,066 bushels, but in rainy seasons to nearly double this quantity. Wheat, rye, rares, peas, and beans are of fruit of superior quality, particularly oranges, limes, mandarins, and pomegranates. The most common trees are the mulberry and the olive; evergreen and other oak poplars, and carobs are in some parts numerous. The pomegranate on the Sierra de Segura form the largest forest in the south of Spain. The neriun oleander, castus, tamarisk, pomegranate, birch, pear, chestnut and horn, and Amelanchier also grow here. Hemp, flax, and sepa- lated: the quantities of barilla are produced on the sea-coast; and oil and also extensively produced, with some success and wine. The estepa ruins grow most luxuriantly in the neighborhodes of these forts; in the time of Estapa, Murcia, who, on this account, gave that city the name of Cartagena.

Sparta.

Cattle are not numerous in Murcia; they are principally sheep and goats. The pigs are very coarse and wild. Game is found in vast quantities; fowl is scarce, however, only enough to supply the consumption of the province. The chief product is wool, which is wrought into ribbons, taffetas, and velvets, all of inferior quality; knives and other cutlery are made at Alcaete, a small quantity of soap at Villena and Murcia, and a little earthenware, with some salt-petre and gunpowder.
at the latter city; the manufactures of coarse linen, bradsley, hemp, and flax are very insignificant.

Commerce in Murcia is at a very low ebb, owing to the indifference of the inhabitants in agriculture and manufactures. If the wretched state of the roads did not prevent much intercourse with the interior, the kingdom of Murcia, which is esteemed the best in the country, would probably be made the outlet for the exports of the inland provinces. The other seaport, that of Las Aguilas, a small town built by Charles III, is now falling into decay. Near the coast is a singular laborador bay, the banks of which are many miles long by three broad, called La Encalizada de Murcia, but it is adapted only to very small vessels. Corn and wine are exported when the harvest or vintage is good, otherwise there is nothing connected with the coast that is of any consequence.

The principal towns in this province are Murcia, the capital; Cartagena [Cartagena]; Lorca [Lorca]; Chinchilla, a custom-house, with 11,000 inhabitants; Villena, with 9500; Hellín, with 8000; Cejas, with 6500; Almansa, the Almanza of the Romans, with 6000; Segura de la Sierra, with 4000; Jumilla, with 6000, celebrated for its sugar, which is made of a heavy and glistening sugar. The most celebrated of the town is the house of the Bourbon dynasty; Tuta, with 12,000; Alhama, with 4000, renowned for its baths and hot-springs; and Molina, with 3000 inhabitants.

The Murciano is tall and well-made, with good features but a sallow livid complexion, and very African in appearance. His leading characteristic is sloth, for he is preeminently the sluggard of Spain, and spends the greater part of his time in idleness, and he is inured to sin, and morose in disposition, yet very choleric, litigious, and revengeful; suspicious and frugal, and therefore not fond of society or amusements; bigoted to old customs, and profoundly ignorant. The women are said to be mild and amiable, and less attentive to dress than most of their countrywomen. They wear the national costume—the banqueta and mantilla. The peasantry wear close-fitting caps, white jackets, loose and short linen drawers put round the middle with red stripes of silk, and long narrow plaited of striped wool. The language of Murcia is Castilian, corrupted by Arabic and Valencian.

Murcia was the part of Spain first colonised by the Carthaginians before they employed their forces against Scipio. Cartagena. It passed, with the rest of the peninsula, under the dominion of the Romans and Goths; from the latter it was conquered, A.D. 522, by Justian, emperor of the East, and it remained in the hands of the Greeks till 624, when it was recovered by the Saracens. In 712 it was conquered by Abd-al-Rahman, son of Musa, the Arab invader of Spain. It continued subject to the khilaf of Cordoba till A.D. 1144, when, after the disruption of that khilafat, it fell under the dominion of the prince of Granada; but in 1212 was re-connected to Cordoba. In 1239 it was raised into a distinct kingdom by Hudiel, who the following year submitted to Ferdinand the Saint, king of Castile, consenting to pay tribute on condition of being allowed to hold his own religion, if he be encouraged to regain his independence, but was conquered and defeated in 1266 by Alfonso X. of Castile and James I. of Aragon. Murcia has ever since remained in the hands of the Christians, and now forms part of the kingdom of Granada; (Muñano, Diccionario Geografico-Estadístico de España y Portugal; Laborde, Itinerario Descriptivo de l'Espagne; Townsend's Journey through Spain; Cook's Sketches in Spain; Mariana, Historia General de España; Conde. Labordes En Espagne.

MURCIA, a city, of Spain, the capital of the province of that name, lies in 38° 2' N. lat. and 1° 14' W. long. It is distant 226 miles from Madrid, 36 from Cartagena, and 48 from Lorca, and is situated in a valley on the bank of the river Segura. This valley is called the Huerta or Gar
don de Murcia; in county, says Townsd, it exceeds everything I had seen in Spain. Its soil is a rich loam well watered by means of Moorish reservoirs and watercourses; and in fertility it yields no part of the Peninsula. Mulberries, olives and corn, hemp and flax, are its chief productions; and there are many trees which yield orange toes and clusters of date-palms. Though in length only 24 miles, and in breadth 5 or 6, it is said to contain more than a third part of the population of the whole province.

The city of Murcia is first mentioned in history under the name of D'Orocles, just before the invasion of the Arabs, by whom it was besieged and taken, A.D. 714. It continued subject to the khilafate of Cordoba till 1144, when it was recovered by the Christians, and again in 1212 by Alfonso X. of Castile, and again subject to Cordoba, and in 1230 was made the capital of a distinct kingdom by Hudiel, who the next year submitted to Ferdinand the Saint, king of Castile. In 1266 he revoked, and was conquered by Alfonso X. of Castile, in 1266; since which time Murcia has remained in the hands of the Christians.

Murcia at the present day contains about 35,000 inhabitants. It is the seat of a bishop, suffragan of Toledo, whose diocese comprehends almost the whole of the province. The principal buildings are the cathedral, 10 other parishes, 21 convents, 12 for monks and 9 for nuns (suppressed in 1835), 5 colleges, a casa de misericordia, or hospital, the bishop's palace, the town-hall, the granary, the custom-house, the arsenal, the quay, and the arsenal of silk. It has also 33 schools, 2 public libraries, 16 posadas or inns, and several manufactories. The cathedral is of freestone and marble, very spacious, richly decorated externally, but plain within. The left bell-tower is attached to it is ascended by a spiral slope without steps.

Murcia was formerly fortified, but is now open on every side. Four of its ancient gates however remain. The streets are narrow, crooked, and irregular, but the handsomest is that of La Trapería. The houses are mean; some of the most ancient have front doors decorated with grotesque sculpture of bad workmanship; many have gardens attached, filled with orange or palm trees. There are many large manufactures; one of silk, one of brass and iron, and one of gunpowder. In the town is an old castle, Del Espario, San Domingo, Santa María, and Las Torres, where the bullfights are held. A handsome bridge of two arches connects the city with the suburb of San Benito on the right bank of the Segura. Along the left bank is a promenade with handsome houses. Three other well-shaded promenades are in the vicinity of the city, but they are little frequented by the citizens.

The commerce and manufactures of the city are very considerable, y selfies the centre of the industry of the province. It has 5 potteries, 10 factories of cloth, 1 of soap, 1 of white-lead, 6 inns, 2 oil-mills, 6 establishments for the spinning of silk, and 1 of wool; the manufacture of silk is not carried on in Murcia, but at a little distance, near the town of Cieza, in a small valley, where there is a royal factory of gunpowder, producing 800,000 lbs. per annum, and one of saltpetre, producing yearly 30,000 lbs., though formerly not less than 250,000 lbs. The manufacture of the esparto rush into baskets, cordage, sandals, &c., gives employment to many hands. Provisions are exceedingly cheap at Murcia. Beef and mutton sell at about 3d. per lb., veal rather above and pork rather below that sum. Good wine, about 2d. the bottle. The prices of daily labour are from 10d. to 14d. The return to the eschequer amount to more than 15,000l. sterling per annum.

The citizens in character do not differ from the other inhabitants of the province; they are equally slothful, gloomy, and reserved, and little addicted to pleasures; on this account Murcia is one of the dullest cities in Spain.

Murcia has given birth to few great men. Schamasdini, a learned man among the Spanish Arabs, was born here many centuries since; and except a few painters, sculptors, and architects, no greater personages, in the eyes of our disinterested citizen, of whom Murcia can boast is the Count Florida Blanca, primo minister of Spain, who died in 1782. (Labadie, Itin. Descrip. de l'Espagne; Townsend's Journey through Spain; Mariana, Hist. de España; Conde, Hist. de los Aranes en España; Muñano, Diccionario Geográfico Estadístico de España; Inglat's Spain in 1830; Cook's Sketches in Spain.)

MURDR. In the earlier periods of English jurisprudence, murder, murdrum, was a term used to describe the...
secret destruction of life, witnessed and known by none besides the slayer and any accomplices that he might have; so that the hue and cry, which the law required to be made after malefactors, could not be raised. The term was also the name of an amercement or pecuniary penalty imposed, until the reign of Edward III., upon the county or district in which such a secret killing had taken place. One of the modes of escaping from this penalty was, a presentment of Englishmen; in other words, a finding by the coroner's inquest, upon the statement of the relations of the deceased, that he was an Englishman; the sole object of the amercement having been the protection of Danes, and afterwards of the Normans, from assassination by English (Glannie; Reeves.) By the law of odo de Odo, which is commonly found in ancient charters of franchises, the right to receive these amercements within the particular districts, passed from the crown to the grantee. Amercements for non-presentment of Englishmen were abolished in 1346, by 1 Edw. III., st. 1, c. 4.

As the law formerly stood, every destruction of human life, not effected in this secret manner, with whatever circumstances of malice and cruelty it might be accomplished, was treated as simple homicide. The law appears to have been gradually altered by the judges, in order to reach atrocious criminals whose offences would not formerly have been punishable as murder. As the law now stands, murder or treason by colour of human right, is punished with an intention on the part of the perpetrator of the offence to kill or do great bodily harm, or willfully to place human life in peril; or resulting from an attempt to commit some other felony; or occurring in the course of resistance offered to military, civil, or other authority, or in an unlawful way of justly engaged in carrying the law into execution. All other cases of culpable homicide, in which death is produced involuntarily, but is occasioned by want of due caution; or where, though death is produced voluntarily, the crime is exculpated by circumstances; or where a minister or officer of justice is killed, but sufficient authority did not exist, or was not communicated to the party before the fatal blow was given; or where any other circumstances essential to the crime are wanting, such homicide is termed 'simple' or involuntary homicide, or, as it is commonly called, without regard to the age or sex of the party killed, manslaughter.

The law recognises the right of taking away life in the necessary defence of person or property, and it admits, in some cases, previous provocation as an extenuation of the offence. On the other hand, it makes special provision for the protection of officers and ministers of justice, where the killing of such officer or minister, though culpable, does not prevent the offence amounting to murder.

In the modern law of England the crime of murder is characterised by having been committed with malice aforethought, or, as it is sometimes called, malice prepens; which term implies, or gives notice of, a premeditated design to kill, or to make the party (with the intent to kill) guilty of a sudden or involuntary homicide, or, as it is commonly called, without regard to the age or sex of the party killed, manslaughter.

The term 'malice aforethought' is therefore frequently applied to a state of things in which no malice is felt in the ordinary sense of the term, but is only malice in a legal sense, by construction of law.

If A shoots at B with intent to kill him, but by mere accident kills C, this is a killing from implied malice. If A, by throwing a heavy stone from the roof of a house into the street in which he knows that people are continually passing, kills B, a mere stranger, this also is a killing from implied malice.

Impaired malice is however very loosely defined in the law of homicide, and is to be defined, it is stated, that the existence of impaired malice is a pure question of law, or a conclusion of law to be drawn from all the circumstances of the case; and it is in some cases made to depend upon a very abstruse technical doctrine. The existence or imputation of impaired malice, even when it is asserted that intention has no reference to any personal injury, but happens to be accompanied with a killing which is altogether accidental, is made to constitute the distinction between the higher and lower species of culpable homicide; and in other cases the existence of such criminal intention brings even an accidental killing within the scope of manslaughter.

Mr. Justice Foster says, When the law makes use of the term 'malice aforethought,' as descriptive of the crime of murder, it is not to be understood in that narrow restricted sense in which the modern law is apt to lead one, a principle of malevolence to particular, for the law, by the term 'malice,' in this instance, means that the fact hath been attended with such circumstances as are apt to indicate a wicked, depraved, or malignant spirit. The malus animus, which is to be collected from all circumstances, and of which the court, and not the jury, is to judge, is that which bringeth the offender within the denomination of wilful malicious murder. And I believe that the law, not all the cases in our books are ranged under the head of implied malice, will, if carelessly adverted to, be found to turn upon this single point—that the fact hath been attended with such circumstances as carry in them plain indications of a heart regardless of social duty and fatally bent upon mischief. (Discourse on Homicide, 256, 257.)

This vague and figurative description of that which is propounded as a legal definition appears to furnish us with a certain test of the crime of murder. It amounts to no more than this: that, to constitute the crime of murder, the act must have been attended with such circumstances as in the opinion of the court, and not of the jury, are the ordinary circumstances in which the act is done, of such a heart, regardless of social duty, and fatally bent upon mischief. It is a description of that which is rather matter of fact than of law. The question in each particular case is, whether the party acted in wanton and wicked disregard of the probable consequences of his act, and their probable operation upon the peace and convenience of human life; which is an inference to be deduced from the evidence, and in arriving at which no assistance can be derived from the application of mere technical rules.

The presence of that evil disposition of the mind of the offender which makes the offence murder, is known only by evidence of an act or omission by which human life is wilfully or wantonly exposed to peril.

Every homicide is presumed to be malicious until the contrary is proved. The principles of investigation, circumstances may transpire which extenuate the offence, and reduce it from the crime of murder to that of manslaughter, or the act may appear to amount either to justifiable or excusable homicide. In cases of justifiable homicide, and according to modern practice, in cases of excusable homicide, the party causing the death is discharged from responsibility.

To constitute legal homicide, the death must result from injury to the person (as contradistinguished from causing operating upon the mind) occasioned by some act done by, or some unlawful omission chargeable upon, the party to whom such homicide is imputed. The term 'wilful omission' applies particularly to simple omission to prevent an injury which the party may be under a legal duty to prevent, such as a failure to prevent clothing, or to furnish any other assistance, or to do any other act, for the support of life or for the prevention of injury to it. It is not homicide unless death take place within a year and a day after the injury; or, in other words, not considered homicide when the party injured survives a whole year, exclusive both of the day of the injury and of the day of the death; nor where the death is to be attributed to unskillful treatment, or other cause not resulting from or aggravated by the injury sustained.

The law of homicide applies to the killing of aliens, except alien enemies slain in the heat of war; and to felons, except when executed according to law, and to persons outlawed, whether on civil or on criminal process. But a child in a cradle or as a part of his mother's womb is not a subject of homicide, unless, subsequently to the injury, it be born alive, and die, within a year and a day from the time the injury received whilst yet unborn. [Infanticide]

Criminal homicide is one of three kinds, murder, manslaughter, and self-murder. [Suicide.]
3. Homicide, whether voluntary or involuntary, committed in unlawfully resisting officers or ministers of the law, or in unlawfully using force or violence to resist, or in unlawfully aiding in the advancement or in the execution of the law.

11. Manslaughter consists in:

1. Voluntary but exasperated homicide, committed in a state of provocation, arising from a sufficient cause.

2. Involuntary homicide, not excusable as being occasioned by mere inadvertence.

This second class may be subdivided into:

1. Involuntary homicide, resulting from some act done, or from the willful omission to do some act, with intent to occasion bodily harm.

2. Involuntary homicide, resulting from some wrongful act done to the person.

3. Involuntary homicide, in committing, or in attempting to commit, an offence attended with risk of injury to the person.

4. Involuntary homicide, resulting from some act done without due caution, or from the unlawful omission to do some act.

Homicide not criminal is:

1. Justifiable, as done for the advancement or in the execution of the law; or

2. Excusable, as done for the defence of person or property; or because it has, without the fault of the party, become necessary for his preservation.

The offence is extenuated where the act, being done under the influence of excitement from sudden provocation, or of fear, or of alarm, which may, for the time, suspend or weaken the powers of judgment and self-control, is attributable to transport of passion or defect of judgment so occasioned, without any deliberate intention to kill or do great bodily harm; regard still being had to the nature and extent of violence used by the party inflicting the injury, which was delivered to suit the case as compared with the cause of provocation.

The offence is not extenuated where, the cause of provocation being but slight, a return is made so excessive and disproportionate, that the killing cannot be attributed to mere heat of blood arising from the provocation given.

Homicide is neither justifiable nor extenuated by reason of any consent given by the party killed, as in cases of duels.

Homicide is justifiable, where the act is done in a lawful manner, by an officer or other person lawfully authorized, in execution of the sentence of a court of competent jurisdiction.

Homicide is justifiable, where an officer of justice, or other person duly authorized to arrest, detain, or imprison for any felony or for any dangerous wound given, and using lawful means for the purpose, cannot, otherwise than by killing, overtake the party in case of flight, or prevent his escape from justice; provided the officer knew, or had reason to believe, that the party attempting to escape was aware that he was pursued for such felony or wound given.

Also, where any officer of justice, or other person lawfully executing in a lawful manner any civil or criminal process, or other authority for the advancement of the law, or interfering in a lawful manner for the prevention or suppression of any breach of the peace or other offence, is unlawfully and forcibly resisted, and using no more force than is necessary, or in a reasonable manner, happens to kill the party resisting; or being, by reason of the violence opposed to him, under reasonable fear of death if he proceed to execute his duty, and because he cannot otherwise both execute his duty and preserve his life, kills him who so resists—in either of these cases the homicide is justifiable.

Homicide is also justifiable, when necessary for preventing the perpetration of any felony attempted to be committed by violence or surprise, or unlawful possession of movable property; and where one, in defence of movable property in his lawful possession, using no more force than is necessary for the defence of such property against wrong, happens to kill the assailant; or being, from the violence of the assailant, and in his lawful possession, and as a sentinel, either, cannot otherwise both defend his property and preserve his life, kills the assailant: also where one in lawful possession of house or land, after requesting another, who has no right to be there, to depart, is resisted, and using no more force than is necessary to remove such wrong-doer and retain his possession, happens to kill such wrong-doer or being, from the violence with which such wrong-doer endeavours to deprive him of possession, under reasonable and just apprehension that he cannot otherwise both maintain possession and preserve his life, kills such wrong-doer.

Homicide is excusable, when a man is involuntarily placed in such a situation that he is under the necessity of killing another in order to save his own life; as where, in a shipwreck, A pushes B from a plank which can save one only.

Homicide is not criminal, when it occurs in the practice of any lawful sport or exercise with weapons not of a deadly nature, and without any intent to do bodily hurt; and where no unfair advantage is intended or taken. But it amounts to manslaughter where weapons are used, the use of which is attended with probable danger; or where, in case of friendly contest, without the use of such weapons, death results from any unfair advantage taken, either as regards the nature of the instrument, the mode of using it, the want of due warning given previously to violence used, or from any want of due caution. Tournaments, though a sport in which deadly weapons were used, yet, being considered a useful and harmless sport to armies, were lawful if consented to by the consent of the king. In case of death therefore, in the course of one of these exhibitions, the criminality of the act appears to have depended upon the royal licence for the holding of the tournament.

The statute of 9 Geo. IV., c. 31, s. 3, enacted, that every person convicted of murder, or of being accessory before the fact to murder, shall suffer death; and that every accessory after the fact to murder, shall be liable, at the discretion of the court, to be transported for life, or to be imprisoned, with or without hard labour, for any term not exceeding four years. By an act passed in 1752 (25 Geo. II., c. 37), the bodies of persons executed for murder were directed to be dissected for the use of surgeons in anatomy, on the discharge of chains.

The 2 & 3 W. IV., c. 75, required that such persons should be hung in chains, or buried within the precincts of the prison. The 4 & 5 W. IV., c. 36, s. 1, has taken away one part of the alternative, and the mode of burial is the only circumstance which distinguishes sentences upon a conviction for murder from those pronounced in other capital cases. Formerly the murder of a bishop, abbot, or prior, by a person owing him canonical obedience, a master or minister, or by a servant or a tenant, was substituted for hanging; but by the 9 Geo. IV., c. 31, s. 2, petty treason is to be treated as murder only.

The offence of manslaughter is punishable with transportation for life, or for not less than seven years, or with imprisonment, with or without hard labour, not exceeding four years, with fine, by 9 Geo. IV., c. 44, s. 9. (Foster; East; Fourth Report of Criminal-Law Commissioners.)

MUR, SIR WILLIAM, of Rowallan, in the county of Ayr, was born about the year 1594. He was the eldest son and heir of a knight of the same name, and the family to which he belonged was one of the most antient and distinguished in that part of the country: it terminated in Jane Mure, great-grandmother of the present countess of Eglinton. Ten mourning columns, representing ten of the twelve life memorials have been preserved. It would appear however that his character and genius were soon developed: there is a specimen of his verses in English, dated in 1611, when he could be little more than seventeen years old; before his twentieth year he attempted a version of the classic story of Dido and Æneas; and in 1617, when he was scarce four-and-twenty, he addressed the king at Hamilton, on his progress through the country, in a poetical piece which is buried in the doubtful person, habitation, or property: and where one, in defence of movable property in his lawful possession, using no more force than is necessary for the defence of such property against wrong, happens to kill the assailant; or being, from the violence of the assailant, and in his lawful possession, and as a sentinel, either, cannot otherwise both defend his property and preserve his life, kills the assailant: also where one in lawful possession of house or land, after requesting another, who has no right to be there, to depart, is resisted, and using no more force than is necessary to remove such wrong-doer and retain his possession, happens to kill such wrong-doer or being, from the violence with which such wrong-doer endeavours to deprive him of possession, under reasonable and just apprehension that he cannot otherwise both maintain possession and preserve his life, kills such wrong-doer. During the civil war, Sir William took the popular side.
and in the first army raised against the king, he commanded a company of the Ayshire regiment. He was a member of the convention in 1653, when the solemn league and covenant was ratified with England; and that same year he acceded, in terms of that treaty, were despatched in aid of the parliament. He was also present, and wounded, in the decisive battle of Long Marston Moor; and in the succeeding month he was engaged at the storming of Newcastle, in which the chief union officer being killed, he had for some time the command of the regiment. Little further is known of him, except that on the revision of Roos's Psalms by the General Assembly in 1650, a version by Mur of Rowallan is spoken of as employed by the committee appointed for the improvement of the psalmody. He died in 1657.

By far the greater portion of Sir William's writings remain in manuscript. Various specimens of his compositions however, may be found in several of the ancient Ballads and Songs, chiefly from Tradition, Manuscripts, and scarce works, with Biographical and Illustrative notices, including Original Poetry, by Thomas Lyne, London, 1827; to which Chambers owns himself indebted for the materials of his notice concerning Sir William in his 'Biographical Dictionary of eminent Scotsmen.' To this latter we also refer.

MURET, MARC ANTOINE FRANÇOIS (Muret-Tus in the Latinized form of his name), was born near Limoges in 1529. He learnt, with great facility, Greek and Latin, and at the age of eighteen gave lectures on Cicero and Terence in the college of Auch. He afterwards went to Paris, where he taught philosophy and the civil law with great success. Being accused, according to Seiliger and some others, of an unnatural vice, he quit Paris for Toulouse, which he was also obliged to leave. He proceeded to Italy in the greatest disgrace and on his journey fell ill at an obscure inn on the road. The medical men of the place, having examined his condition, proposed among themselves in Latin (which they thought he did not understand) to try upon him some new experiment: 'Faciamus experimurum in cautelam, ut sic sustineas, that he mustered strength enough to pursue his journey.

All this account however is contradicted, or rather discredited with disdain by his biographers, F. Benci and Lazeri, whose notices of Muret's life are annexed to Ruhmkorff's edition of Muret's works. 4 vols. 8vo., Lozayen, 1789. It is certain however that Muret repaired to Venice in 1554, where he became intimate with Paolo Manuzio, who published several of his commentaries on the classics. In 1559, he accepted the invitation of Cardinal Ippolito d'Este, and went to live with him at Ferrara, and afterwards accompanied the cardinal to Rome, from whence he repaired to France with the papal legate in 1562. In the following year he returned to Rome, where he was again esteemed by Pope Pius V. and his successor Gregory XIII.

He entered into holy orders, obtained several benefices, and was appointed professor of philosophy, and afterwards of civil law at Rome. He died at Rome in 1581. His principal works are:--1. 'Commentarius de Origine Juris;' 2. 'Commentarii de Legibus, Senatusque Consultis, et Longa Consuetudine;' 3. 'Commentarii in Titulos ad Materiam Juris, dictio numeri pertinente;' 4. 'Notae in Justiniani Institutiones;' 5. 'Oratones.' Several of these are funeral eulogies in the usual laudatory style of such compositions. In that on the occasion of the death of Charles IX., king of France, delivered at Rome in 1574, he praises that king for having extirpated heresy in his kingdom. In fact Muret was a learned scholar, but he did not small mean a philosopher. His 'Poemata' have grace and fluency, but little of invention or poetical genius, excepting perhaps some of his epigrams. But his commentaries and scholium upon 'Politiis' and 'Rhetorica' are celebrated. His 'Republica' on Cicero's ('Catailinarii and Philippi,' on Seneca's 'Epistles,' on Sallust and Tacitus, on Terentius, Catullus, and Horace, are truly valuable, as well as his nineteen books 'Variarum Sectiunum' of different classical authors.

MURCOTOMA.

MURIDAEC. [CHLORINE.]

MURIDE, the name of an extensive family of Rodents, comprising, when taken in its largest sense, a great number of species, which, though some of them have not to any considerable size, become worthy of serious notice from their prodigious multiplication and the destructive influence which they exert over vegetation and the frames of the agriculture of the country.

The Lepontine genus Mus is thus characterised in the last edition of the 'Systema Naturae':--"Dentes praesentis inferioris subiurisat;" and, as might be expected from such a definition, it is made the receptacle not only for all the rodents which are vermicelliform as known to science, but for the numerous genera Plata, the Agusia, the Paca; in short for all the genera Hysterix, Lepus, Castor, and Sciurina. The remaining genus (Nectilis), placed by Linnaeus under the Rodents, belongs with the Mus, and bears the generic title (Murex) all the rodents provided with claws which had no striking external distinction, such as the tail of the squirrel or the beaver.

Guided separated from this crowd of rodents the Murmots (Arctomys), the Dormice (Myocastor), and the Jerboas (Dipus).

Cuvier, in the last edition of the 'Regne Animal,' carries this subdivision much further, adopting the following subgenera, under the great genus Mus, or the Rats and Mice--Arctomys (Arctomys, Gm.); Marmots (Arctomys, Gm.); the Dormice (Myocastor, Gm.); and the Jerboas (Dipus, Gm.). To these succeed the Jumping Hares (Hylocercus, F. Cuv.); the Jerboas (Dipus, F. Cuv.); and the Jerboas (Dipus, F. Cuv.).

Mr. Gray, in his 'Outline' (Ann. Phil., 1825), after observing that the 'Glises are exceedingly difficult to arrange, and that the arrangement given is only an attempt according to his judgement,' states, that the first family is a division of the order, with the following character:--"Cutting two in each jaw, lower awl-shaped, grinders simple or compound, upper sheathing backwards, lower in the first division, but in the second laciniate, tail scaly, fur with scattered longer hairs, or flat spinous, claws distinct."

He then subdivides the family as follows:

++ Grinders rootert, simple.
1. Murina.--Mus, Lin.; Otomy, F. Cuv.; Capromys, Desm.
2. Hydromys.--Hydromys, Geof.++
3. Ondatra.--Ondatra.
4. Casterina.--Caster, Lin.; Osteopara, Harlan
5. Castorina.--Echymys, Geof.; Heteromys, Desm.
6. Saccomys, F. Cuv.

Dr. Fincher, in his 'Conspicuous Ordinum et Generum' (1829), divides the Glises into two sections: the first containing those of with complete clavicles; and the second free. The following genera are thus arranged under the first section:--Caster, Lemmings; Spalacina, Spalacina, Lemmings, Myocastor, Hystrix, Castor, Myocastor, Myopotamus, and an observation in a note to the first section, that these divisions are purely artificial, and merely formed to facilitate the arrangement among so many unarranged groups, we find the following sections:

1. Rats and Mice, under which are arranged the following genera:--Arvicular, Laep., (Hydromys, Gm.); Exomys, Mus Amphibius, Lin., Water-Rat, Penn.; Gyracys, Lemminia, Example, Mus Musericanum, Lin., Dipus, Commerson, Echymys, Geof. (Spined Rats), Ex., Echymys cristatus, Desm., Flattened Dormouse, Penn.; Myoxus, Mus (Dormouse), Ex., Mus uresilutinaris, Lin., the C..."

2. Fore-legs very short, hind-legs long. Jumping Mice; under which come the following genera and subgenera:—


The numerous forms which press upon the attention in considering this large section of Mammalia are enough to convince any one who has bestowed any thought on the subject that authors have not spoken of the difficulties surrounding it without reason; we shall therefore introduce the student to the most remarkable among them, and, adopting Mr. Swainson's names for the three first sections as arbitrary and in which under which we may bring the structure and habits, where they are known, of these animals before the reader, proceed to examine the natural history of this great and destructive group.

Rats and Mice (popularly so called).

**Genus Arvicola.**

**Generic Character.**—Ears moderate. Muzzle obtuse. Anterior toes armed with moderate claws. Tail round and hairy, not so long as the body. Number of testis from eight to twelve. Molars composite with flat crowns, presenting angular enamelled laminae.

**Dental Formula:**—Incisors 2 2 molars 3 \[= 16.\]

**Teeth of Arvicola.** (F. Cuv.)

Cuvier divides the great genus Arvicola of Lacépède (*Conspagation*) into the Ondatras (Fiber, Cuv.) *Musquarna*, and the Conspagation Ordinaires (*Arvicola*, Cuv.; *Hyposmus*, Ill.) and so they stand in Cuvier's last edition of the \(^\text{*Regne Animal*}\) of M. Lesson, in his \(^\text{*Manual*}\) states that Cuvier has formed two subdivisions of the Arvicola, namely, first, the Conspagination naga, of which M. Lesson gives Arvicola amphibius, Desm., *Mus amphibius*, Linn., as an example; and second, the Conspagation Terrestres, which may be exemplified by Arvicola agrestis.

Adopting this subdivision of Arvicola in its restricted sense for convenience, there is hardly sufficient difference in the structure, whatever may be in habits, to justify the breaking the true Arvicola down into two groups, we shall, before we proceed to the description of the examples given, detain the reader; there are shortly the views of two modern English naturalists of no note with respect to the Arvicola.

Mr. Gray raises this group to the rank of a family under the name of Arvicolidae, and under it places his genus Ctenodactylus, by a word, by the way, which comes up to Dejaren's name for a genus of Coleopterous insects, Ctenodactyla. [Ctenodactylus, Ctenodactyla.] N.B. Mr. Yarrell is of opinion that Ctenodactylus Masonii of Gray, is, as suggested by Mr. Ogilby, identical with the Mus Guidi of Rothman, on whose description is founded the Arctomy Guidi of Gymel and others, and the Guandi Mars of Pennant's Zoology.

Mr. Bell, in his British Quadrupeds, observes that the direction of the tail with the latter, the *Mus* involves an inconsistency which was early detected, and the correction of which has been universally recognised and followed. The characters of the teeth, he remarks, as well as the general form of the body, and the habits of all the species, remove them not only generically from the Soricidae, but even point out their association with a different family of the Rodentia, and their affinity to the beaver, he adds, appears to have forcibly struck Linnaeus himself, who, in his Fauna Sueca, applied the name Castor to the European Water Vole, or Water Rat. Mr. Bell then continues thus: 'The generic term Arvicola, if not absolutely unobjectionable, must be retained, as having the sanction of priority over the name Microtus of Schrank, Hypmoderus of Brant, or Lemmus of F. Cuvier. With regard to the name of the family, I have ventured to change that of Mr. Gray, Arvicolidae, to Castoridae, because the genus Castor must be considered as the type of the family, of which the present can only be an aberrant form.' [Beauv.]

§ 1. Water or Swimming Arvicola or Voles.

The author last quoted gives the following synonymy for—


**Description.**—Head thick, short, and blunt; eyes small, not very prominent; ears short, scarcely conspicuous beyond the fur; the cutting-teeth of a deep yellow colour in front, very strong, chisel-shaped, considerately resembling those of the beaver; the surface of the grinding-teeth formed of alternate triangles arranged on each side of the longitudinal axis; fore-feet with four complete toes, the last phalanx only of the thumb being conspicuous beyond the skin; hinder feet with five toes not webbed, though connected to a short distance from the base; tail more than half the length of the body, covered with hairs, of which those on the inferior surface are rather long, and probably assist the animal in swimming by forming a sort of rudder of the tail. Fur thick and shining; of a rich reddish-brown mixed with grey above, yellowish-grey beneath. Dimensions.—Length of the head and body 8 in. 4 lines. 'the head 10 ' the ears 0 ' the tail 4 8 ' (Bell.)

This appears to be the Sorgo morgane of the Italians; Wasser-maust-Rat of the Germans; Water-rot of the Dot; Waters rotte of the Swedes; Bed-rotte of the Danes; *Llugoden y defy* of the planters of Brechin; and Water Vole and Water Rat of the modern British.

Ray names it *Mus major aquaticus*, seu Rattus aquaticus, and he, as well as Linnaeus, states that the Water Rat is web-footed. This, or rather White of Stappen, who, in one of his letters to Pennant, writes, 'Ray says, and Linnaeus after him, that the water rat is web-footed. But now I have discovered a rat on the banks of our little stream that is not web-footed, and yet is an excellent swimmer and...
species are given by Mr. Bell:—Mus agrestis brachycercus (Ray).—Mus agrestis (Linnaeus).—Lemmus ocellatus (Cuv.).—Arvicola vulgaris (Dec.).—Arvicola agrestis (Pallas).—Arvicola arvalis (Belys. Longchamps).—Campagnolus (Bull.).—Short-tailed Field Mouse (Penn.).—Meadow Mouse (Shaw.).

December, 1877, Mr. R. Yerrell wrote large that the field mice just appearing above the fur; body thick and full; tail more than one-third the length of the body, sparsely covered with hair; thumb of the fore feet rudimentary, without a claw. Upper parts reddish brown, mixed with grey on the sides; under parts ash-colour; feet and tail dusky.

Dimensions:—

Length of head and body—4
Length of tail—3

This appears to be the petit Rat de Champagne and Le Campagnol of the French; Campagnolo of the Italians; Slaver Mus of the Deyes; Lygodon guttae musen of the ancient Britsh; Field Vole, Short-tailed Field Mouse, and Meadow Mouses of the modern Britsh.

Habits, Food, &c.—Small and insignificant as the animal is in appearance, there is scarcely a species among the rodents more destructive to the gardens, fields, and woods, which has been rendered fruitful by the都市er ancestry of man, than the Short-tailed Field Mouse. In the corn-field, in the rick-yard, in the granary, in the extensive plantation, its depredations are often severe, and sometimes ruinous. It is known that the following species damage these mice are capable of doing when they become multitudinous. Lord Gisborne, in a letter to Sir Joseph Banks, dated 30th June, 1814, observes that the whole body of Dean and New Forests appeared to be numerously stocked with mice; at least, when the large furze-brooks in the open parts had been burnt, their holes and run covered the surface. Haywood Hill, a new plantation of about 300 acres, in the forest of Dean, was particularly ravaged. There were open espaces, where large groups of these mice were found, and in the following spring about one-third came up; the rest of the seed having probably been destroyed by mice principally. The young shoots of the natural hollies of the tract, which had been cut down to favour the plantation, were not attacked; but the large furze-brooks in the winter of 1811, though their runs were numerous. In the autumn of 1812 a large quantity of five-years-old oaks and chestnuts, with ash, larch, and fir, were planted in the same country. In the winter there were but few members of the forest, then two, three, or more feet high, were barked round from the ground to four or five inches upwards, and died. In the spring of 1813 a number of the oaks and chestnuts were found dead, and when they were pulled up it was observed that the roots had been cut through two or three inches below the surface of the ground; many were also barked round and killed, like the holly-stocks; whilst others, which had beenbegun up, were sickly. The evil now extended to the other trees; and becoming very serious both in the Dean Forest and the New Forest, cats were turned out, the buses, fers, rough grass, &c. were cleared away to expose the mere to beams and birds of prey, in greatest variety were last and seven or eight different sorts of traps were set for them, some of which, made of tin, succeeded very well. These were however superseded by the plan of a profesed cat-catcher, who, having been employed to catch the mice, had observed, on going to work in the morning, that some of them had been pulled up into wells or pits, accidentally formed, and could not get out again; many of them dying from hunger or fatigue in endeavouring to climb up the sides. Such pits were therefore, on his recommendation, immediately tried: they were first made very deep, three or four, and wide; but these were found to be unnecessary; large, and, after various experiments, it appeared that the answered best when from eighteen to twenty inches deep at the bottom, about two feet in length, and one foot and half in width, and, at top, only eighteen inches across. If nine wide, or indeed as small as the earth could be got out of a hole of that depth; for the wider they are below and the narrower above, the better they answer their purpose. They were made about twenty yards in diameter, or about

Mr. Hug suggested the generic name Acriselurus for the small, from the res epitoming property.

Arvicola Agrestis.—The following synonyms of this

* It is more sinister than sinning in this respect; for the quadruped is always to be feared, and by the very large tongue.

For the former fish it is by no means a bad fish, if it is not greatly injured.

Geographical Distribution.—Most parts of Europe.

Mr. Bell, who gives a very good figure of the Eommon Water Vole, or Water Rat, remarks that a black variety of this species has long been known, and that it has been described by Pallas and other continental zoologists. Mr. Bell observes that this is probably identical with the quadraped described by Mr. Macgillivray in the sixth volume of the 'Transactions of the Wernerian Society of Edinburgh,' under the name of Arvicola ater, as very common in the counties of Banff and Aberdeen. The Water Vole is a very small animal, and, generally speaking, has but one breed, consisting of five or six; these are ordinarily born in May or June, when the vegetation is well forward; but the young are sometimes produced as early as April, in which latter case there is a second litter towards the end of summer or beginning of autumn. The flesh is said to be eaten by the French peasants on maturing days.

The habits of the latter agree with those of the

Water Vole. Mr. Macgillivray however thinks that there are sufficient differences in the organisation and colour of these two animals to warrant specific distinction. Arvicola ater is stated to be deep black above, and black with a tinge of grey beneath; in size somewhat smaller than the Common Water Vole, but the difference of the proportions is scarcely appreciable. Mr. Bell observes that this author believes that there is a white vertebral spot; but Mr. Yerrell does not, on a comparison with several of the common rats, appear to Mr. Bell to justify this supposition.

Mr. Jenyns, continues Mr. Bell, 'states that the black variety is not uncommon in the south of England, and differs in no respect from the other but in colour; a testimony which weighs against the opinion of its being specifically distinct, when we consider the great accuracy of that gentleman's observations.'

Terrestrial Arvicoles.

Arvicola Agrestis.—The following synonyms of this
are, in the upper jaw of Octodon, on each side, four; the hindermost being the smallest, and that in which the peculiar form is least strongly marked. In Clitomys, all the molar teeth, both of the upper and the lower jaw, correspond with the structure that exists in the upper jaw of Octodon, excepting that their crowns are more slender and more obliquely placed, whereas the external carination becomes less sharply defined; and also excepting that the hinder molar in each jaw is so small as to be almost incipient: as generally the case, however, the relative position of the teeth is coordinated, and the efficiency in the outline of the crown of the tooth, which in the upper jaw is external, is, in the lower jaw, internal. In the lower jaw of Octodon the crowns of the molars assume a figure very different from those of the upper, dependent chiefly on the prolongation of the hinder portion of the tooth to the same lateral extent as its anterior part; each of them consists of two cylinders, not disposed in the middle where the bony portion of the crown is continuous, but partially separated by a fold of enamel on either side producing a corresponding notch; placed obliquely with respect to the jaw they resemble, in some measure, a figure of 8 with its elements flattened obliquely, pressed towards each other, and not connected by the transverse middle bars. With the lower molars of Octodon those of Physagomya, as figured by M. F. Cuvier, correspond in structure in both jaws. Octodon thus exhibits, in its dissimilar molars, the types of two genera: the molar of its upper jaw represents those of both

Geographical Distribution.—Europe.

Mr. Bell is of opinion that the Arvicolia riparia of Yarrell (Zool. Proc., 1832) is no other than the Arvicolia pratincola of Baillon and the Arvicolia rufescens of Selys-Longchamps.

Octodon.

Mr. Bennett observes that 'In the structure of its molar teeth, Octodon may be regarded as occupying an intermediate station between Physagomya and Clitomys. In Octodon the molars of the upper jaw differ remarkably in form from those of the lower. The upper molars have on their inner side a slight fold of enamel, indicating a groove ten, the same measure to separate on this aspect the mass of the tooth into two cylinders: on their outer side a similar fold penetrates more deeply, and behind it the crown of the tooth does not project outwardly to so great an extent as it does in front. If each molar tooth of our specimen were regarded as composed of two partially united cylinders, slightly compressed from before backwards, and somewhat oblique in their direction, the anterior of these cylinders might be described as entire, and the posterior as being truncated by the removal of the outer half. Of such teeth there
MUR 500 MUR

jaws of Ctenomys; those of its lower jaw correspond with the molars of both jaws of Poephagomys.

Octodon Cumingii, Benn. (Dendrobius degus, Meyen.)

In size and shape generally resembling the Water Rat, with which Mr. Bennett thinks that it is nearly connected systematizically. All the feet with five toes, but the innermost both before and behind very short, and separated by a wide interval from the rest. Upper surface and sides brownish grey, intermixed with frequent indistinct and undefined spots and patches of dusky black. Colour slightly darker towards the rump, and upper surface of the entire tail, together with its under surface for one-third of its length from the tip, approaching closely to black. Under surface of the body dusky grey, mingled with a shade of brown, lighter and nearly white beneath the base of the tail, and deeper on the breast and the neck, where it becomes almost of the same general hue as the upper surface.

Habits.—Mr. Cuming thus describes the habits of Octodon Cumingii in its natural state. "These animals burrow in the ground, but always under brushwood fences or in low thickets. They are so abundant in the neighbourhood of Valparaiso, that in the high-road between that place and St. Jago more than a hundred may frequently be seen at one time in search of food. Sometimes, but not often, they are observed on the lower branches of the shrubs, and on those which form the fences. They fly at the least alarm, and in running carry their tufted tails like a bent bow. A species of Horned Owl feeds principally on these pretty little creatures." Mr. Bennett adds that two living specimens brought by Mr. Cuming from Chili, were placed by him, in 1831, in the Society's Menagerie: one of them escaped, but the other was alive when Mr. Bennett wrote (December, 1833), and was as active and lively as it was on its first arrival. They were rather shy, and had but little playfulness. They leaped readily and without any appearance of exertion from the floor of their cage to a narrow perch placed at the height of nearly a foot, and there remained seated at their ease. Their food was vegetable.

Locality.—Chili, near Valparaiso, where Captain King informed Mr. Bennett that he had seen thousands of them. (Zool. Proc. and Zool. Tran.)

Ctenomys.

Dentition, &c., see cut above.

Ctenomys Magellanicus. In general form seems nearly to resemble Octodon Cumingii. Toes five, the innermost, both before and behind, much shorter than the others. Tail sparingly haired, but comparatively shorter than in O. Cumingii, and destitute of any marked tuft of longer hairs at its extremity. Upper surface and sides brownish grey tinged with yellow, and hardly varied by blackish; in short the same as that of Octodon, but of a lighter tint. Colour of the belly lighter than the upper surface; chin and throat pale fawn; short hairs of feet and tail almost white.

Length of head and body, 7 in 5 inches: of the tail 2 75.

Habits, &c.—Captain King's memorandum on the subject of this animal are: 'From the size of the jaw, as compared with the abundant remains of this little animal which are scattered over the surface of the ground, I think that the present specimen is rather a young one. On examining the teeth I find that it cannot be referred to any of the genera of the M. F. Cumber's collection. In his arrangement of the teeth, I am unable to find any similar: in all the specimens which I have seen the incisive teeth are grand; the molars are smaller; the cusps are more or less broad; the roots of the premolars are broader and shorter than the upper and lower premolars of the rat. It is, however, of a new genus and species, and is taken by the Patagonian Indians. It dwells in holes which it burrows in the ground; and, from the number of the holes, it would appear to be very abundant. Mr. Darwin (Journal and Remarks) gives an account of its general appearance and chart of the island of this, well describes as a rodent with the habits of a mole. The Tucutuco, says that author, 'is extremely abundant in some parts of the country, but is difficult to be procured, and still more difficult to be seen when at liberty. It lives almost entirely under ground, and prefers a sandy soil with a gentle inclination. The burrows are said not to be deep, but of great length. They are seldom open; the earth being thrown up at the mouth into hillocks, not quite so large as those made by the mole. Considerable tracts of country are so completely undermined by these animals, that horses, in passing over, sink above their fetlocks. The tucutucos appear, to a certain degree, to be gregarious. The man who procured specimens for me caught six together, and he said there was never any occurrence. They are nocturnal in their habits; and these principal food is afforded by the roots of plants, which is the object of their extensive and superficial burrows. Azara says they are so difficult to be caught, that he never saw more than one. He states that they lay up much food within their burrows. This animal is universally known by a very peculiar noise, which it makes when beneath the ground. A person, the first time he hears it, a much surprised; for it is not so much the sound as the time it comes, nor it is possible to guess what kind of creature utters it. The noise consists in a short but not rough nasal grunt, which is repeated about four times in quick succession; the first grunt is not so loud, but a little longer, and more distinct than the three following: the whole is constant, as often as it is uttered. The name Tucutuco is given in imitation of the sound. In all times of the day, where this animal is abundant, the noise may be heard, and sometimes the animals directly beneath the voice. When kept in a room, the tucutucos move both slowly and clumsily, which appears owing to the outward action of their hind legs; and they are likewise quite incapable of jumping even the smallest vertical height. Mr. Reid who dissected a specimen carried their hairy body wrought home in spirits, found that the socket of the thigh-bone is not attached by a hyaline membrane; and this explains, in a satisfactory manner, the awkward movements of their hinder extremities. When eating, they put their hind legs directly on their fore paws; they appeared also to wish to drag it at some corner. They are very stupid in making any attempt to escape; when angry or frightened, they utter the tucutuco. Of those I kept alive, several, even the first day, became quite tame, not attempting to bite or to run away; others were a little wilder. The man who caught them asserted that very many are invariably found blind. A specimen which I preserved in spirits was in this state; Mr. Reid concludes to be the effect of inflammation in the mititating membrane. When the animal was alive I placed my finger within half an inch of its head, and not the slightest notice was taken; it made its way however about the room nearly as well as the others.'

Locality.—The exact entrance of the Strait of Magellan at Cape Gregory and the vicinity. (King.) Mr. Darwin says (loc. cit.) that the wide plains north of the Rio Colorado are undermined by these animals; and that near the Strait there are Magellan, where Patagonia blends with Tierra del Fuego, the whole sandy country forms a great waste for them.

N.B. Mr. Darwin further states that at the R. Negro, in Northern Patagonia, there is a kind of the same habits, and the pedant producers of the Maldonado kind, and was repeated only twice instead of three or four times, and was more distinct and sonorous; when heard from a distance it so closely resembled the sound made at
The genus Sigmodon of Say and Ord occupies, in their opinion, a station between the genera Arvicola and Mus, having the habits and some of the external characters of the former, with teeth remotely allied to the latter. The genus Neotoma of the same zoologists, must, in their opinion, be also placed near Arvicola. (See Journal of Nat. Acad. Sc. Phil., vol. iv.; and Zool. Journ., vol. ii.)

Hypuæus. (III.)

Closely allied to the Arvicola, from which they differ but little except in the number of the anterior toes, and in the shortness of the tail, are the true Lemmings.

**Generic Character.**—Molars composite, with an even crown presenting enamelled angular laminae; ears very short; anterior feet generally pentadactyle and formed for digging; tail very short and thickly haired.

**Dental Formula:** Incisors \( \frac{2}{2} \), molars \( \frac{3}{3} \), \( 3 \times 3 = 16 \).

**Example, Hypuæus Norvegicus.**

**Description.**—Head not quite so blunt as in the Arvicola; whiskers long; eyes small but black and piercing; mouth small; ears small; fore-legs short, pentadactyle, but the thumb hardly perceptible though the claw is very sharp; hind-legs pentadactyle; skin thin; head and body black and tawny, irregularly disposed; belly white with a yellowish tinge. Length from nose to tail five inches or thereabouts, \( \frac{1}{2} \) tail half an inch.

This is the Lemmar or Lemmus of Olau Magnus; the Leen or Lemmer of Gexner; Mus Norvegicus vulgaris Lemming of Wormius; Mus Lemmas of Linnaeus; Flattus and Subultus of the Laplanders; Lemmick of the Swedes; Le Lemming of Buffon; Lemming of the British; Lemmus Norvegicus of Desmarest; and Mus Lemmus of Pallas and Linnaeus.

**Habits, Food, &c.**—The ordinary food of the Lemming consists of grass, the reindeer lichen, and the catkins, &c. of the dwarf birch; but at intervals of time, generally once or twice in a quarter of a century, a great army of them appears: pouring onward in vast hosts, they devour every green thing in their path of desolation. Great bands descending from the Kolén, traverse Nordland and Finnmark, ending their journey and their lives in the Western Ocean, which they enter and there perish. Others, taking a direction through Swedish Lapland, are drowned in the Gulf of Bothnia. Their migrations are stated to be in parallel lines about three feet apart, without stop or stay, unless the obstacle is insurmountable: rivers and lakes they cross without deviation, and they are said to gnaw through corn and hay stacks. (Phil. Trans., ii.) Pennant, who states that they appear in numberless troops in Norway and Lapland, where they are the pest and wonder of the country, thus graphic-

* Individuals from Russia and Lapland are said to be less than those from Norway and Sweden.

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**Echimys (Geoff.; Loncheres, Ill. part.)**

**Generic Character.**—Four ungulate toes and a vestige of a fifth on the anterior feet. Tail very long, scaly, and nearly naked. Hair white and brown, those on the upper parts flat and aciculated. Molars with transverse laminae, united to each other by twos at one end or isolated.

**Dental Formula:** Incisors \( \frac{2}{2} \), molars \( \frac{4}{4} \), \( 2 \times 4 = 20 \).
Example.—Echimys chrysurus (Echimys cristatus, Desm.)? The Gilt-tail Dormouse of Pennant; Leroü's mouse of Altmann.

Description.—Ears short and broad, whiskers strongly developed, a gold-coloured line extending longitudinally from the nose to the space between the ears; head, body, and upper part of tail maroon or shining purplish chestnut, ruddy marginate braits being scattered between the hairs, which give the splendour to the animal; lower part of tail, which is thick at the base and longer than the body, golden. Length from nose to tail, five inches.

Habits, Food, &c.—This species is said to climb trees, and live principally on fruits.

Locality, Surinam.

Cercomys. (F. Ouvier.)

Generic Character.—In shape resembling the Black Rat, but with the cinnaemon more arched and the ears larger. Anterior limbs considerably shorter than the posterior, which are terminated with five toes, the middle three ones longest; the anterior with four only, and the rudiment of a thumb with a small flat nail; all the other toes with compressed nails curved and pointed, and seeming more proper for climbing than burrowing. Tail very long, and like that of the Brown Rat. Fur composed of long, straight, firm hairs of a uniform texture, and of hairs which are finer, softer, and much thicker; no bristle as in Echimys. Molars with three large large and two small, and their slightly elevated crowns nearly circular, presenting at the surface a notch and three ellipses surrounded with enamel, as is the tooth itself. The notch is on the internal side in the upper molars, and on the external side in the lower molars. Great suborbital hole considerably extensive.

Dental Formula:—Incisors 2 2, molars 4 4 = 20.

Example, Cercomys anturicarius.

Description.—Deep brown above, paler on the sides and the sides of the cheeks; jaws and neck beneath, as well as the under parts generally, white. Eyes and ears large.

Locality, Brazil.

Cercomys crystalssofarus.

Myxus. (Schreber; Gmelin.)

Generic Character.—Four toes and the vestige of a fifth on the anterior feet; five toes behind. Fur very soft and fine. Tail very long, sometimes well clothed with hair and round, sometimes depressed, and sometimes tufted at the extremity only. Molars with transverse ridges of enamel projecting and hollowed.

Dental Formula:—Incisors 2 2, molars 4 4 = 20.

Example, Myxus arendarianus.

Description.—Head proportionally large; eye large, black, and prominent; muzzle not blunt; ears broad, about one third the length of the head; body plump and round; tail flattened, the hairs rather long and bushy; head, back, sides, belly, and tail tawny red; length of that of a common mouse.

Young of a mouse-grey, head and flanks only tinged with red.

This is the Muscardin, Croque-noir, and Rat-dor of the French; Muscardina of the Italians; Leorns of the Spanish; *

* Rothe Wald-maus, Hase-maus, and Hase-šniarf of the Germans; Skogemus of the Swedes; Kusel-maus of the Danes; Fathers of the antique British; and Dormouse of the modern British.

Tooth of Myxus, enlarged. (F. Ouvier.)

There is little if any doubt that this species is of the Gile of the Bosman authors. This Piny, in his chapter, "De fragilis glande," &c. (vi. 6), says, "Fugis glandibus muscarum gratissima est... glire ianque sagittat..." and Martial (i. a. 59, "Glieres") writes—

"Nam derelictus hominum et plagiarum laur... Tangere non, quos ne ad mal aduersentur.

Nor does the occasional short awakening caused by a very sunny day, at which the animal is subject, militate against the application of Martial's lines; for the occasional exhalation is the exception to the rule.

Mr. Bell places the Dormouse among the Sciuridae (Squirrels); and indeed zoologists have assigned it to the genus Sciurus and Myxus. In its habits it comes near to the squirrel, but in its dentition it is nearer to the mice. It is in truth one of those forms for which Nature glees from one race of animals to another.

Mr. Bell gives the following synonyms:—Sciurus arenarianus minor (Ray), Sciurus arenarianus (Linnaeus), Sciurus arenarianus (Dent), Myxus arenarianus (Buffon), Myxus arenarianus (Dent), Dormouse (Pennant). He considers the specific name Arenarianus as not well chosen, inasmuch as the hazel-nut is not the principal food of the Dormouse; *

* Deed, he continues, I have never seen any that could gnaw through the shell of that nut when fully ripe and dry.

Habits, Food, &c.—Dense thickets, bushy dells, and tangled hedgerows are the favourite retreats of the Dormouse. There it constructs its easy domicil, and there providently lays up its winter store, consisting of acorns, beechnuts, haws, &c. It seems inclined to be various; and indeed Mr. Yarrell told Mr. Bell that he had seen not less than a dozen, or even more, of their nests built in the shrubs of a thicket. The latter zoologist well describes its habits.

"It takes its food holding it in its hands, and sitting on its haunches like a squirrel,* and often suspending itself by its hind-feet, in which position it feeds so easily and comfortably as in the more ordinary position. Towards the winter it becomes exceedingly fat; and having had a store of food, retires to its little nest, and coiling itself up into a ball, with the tail over the head and back, becomes completely torpid. A mild day calls it into transient wakefulness; it then takes a fresh supply of food and relapses more or less into slumber; and finally awakening in the spring, at which time it has lost much of its fat, it enters upon its usual habits and the enjoyment of the conugal and parental affections. The young, which are generally about four in number, are born blind; but in a few days the eyes are opened, and in a short time they are enabled to be emitted from their mother's bosom.
food independently of the parent's care. I have reason to believe that, in some cases at least, the Dormouse has a second brood early in the autumn, as I have received from one locality in the month of September an adult, one about half-grown, evidently of the spring brood, and three very young ones apparently not more than a fortnight or three weeks old. (British Quadrupeds.) This pretty little animal is nocturnal in its habits. In The Naturalist's Library, III, will be found a well-related instance of its behaviour on being aroused from its nap during the winter. One of them having been taken in its nest in the middle of December, the heat of its captor's hand and the warmth of the room completely revived it, and it timidly seized the furniture, finding no difficulty in ascending and descending the polished backs of the chairs, and leaping from chair to chair with great agility. On being set at liberty it sprang at least two yards to a table. It did not seem alarmed at being taken into the hand. In the evening it was placed with its nest in a box, and the next morning had relapsed into torpidity. Another account in the same volume informs us that a Dormouse, which had been sent a distance of 140 miles, was apparently but little disturbed by its ride. From that time till the 1st of April, 1838, says Mr. Piggot, 'it slept in its snug dormitory, a deal box lined with wool, when it awoke and readily ate of apples and nuts. It is easily alarmed, being more timid than tame, but shows no signs of anger on being taken in the hand. As it sleeps the greater part of the day, I cannot then closely watch its habits; but towards evening it wakes up, and is very lively and frolicsome, running, on being let out of its cage, up the bell-cord, where it will sit for hours in the folds of the knot, timidly watching our movements.'

Geographical Distribution, Europe.

Graphurus. (F. Cuvier.)

Generic Character.—Limbs short, delicate, and not differing much from each other in length. Anterior feet terminated by four nearly equal toes, and with a flat nail on the internal tubercle of the palm, which indicates the thumb. Posterior feet with five toes, the two external, but the thumb principally, the shortest. All the toes armed with pointed, compressed, arched, and strong claws. Tail short, very fleshy, and seemingly thicker at its extremity than at its root. More or eight in each jaw, remarkable for the comparative smallness of their size. The first in each jaw only a linear rudiment; the three following are a little smaller in the lower jaw than they are in the upper, equal in size to each other, with the surface of the crown united, and in this respect resembling those of the Aye-Aye; no figure was traceable, but this may have been from destruction.

Example, Graphurus Capensis.

Description.—Eyes on the sides, as in Myoxus, with which the animal has much relationship; ears round. Fur thick; upper parts of the head, neck, shoulders, back, sides, rump, and upper part of the limbs deep brownish-grey; tip of the muzzle, sides, and lower part of the head and limbs reddish white. A large band of blackish brown from the eyes to below the ears. Lower parts of the body greyish white with a reddish tinge; tail brown, grey, and whitish above, with its extremity entirely reddish white; there is a tuft of white hairs at the upper and anterior part of the base of the ear.

Size of the Lerot, Batf., Mus quercinus, Linn.

Habits unknown. (F. Cuv.)

Locality, Cape of Good Hope.

Delalande brought back from his voyage to the Cape of Good Hope two species of rodents remarkable for their physiognomy, which sufficiently resembles the rats, but differing externally from those animals in having their large ears covered with hairs, the head more rounded, and a short tail, and especially in their dentition.

Dental Formula: Incisors $\frac{1}{2}$; molars $3 \times 2 = 6$

Example, Otomys unisculus. Coffre Otomys.

Description.—The anterior limbs have four complete toes, armed with delicate nails, which are compressed and sharp, and a rudiment of an unguated thumb; the posterior feet have five toes, armed with the same nails, but the two external ones are very short. The tail is but scantily covered with hairs, and is scaly and short. The muzzle is very thick and obtuse, entirely covered with hair, with the exception of a slight ridge round the nostrils, which are small, and approximated to each other below; the eyes are large, as well as the ears, which have an internal projecting membrane, which, when its edges (parois) are approximated, entirely shut the entrance of the auditory passage. The mouth is very small, the upper-lip cleft, and the tongue thick, short, and covered with soft papillae. There are whiskers on the sides of the muzzle and above the eyes. The fur is thick, very soft, and consists of two sorts of hairs; the shortest and most numerous, which determine
the colour of the animal, are woolly, and, when viewed through a microscope, appear to be formed of very small rings, alternately bright and obscure; the others, rare and longer than the first, are also stouter and more stiff; these, when viewed through a microscope, present only a uniform texture, and so it is with the whiskers. The woolly hairs are of a slaty-grey for two-thirds of their length, and then of a yellowish-white, with the point black, whence results the dirty yellow tint with which the animal is coloured above; below, yellowish-white predominates. The very short hairs of the tail are of the colour of those of the back; the extremities have the tint of the under parts. Length about six inches (French), from the tip of the muzzle to the origin of the tail which last measures three inches and a half. Mean height, two inches and a half. (F. Cuv.)

Habits, &c.—The habits of this species do not appear to be known, nothing respecting them having been found in the notes of M. Delalande. M. F. Cuvier thinks that it is doubtless omnivorous, like the rat; but from the size of its eyes, it may be conjectured that its life is not passed in such obscurity as theirs; and from the delicacy of its sharp claws, and the softness of its fur, that it does not burrow

Dental Formula:—Incisors $\frac{2}{2}$; molars $\frac{2-2}{2-2} = 12$.

Example. **Hydromys leucogaster**.

Description.—Fur short, soft, maroon-brown above, white below; tail black at the base and white at the other extremity. Size sometimes twice that of the Common Brown Rat.

M. Geoffroy has recorded two species, that described above, and another with a yellow belly. *H. chrysogaster* the last he states to be nearly one-half less than the *Cospou*, but they are generally considered to be only varieties of the same species. M. Geoffroy speaks highly of the quality of the fur of the yellow-bellied variety, and says that it is more valuable than that of the *Cospou*.

Habits, Locality, &c.—These animals are aquatic, and were found in the islands of D'Entremontaux Channel. That named *H. Chrysogaster* was killed by a sailor at the moment when it was taking refuge under a heap of stones. *H. Leucogaster* was taken in the island Mars, in the same channel.

**Hydromys leucogaster.**

**True Rats and Mice.**

M. F. Cuvier (*Dents des Mammifères*) observes that up to the time of his writing, animals provided with the same teeth as the Rat (*Mus Rattus*), the Brown Rat (*Serratus*) of the French—*Mus decumanus*), or the Mouse (*Mus Mus*—
European Rats and Mice.

The Long-tailed Field Mouse, Wood Mouse, or Mus sylvaticus, and the Harvest Mouse, Mus minutissimus of White, are not so common as Rattus, and are not so agreeable; their color is more uniform, and is of a greyish brown, and they are more sedentary in their habits and their range. The common field mouse is still a mouse, but the Harvest Mouse is a true field mouse, and is found in the fields and woods of Europe.

M. M. Mus musculus, Mus Musculus, Mus Pumilio, &c.

In endeavouring to give a sketch of the swarms of this group, we shall treat of them according to their geographical distribution.

The Long-tailed Field Mouse.—This is the Llygoden grunvi and Llygoden mye of the antiquated British: Le Mus musculus of the Linnean, and the Mus littoralis of the Linnæan, Mus agrestis major (Bris.), and Mus domesticus medius of Ray. The length of the head and body, as given by Mr. Bell, is 3 inches 8 lines, and that of the tail 6 inches 6 lines. Pellatt makes its measurement from a distinct part of the head, and finds it 3 inches 7 lines and half, and the tail four inches. If the last-mentioned dimensions are correct, they must have been taken from a very large individual. Mr. Macgillivray gives the dimensions of three individuals; the length (to the end of the tail of M. M. Mus musculus, Mus Musculus, Mus Pumilio, &c.) was 6 inches 6 lines, out of the next 6 inches 6 lines, and of the least 6 inches only.

The animal is well described by Mr. Bell as larger than the Common Field Vole, but varying considerably in size; the tail is four inches long, the ears long, and the body long and slender. The ears are a light brown, and the tail has a black band on it. The animal is very prolific, bringing forth from ten to seven or eight, and it is not always stunted to one brood in a year. The hoards that it collects in its subterranean retreats (which are sometimes the results of its own labour, but more frequently excavations which it finds ready made, but which it enlarges, such as those under roots of trees, old mole-runs, &c.) are enormous for the size of the animal, and Pennant is of opinion that the great damage done by hogs in rooting up the ground, or 'meeting,' as it is called in some counties, is caused chiefly by the search of the swine for the concealed treasure of this field mouse.

Geographical Distribution.—The whole of temperate Europe, and some parts of Asia and Africa.

The Harvest Mouse. White, of Selborne, who suggests the name of Mus minutissimus, appears to be the first who drew the attention of naturalists to this the smallest of British quadrupeds. He wrote an account of it to Pennant, who called it the 'Less long-tailed Field Mouse' and the Harvest Mouse. It is the Mus musculus of Shaw, and Mr. Bell adds the following synonyms:—Mus minutus (Pall.); Mniol natn (?); and Rat des Motsors (F. Cuv. ; 'Mamm. '); Minute Mouse of Shaw. Description, Food, Habits, &c. —White thus introduces his discovery to the notice of the public, and he has preserved some of the mice mentioned in my former letter, a young one and a female with young, both of which I have preserved in brandy. From the colour, size, shape, and manner of nesting, they are very different from the other field mice. They are much smaller and more slender than the Mus domesticus medius of Ray, and have more of the squirrel or dormouse colour; their belly is white; a straight line along their sides divides the shades of their back and belly. They enter into the wheat-field suspended in the sheaves, abound in harvest, and build their nests amidst the straws of the corn above the ground, and sometimes in hedges. They breed as many as eight at a litter, in a little round nest composed of the blades of grass or wheat. One of the most remarkable parts of their habits is their adjusting them again when the business is over; but she could not possibly be contained herself in the ball with her young, which moreover would be daily increasing in bulk. This wonderful progenitor, an elegant instance of the efforts of instinct, was found in a wheat-field suspended in the head of a thistle. And again: 'As to the small mice, I have further to remark, that though they hang their nests for breeding up amidst the straws of the standing corn above the ground, yet I find that, in the winter, they burrow in the earth, and sometimes build their nest of the grain round, and their grand rendezvous seems to be in corn-ricks, into which they are carried at harvest. A neighbour housed an oat-rick lately, under the thatch of which were assembled near an hundred, and some, and some of them, and found that from nose to tail they were just two inches and a quarter, and their tails just two inches long. Two of them, in a scale, weighed down just one copper halfpenny, which is about the third of an ounce avoirdupois—so that I suppose they are the smallest quadrupeds in this island. A full-grown Mus musculus domesticus weighs, I find, one ounce lumping weight, which is more than six times as much as the mouse above; and measures from nose to tail just three and a quarter, and from ear to ear just three and a quarter inches.

... As my neighbour was housing a rick, he observed that his dogs devour all the little red mice they could catch, but rejected the common mice; and that his cats ate the common mice, refusing the red.' Thus far White. Dr. Gloger describes one of these nests as beautifully constructed of the panicles and leaves of three stems of the common reed interwoven together, and forming a roundish ball, suspended on the living plants about five inches from the ground. The middle of the ball was divided into a roomy and dripping interior, and the middle of it was a small aperture, which appeared to be closed during the absence of the parent, and was scarcely observable even after one of the young had made its escape through it. The inside, when examined with the little finger, was found to be a round space, a little less than an inch round and rounded, but very confined; it contained only five young; but another less elaborately formed sheltered no less than nine. The panicles and leaves were slit into minute strips or strings by the teeth of the animal in order to assist the neatness of its weaving. Mr. Macgillivray found one of these nests in Fifeshire composed of dry blades of coarse grass, arranged in a globular form, and placed in the midst of a tuft of Arra anyn, nine inches from the ground; it contained six or seven young naked and blind. The food of this little mouse consists of corn and grass seeds, insects, and earth-worms: one to which a bit of the tail of a dead blind worm, anguis fragilis, was presented, devoured it greedily. Of insects it says: 'I have seen them eat a very great many.'

'One evening, as I was sitting at my writing-desk, and the animal was playing about in the open part of its cage, a large blue fly happened to buzz against the wires. The little creature, although at twice or thrice the distance of its own length from it, sprang along the wires with the greatest agility, and would certainly have seizing it, had the space between the wires been sufficiently wide to have admitted her teeth or paws to reach it. I was surprised at this occurrence, as I had been led to believe that the Harvest Mouse was merely a granivorous animal. I caught the fly and made it buzz in my fingers against the wires. The mouse, though usually shy and timid, immediately came out of her hiding-place, and running to the spot, seized and devoured it. For future times I might possibly be able to learn to deceive her; and I always preferred to do so to every other kind of food that I offered her.' — Mr. Macgillivray. Vol. XV. 3 T
gillivray figures one in the coils of an earth-worm, which it devoured, though the worm at first upset it by twisting round its body. (Naturalist's Library—Mammalia, vol. vii.; British Quadrupeds, pl. 27.)

Col. Montagu failed to keep it in confinement, but it has been so kept. The Rev. W. Bingley and Mr. Broderip observed that the tail is in a degree prehensile. The latter has a pair in a dormouse's cage for some time, and frequently saw them coil the end of their tails round the bars, especially when they were straggling along the sides or on the top of it. They became very familiar, soon recognised their friends, and would lie down or rear themselves up to be tickled with a straw or a pen; an operation which they evidently enjoyed much. We know of no instance when the female has brought forth in confinement where she has not eaten her young. One just born that was saved from the teeth of the mother is in the Museum of the Royal College of Surgeons, and is perhaps one of the smallest placental quadrupeds that ever breathed.

Geographical Distribution.—Europe, perhaps generally. It has been found in Siberia, Russia, and Germany. In Britain it is recorded as having occurred in Hampshire, Gloucestershire, Wiltshire, and Devonshire; in the three last counties by Col. Montagu, and noted as not uncommon. It has been found also in Cambridgeshire. Mr. Macgillivray had one sent to him from Abercornshire, and another from the neighbourhood of Edinburgh: he found, as we have seen, the nest in Fifeshire.

show that the animal must have been familiarly known to his audience; and it must have been very common early in the seventeenth century, when the white variety was probably well known; for in a 'Session Minutes' (May, 1626), that a suspected witch, Janet, came to John White's house, 'and span on his wife's wheel in her absence, and thereafter there came a white Rattoon at sundrie times and sat on his cow's back, that the said cow dwined away.' The report of the usureration of the hounds of this species by the Brown Rat. The Black Rat, he says, 'is now rarely found, either in old houses of large cities, as in London, in Edinburgh, and some other places, where it exists in considerable numbers, especially in the cellars and stables of the city of London, in many of which it is more common than the other.' Mr. Macgillivray remarks that in Edinburgh it appears to be completely exterminated. 'I have not heard it continue,' says a specimen obtained there two or fifteen years.' The last-mentioned author also tells us that the Rev. Mr. Gordon, minister of Birnie, some years ago sent him several individuals alive, which were caught at Elgin, where however the species is much less frequent; met with than the Brown Rat. With, he says, which is at a greater distance from the coast, it is not very common; and in other inland towns and villages in Scotland it is still to be procured. 'Whether,' adds Mr. Macgillivray, 'the destruction of this animal has been effected by the larger and more ferocious Brown Rat, or, like that of many tribes of the human species, has resulted from the diminution of food, caused by the overwhelming increase of an unfriendly race, it is impossible to determine.' The Black Rat is greyish black above and ash-coloured beneath; the ears are half the length of the head, and the tail is rather longer than the body. Mr. Bell gives the following dimensions:

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<th>In.</th>
<th>Lin.</th>
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<tbody>
<tr>
<td>Lengh of the head and body</td>
<td>7 11</td>
</tr>
<tr>
<td>Length of the head</td>
<td>7 8</td>
</tr>
<tr>
<td>Length of the ears</td>
<td>8 10</td>
</tr>
<tr>
<td>Length of the tail</td>
<td>7 11</td>
</tr>
</tbody>
</table>

It breeds often in the year, and the female ordinarily produces from seven to nine at a birth. Like the Brown species, it is omnivorous. Mr. Bell thinks it probable, from the proximity of the two countries, that it was introduced into this kingdom from France, and observes that the Welsh name for it, which signifies 'French Mouse,' appears to favour this opinion. From Europe, he adds, it has been sent with the Brown Rat to America, the islands of the Pacific, and to many other places.

Mr. Thompson (Zool. Proc., 1837) notices an Irish Rat with a white breast, which he is inclined to consider distinct from Mus rattus, and which he names Mus hyperborea.

Dr. Richardson did not observe the Black Rat in the Far Countries; and he says that he may venture to affirm that
it had not, when he wrote, advanced farther north than the plains of the Saskatchewan.

The Greyish-brown Surmulot of the French; Norw a y Rat of the English; Mus decumanus of Pallas and Gmelin; and Mus Norvegicus of Brisson.

Why this overwhelming pest has the name of Norway Rat does not appear: so far from its being abor- iginally the native of Norway, the story is that the name was first applied to it. 'It is,' says Pennant, 'an animal quite unknown in Scandinavia, as we have been assured by several natives of the countries which form that tract, and Linnaeus takes no notice of it in his last 'System.' It is fit here to remark an error of naturalists in speaking of the common Rat, which he says was first brought from America into Europe by means of a ship bound to Antwerp. The fact is that both Rat and Mouse were known to the World before the time of the Europeans, and the first Rats it ever knew were introduced there by a ship from Antwerp. This animal never made its appearance in England till about forty years ago. I am not aware that this Rat came in ships originally from the East Indies. They are found there, and also in vast numbers in Persia, from whence they have made their way westwardly even to Petersburg.' It made its appearance in the neighbourhood of Paris about 1730. Mr. Bell states that the first introduction of the Norway Rat to the city is La Souricière, its name having been changed to that of Casa di Casa of the Italians; Rat of the Spanish; Rattino of the Portuguese; Musa and Hausmannus of the Germans; Mus of the Dutch; Mus of the Swedes; Mus of the Danes; Mys of the ancient British; Mus musculus of the modern minor of Gerger; Mus domesticus vulgaris of the minor of Ray; and Mus Musculus of Linnaeus.

Dr. Richardson saw a dead mouse in a storehouse at York Factory filled with packages from England that the specimen may have been introduced into all the ports on the shores of Hudson's Bay; but he never heard of its being taken in the Fur Countries at a distance from the sea-coast. Mr. Say informed him that it was introduced at Engineer Cantonment on the Missouri, by Major Long's expedition.

Asiatic Rats and Mice.

It seems to be certain that the Brown Rat is an Asiatic species, and the Black Rat is not without claims to a similar geographical origin; but among the most formidable of the Oriental Rats is the Mus Giganteus of Hardwicke, Mus Max baricus of Shaw. Of this rat General Hardwicke gives a faithful figure, of the size of life, in the seventh volume of the Transactions of the Linnean Society: it has the appearance of a large brown Rat differing from the domestic Rat and very like a large house Mice in colour, having large ears, and looking very much like a large house mouse. It is about seven inches long, and weighs two pounds eleven ounces and a half. Its total length was 264 inches, of which the tail measured 13 inches. The male grows larger, and weighs three pounds and upwards. 'This rat,' writes the late lamented General, 'is found in many places on the coast of Comorandia, in Mysore, and in several parts of Bengal between Calcutta and Hardwar. It is partial to dry situations, and hardly ever found distant from habitations. The lowest caste of Hindus eat the flesh of this rat, in preference to that of any other species. It is a most mischievous animal, burrows to a great depth, and will pass under the foundations of granaries and storehouses, if not deeply laid. Mud, or unburnt brick walls, prove no security against its attacks, and it commonly perforates such buildings in all accessible places. It gnaws the bottoms of several holes are made for the entrance and exit of these vermin. Into this place Dusaussois, the proprietor, put the dead bodies of two or three horses; and having stopped up all the holes towards midnight, with as little noise as possible, he, with several workmen, each bearing a torch in one hand and a stick in the other, suddenly entered the enclosure, shut the door, and began a general massacre. Wherever a blow was directed, event, and those which attempted to escape by running up the walls were quickly knocked down. The dead of one night amounted to 2659; the result of four nights was 9191; and by repeating the experiment at intervals of a few days, Dusaussois destroyed 16,050 rats in the space of a month. Now when it is collected that the yard in which these numbers were killed does not contain more than a twentieth of the area over which the dead bodies were found, it is evident that the refuse and eminences are riddled with their burrows, and their paths thither to be traced from the enclosures were the horses and cattle...

This rat is greyish-brown above and greyish-white beneath, its head and body. Mr. Bell gives the following dimensions, from which its superiority in size to the Black Rat will be evident:---

<table>
<thead>
<tr>
<th>Character</th>
<th>Inches</th>
<th>Lines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head and body</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Head</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Tail</td>
<td>8</td>
<td>2</td>
</tr>
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White or yellowish-white varieties, being albinos with red eyes, and variegated individuals, sometimes occur.

The Common or Domestic Mouse needs no description. It seems to be entirely prevalent on civilized man, and has never been found at a distance from his dwelling. White varieties with pink eyes are kept and propagated as pets by those who admire such albinos: they are pretty little animals, and soon become familiar. This well-known species is Mus musculus of the French; Mus Musculus of the Italian; Mus of the Spanish; Rattino of the Portuguese; Mause and Hausmannus of the Germans; Mys of the Dutch; Mus of the Swedes; Muses of the Danes; Myos of the ancient British; Mus musculus minor of Gerger; Mus domesticus vulgaris minor. M. Ray; and Mus Musculus of Linnaeus.

Dr. Richardson found a dead mouse in a storehouse at York Factory filled with packages from England, and he probably that the specimen may have been introduced into all the ports on the shores of Hudson's Bay; but he never heard of its being taken in the Fur Countries at a distance from the sea-coast. Mr. Say informed him that it was introduced at Engineer Cantonment on the Missouri, by Major Long's expedition.

N. B. Linnaeus only mentions this on the authority of another. His words are: 'The Anomala' Anoteroprae primus in European perverias rathet Poppius, orb. Histor. 1858.
the Doctor says, that the robustness of its form and the remarkable size and strength of its front teeth agree with this character; its nose, he adds, is evidently employed in burrowing the ground in search of its food, and its tail has the character of those species which are in the habit of frequenting the water. Mr. Hodgson states that *Mus decumanus* and *Mus Rattus* are both very numerous and troublesome in Nepal; that *Mus Musculus* is very uncommon, and that *Field Mice* are frequently met with.

**African Rats and Mice.**

*A. Barbacinus*, the Barbaric Mouse, will serve as an example of the African species.

**Description.**—Darkish brown with five or six yellowish longitudinal stripes on each side, about half as wide as the intervening spaces, and becoming confounded towards the under parts, which are nearly white. Mr. Bennett observes, that on the fore-feet only three of the toes are at first visible; and that this circumstance, mentioned in the specific character given by Linnaeus, has led many subsequent naturalists to doubt whether the Barbaric Mouse really belonged to the genus with which it was associated. Linnaeus himself, continues Mr. Bennett, had however stated, in his description of the species, that rudiments of a thumb, and also of a fifth toe, were observable on a closer inspection; and this statement, he adds, was fully confirmed by the examination of the specimens in the Menagerie of the Zoological Society of London, which were intermediate in size between the Common Rat and Common Mouse.

**Locality.** Barbary, where they are not rare, and where the name given to them by the natives is *Phār-Asīf*, the Palmetto Mouse.

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**American Rats and Mice.**

Some of the best examples of the forms of American Mice will be found in the 'Zoology of H. M. S. Beagle,' where many species are figured: they were collected by Charles Darwin, Esq., at various parts of the southern coast of South America, viz. Coquimbo, Valparaiso, Port Desire, Maldonado, Bahia Blanca, &c. Mr. Waterhouse first described these in the Proceedings of the Zoological Society of London (1837), dividing them into several subordinate groups, to which he assigns the subgeneric titles of *Scaptomys*, *Acromys*, *Galemys*, *Calomys*, and *Phyllostis*, which last, in Mr. Waterhouse's opinion, indicates an aberrant form of the Muridae.

We select as an example *Mus (Phyllostis) Darwini*. Some of the best examples of the forms of American Mice will be found in the 'Zoology of H. M. S. Beagle,' where many species are figured: they were collected by Charles Darwin, Esq., at various parts of the southern coast of South America, viz. Coquimbo, Valparaiso, Port Desire, Maldonado, Bahia Blanca, &c. Mr. Waterhouse first described these in the Proceedings of the Zoological Society of London (1837), dividing them into several subordinate groups, to which he assigns the subgeneric titles of *Scaptomys*, *Acromys*, *Galemys*, *Calomys*, and *Phyllostis*, which last, in Mr. Waterhouse's opinion, indicates an aberrant form of the Muridae.

We select as an example *Mus (Phyllostis) Darwini*.

**Description.**—Fur above, cinnamon and blackish intermixed; in front of the eyes, saff-colour; cheeks, sides, and tail, near the base, yellow cinnamon; under parts and feet white; ears very large and leaf-like, nearly naked; the tail, which is nearly equal to the head and body, blackish brown above, white beneath. Length from the tip of the nose to the end of the tail 10 inches, 9 lines, of which the tail measures 4 inches, 9 lines.

**Locality.** Coquimbo.

Mr. Waterhouse also characterises from the same collection two new genera of small Rodents, *Reithrodont and Abrocoma*. The affinity of the first is stated to be with the *Muridae*, and the second Mr. Waterhouse considers to be evidently allied on the one hand to *Octodon*, *Chromomys*, and *Pnothamys*, and on the other to the *Chinchillid*. See further, post, 418.

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**Capromys.** (Desmarest; *Ictidomys*, Say.)

**Generic Character.**—Fore-feet four-toed; thumb rudimentary. Hind-feet strong, thick, five-toed. Tail moderate, thick at the base, scaled, with few hairs. Molars prismatic, with their crowns traversed by folds of enamel, which penetrate rather deeply, and resemble those in the crowns of the teeth of the Beavers.

**Dental Formula.**

\[
\text{Incisors} : 2 \quad 2 \quad 2 \quad 1 \\
\text{Molars} : 4 \quad 4 \quad 3 = 20.
\]

**Example.** *Capromys Furnieri*, Desm.; *Ictidomys phaeodon*, Say.

**Description.**—Size of a rather small rabbit. For crown, greenish or blackish brown, tinged with specks of obscurum yellow above, except on the rump, where the hairs are stiff.
and which is reddish-brown; belly and chest dirty brownish-grey; muzzle and feet blackish.

**Habits.** — M. Desmarest was presented with two males from Cuba by M. Fournier. Of the habits of these animals in the wild state, the latter knows only that they are found in woods, that they climb trees with great facility, and that they live on vegetables. In the domesticated state, M. Desmarest remarked that their intelligence appeared to be developed as much as that of rats and squirrels, being much beyond that of rabbits and Guinea pigs. They showed great curiosity, and were very wakeful at night, but their sense of hearing did not seem so fine as that of rabbits and hares. Their nostrils were incessantly in motion, especially when they smelt any new object, and their taste was sufficiently delicate to detect whether any vegetable which had been touched by animal substances, which last appeared to be odious to them. They agreed well, sleeping close together, and, when they were apart, they called to each other with a sharp cry differing little from that of a rat: they expressed pleasure by a low soft kind of gruntning.

They hardly ever quarrelled, except for food, as when one piece of fruit only was given between both; one would then seize it and run away till the other was able to take it from him. They sometimes played for a long time together, holding themselves up in the manner of kangaroos, firmly supported upon the broad soles of their feet and the base of the tail, and striking each other with the hands, until one of them finding a wall or some other body against which to support himself, acquired additional power and gained advantage, but they never bit each other. They manifested the greatest indifference to other animals, paying no attention even to cats. They were fond of being caressed, and particularly of being scratched under the chin. They did not bite, but slightly pressed with the incisive teeth the skin of those who caressed them. They did not ordinarily drink, but M. Desmarest saw them occasionally suck up water as squirrels do. Their food was solely vegetable, such as cabbage, succory, grapes, nuts, bread, apples, &c. &c.; and they were not very difficult in their choice of it, though they were very fond of highly flavoured herbs and aromatic plants,—wormwood, rosemary, piperment, geranium, celerly, &c., for instance. Grapes too pleased them mightily, and to obtain the fruit they climbed up a long pole on which it was placed: they were fond of bread steeped in asaiced or wine. Their excrements were long black lumps similar in consistence to that of rabbits. Their urine reddened, in drying, white linen wetted with it.

Crepomya furnieri.

They were almost absolutely plantigrade, and their movements were slow, the hinder parts appearing to be embarrassed, as it were, when they walked, as may be observed in the bear. They took occasional leaps, suddenly turning round from head to tail, like the field mouse, and galloped, when at play, making a considerable noise with the soles of the feet. They could make them to distinguish and reject vegetables, with their tails as a support and using the same in descend- ing. In certain positions, on a stick for example, the tail served as a balance to preserve equilibrium. They often raised themselves to a listening posture, sitting erect, with the hands hanging down, like rabbits and hares; and, in eating, they employed, sometimes both, at other times one of their hands only. The latter happens when the substance they are holding is small enough to be held between the fingers and the tubercle at the base of the thumb.

This species bears an evident resemblance to some other of the genus of **Utsia**, and M. Desmarest thinks that it is the animal described by Bomare, Orivio, and others, more than 300 years since. According to Bomare, the **Utsia** is a species of rabbit of the size of a rat, which inhabits the West Indies, and is hunted at night by the light of a luminous insect, named **Acadia** (probably *Elater noctunculus*), of which M. Fournier brought large quantities from Cuba.

Another species, also from Cuba, *Crepomya prehensilis* (*Kippis*), is also recorded, but Dr. Fischer places the mark of doubt before it.

For Mr. Owen's observations on the comparative anatomy of *Crepomya* see the Zool. Proc. for 1832 and 1833.

**Cricetus [Hamstcr]**. And see further, p. 518.

**Jumping Mice.**

The race of Jerboas, or Dipodidae, appears to be ordained by nature for living upon desert and sandy plains.

Schreber, and he was followed by Gmelin and others, appears to have been the first who characterised the genus *Dipus*.

Mr. Gray (Annals of Philosophy, 1822) makes the Jerboad the fourth family of the *Greas*, and thus characterises it: cutting-teeth two in each jaw; grinders simple or double; pointed or rounded; ears moderate; eyes large, prominent; claws distinct; fore feet short (used as hands); hind feet very long; tail long, hairy, used in leaping or walking; fur soft. And he thus divides the family—

Grinders compound or rootless.


Grinders simple, roots divided; legs nearly equal.


Mr. Swainson (Classification of Quadrupeds) observes that the Jerboas (*Dipus*) are remarkable for possessing the longest hind legs of any quadrupeds yet discovered, while the fore legs are disproportionately short; this structure he remarks is seen also in the Kangaroos, which seem to be represented in miniature by these little animals, which, like their pouched relatives, have no teeth except as organs of rast upon the ground; for if they are frightened or wish to proceed at a quick pace, they stand upon the hind legs only, and take prodigious leaps. That the tail is necessary for the efficient performance of these feats, is proved by the fact that individuals deprived of their tails were unable to assume the erect position or to leap at all. The fore feet are employed in conveying food to the mouth, and seem to be of little or no use as organs of progression. Those that we have seen alive seemed to use their posterior extremities only as organs of locomotion, and appeared to walk on the toes of those extremities. They are very bird-like in some of their movements, and there is something in their general appearance that would lead an imaginative mind to the fancy that they were birds suddenly transformed to quadrupeds and were hardly reconciled to the change. Parts of their internal structure, in the skeleton particularly, are bird-like.

Mr. Swainson says, The best-known species is the Gerbo, or Egyptian Jerboa (*Dipus Sagitta*), in which country it is very common. It lives in large societies and constructs burrows under ground: it is shy and timid, nor can it be kept in confinement any considerable time. Of four typical species already described, three inhabit the central deserts in the heart of Asia, and the shores of the Caspian: the other has been separated as a subgenus, under the name of Ger- til (Gerbillus); but their distinctions are so very slight that we have not adopted the name. The genus *Pedetes*, represented by the largest and most highly specialized group, America, which has no Jerboa, nevertheless presents us with their prototypes in the Jumping Mice of Canada (*Meriones, Illig.*).

The Jerboas have, in truth, presented considerable diffi-
ularity to zoologists, and the distinction of the species is often not clearly made out. Sommuni was one of the first who endeavoured to dissipate the confusion which prevailed on the subject. He comes to the conclusion that there exists but one variety of them in Egypt, where they are multiplied without end. 'In fact,' says M. Sommuni, 'among all the different species I observed, I have not observed any differences, and so I never remarked the least dissimilitude of either form or colour.' His paper, M. Berthout van Berchem's letter on the true nomenclature of the Gerboise, and M. Sommuni's reply to the same, will be found in the Travels of the latter in Upper and Lower Egypt. That these Jerboas were known to the antients is evident. Herodotus (iv. 192) alludes to them as inhabiting Africa. Aristotle (Hist. Anim., vi. 37) speaks of them as Egyptian Rats which walk on two feet, because the hind feet are great and the fore feet small. They are noticed by Aelian (xv. 26), who quotes Theophrastus. The description of Theophrastus (Fr. xiv.) cannot be mistaken. He says that these rats have indeed fore feet, but do not walk upon them and use them as hands. When they flee, he adds, they leap. They are clearly the Egyptian mice of Pliny, who says 'bipedes ambulant' (x. 65), and Pennant gives an engraving of a gold coin with the plant Silphium and one of these animals represented on it, and says that these symbols were used to denote the country of Cyrene, where both were found.

One of the best monographs of the genus Dipus is that of M. Lichtenstein: the species he gives are numerous, and it may be doubted whether some of them are not varieties. The very elaborate memoir on the Jerboas and Gerbillas, by M. F. Cuvier, was read before the Zoological Society of London in 1836, and is published, with beautiful illustrations, in the Transactions of that Society (vol. ii.).

M. F. Cuvier commences this memoir with observing that his attention had been particularly directed to the Rodentia, with a view of arriving at a natural classification of the numerous species composing that order, among which considerable confusion had hitherto prevailed, particularly in the genera Dipus and Gerbillus, the relations of which to other allied groups had been but very imperfectly understood by previous writers. The species included in the genus Dipus had been formed by M. Lichtenstein into three divisions, which are distinguished by the absence and number of rudimentary toes upon the hind feet. In the first section are placed those with three toes, all perfectly formed; in the second, those with four, one of which is rudimentary; and in the third, those with five, two of these being rudimentary. M. Cuvier states that he is unacquainted with the second division of M. Lichtenstein; but in the examination of the species belonging to the first, in addition to the absence of rudimentary toes, he finds that they are also distinguished from those of the third by the form of the teeth and the osteological characters of the head. These points of difference he considers of sufficient importance to justify a distinct genus for the Jerboas with five toes, adopting the name Allocata, given by Pallas to a species, as the common generic appellation. M. Cuvier remarks that the three principal toes of the Allocataia, as well as the three only toes of the Jerboas, are articulated to a single metatarsal bone, and that the two rudimentary toes of the first genus have each a metatarsal bone; whereas it results that the penultimate segment of the foot is composed of three bones in the Allocataia, and of one only in the Jerboas. The incisors of the Allocataia are simple, whilst those in the upper jaw of the Jerboas are divided longitudinally by a furrow. The molars of the latter genus are complicated in form, and but little resemble those of the former. They are four in number in the upper jaw, and three in the lower; but the first in the upper is a small rudimentary tooth, which probably disappears in aged individuals. After a detailed account of the structure of the grinding teeth, M. Cuvier observes that the general structure of the head of the Allocataia and Jerboas is evidently the same, and is characterised by the size of the cranium, the shortness of the muzzle, and, above all, by the magnitude of the suborbital foramina. The cranium of the Jerboas is distinguished by its great breadth posteriorly, resulting from the enormous development of the tympanic bone, which extends beyond the occipital posteriorly and laterally, as far as the zygomatic arch, which is by no means the case in the Allocataia, where all the ossaeous parts of the ear are of moderate dimensions. Another differential cha-

For the detailed descriptions of these, we must refer the reader to the 'Transactions of the Zoological Society,' in which will also be found M. F. Cuvier's views with regard to the affinities of the Gerbillas and Alactagas to the Jerboas, and which lead him to the conclusion that the Gerbillas have a much nearer affinity to the Murids.

Cranium and teeth of Gerbillus Burtoni.

a. skull, profile; b, same, seen from above; c, same, seen from below; d, teeth of same.

Egyptian Jerboa (Dipus Aegyptiacus, Hemp. and Rhen.)

destructive to wheat and barley crops, of which they lay up considerable hoards in spacious burrows near the scenes of their plunder. They cut the culms of the ripening corn just beneath the ears, and convey them thus entire to one common subterranean repository, which, when filled, they carefully close, and do not open for use till supplies abroad become distant and scarce. Grain of all kinds is their favourite food; but, in default of this, they have recourse to the roots of grass and other vegetables. A bout the close of day they issue from their burrows, and traverse the plains in all directions to a considerable distance; they run fast, but oftener leap, making bounds of four or five yards at a time, carrying the tail extended in a horizontal direction. When eating, they sit on their hind legs like a squirrel, holding the food between their fore feet. They never appear by day, neither do they commit depredations within doors. I have observed their manners by night, in moonlight nights, taking my station on a plain, and remaining for some time with as little motion as possible. I was soon surrounded by hundreds at the distance of a few yards; but on rising from my seat, the whole disappeared in an instant, nor did they venture forth again for ten minutes after, and then with much caution and circumspection.

‘A tribe of low Hindus, called Kunjers, whose occupation is hunting, go in quest of these animals at proper seasons, to plunder their hoards of grain; and often, within the space of twenty yards square, find as much corn in the ear as could be crammed into a common bushel. They inhabit dry situations, and are often found at the distance of some miles out of the reach of water to drink. In confinement this animal soon becomes reconciled to its situation, and doles; sleeps much in the day, but when awake feeds as freely as by night. The Hindus above mentioned esteem them good and nutritious food.’ (Linn. Trans., vol. viii.)

In concluding this sketch, which we hope will be found to contain the leading information on the subject of the Jerboas, we must not omit to mention Mr. Ogilby's notice of the discovery of a true Jerboa on the central downs of
Australia, by Sir Thomas Mitchell, an event, as Mr. Ogilby justly says, of no small interest to the scientific zoologist who occupies himself with the important question of the geographical distribution of animals. The arid deserts of Asia and Africa, the solitary steppes of Southern Siberia, and the boundless prairies of America, have been long known to be inhabited by numerous species belonging to this or the closely allied genus of Gerbillus; in short, wherever extensive and open plains were found to exist, whether in the Old World or in the New, there likewise were found these little two-legged rats, hopping along or running with great velocity upon their hind legs, and appearing as if nature had expressly intended them to occupy such a situation. Australia alone was believed to form an exception to the general rule in this instance, as in so many others. Who will undertake to say that the progress of discovery may not destroy its anomalous character in many other instances, as it has done in this? (Linn. Trans. vol. xviii.) Mr. Ogilby then proceeds to name this species Dipus Mitchellii, after its meritorious discoverer, and gives a detailed description of the species, for which we refer to the vol. of the 'Lineae Transactions' last above quoted. The animal was found on the reedy plains near the junction of the Murray and the Murrumbidgee, on the northern boundaries of Australia Felix. The cut is taken from the figure in Sir T. Mitchell's account of 'Three Expeditions into the Interior of Eastern Australia.' Sir T. Mitchell states that its fore and hind legs resembled in proportion those of the Kangaroo; and it used the latter by leaping on its hind quarters in the same manner. It was not much larger than a common field-mouse, but the tail was longer in proportion even than that of a Kangaroo, and terminated in a hairy brush about two inches long.

![Dipus Mitchellii.](image)

Here we may perhaps notice that Mr. Ogilby, in the same paper as that wherein he describes D. Mitchellii, characterizes another new genus of Australian Rodents, which he thinks most probably belongs to the extensive and complicated family of the Muridae. In some of the characters the genus very much resembles the Campagnola (Arreocola) and Gerbillides (Meriones), to the latter of which genera Mr. Ogilby says that Comlitus is more particularly related by the length and development of the posterior members.

**Meriones. (Ill., F. Cav.)**

**Generic Character.**—Differing from the other Rats with long feet in the form of its molars, which are composite.

**Dental Formula:** — Incisors $\frac{1}{2}$; molars $\frac{3}{4}$ = 18.

**Example.** MerionesLaboratorium; Labrador Jumping Mouse.

**Description.**—Back and upper parts of the head dark liver-brown mixed with brownish-yellow; sides brownish-yellow slightly sprinkled with black; margin of the mouth, chin, throat, and all the lower parts of the body white; yellowish-brown of the sides joining the white of the belly by a straight line passing between the fore and hind extremities. Fur not so long or so fine as that of the common meadow mice. Total length nine inches nine lines, of which the tail measures five inches three lines; this last tapers slightly, is scaly, and thinly set with short hairs.

Dr. Richardson, from whose **Furra Borealis Americana** the above description is abridged, states that in some specimens the yellowish-brown colour occupies as much space as the darker colour of the back; in others the latter encroaches so much on the sides as to leave merely a narrow yellowish line next the white; whilst in autumn specimens, where the animal has just acquired a new coat of fur, the dark colour of the back adjoins the white of the belly.

This appears to be the **Labrador Rat of Pennant; Gerbillus Hudsoni of Rafinesque-Smalts; Mus Labradororum of Sabine; Gerbillus Labradori of Harlan; Labrador Jumping Mouse of Godman; and Kate (the leaper) of the Chepeyan Indians.**

Dr. Richardson remarks that Pennant, in his *Arctic Zoology,* first described a specimen of this animal, sent from Hudson's Bay by Mr. Graham, to the museum of the Royal Society. Afterwards, in the third edition of his *History of Quadrupeds,* he is inclined to consider it as identical with the *Dipus longigenus* of Pallas (the *Dipus cornutus* of Gmelin), an inhabitant of the warm sandy deserts bordering on the Caspian Sea. This opinion, which, in the opinion of the Doctor, can scarcely be correct, was confirmed by an individual from Hudson's Bay specimen whilst it was suspended in spirits, and is opposed by differences in colour and other characters which he himself points out. From Pennant's time until Mr. Sabine described an individual brought from Cumberland House, on Captain Franklin's first journey, the *Labrador Jumping Mouse* does not, continues Dr. Richardson, appear to have attracted the notice of naturalists. Pennant, he observes, mentions a yellow lateral line in his specimen, which did not exist in the one Mr. Sabine described, but this difference Dr. Richardson attributes solely to the season in which they were procured. Mr. Sabine's specimen, he remarks, was mutilated in the tail, an accident very common to the whole family of rats; and Pennant, under the name of Canada Jerked Rat, and Colonel Daries, under that of *Dipus Canadensis,* describes another Jumping Mouse, which seems to differ from this in having ears shorter than the fur, but in other respects to be very similar to it.

After further observing that the *Gerbillus Canadensis* of Godman agrees in description with Rafinesque-Smalts's *Gerbillus soricinus* (Deerms.), but has larger ears than the Canada Rat of Pennant, and that a specimen in the Philosophical museum, described by Mr. Harlan, under the name of *Gerbillus Canadensis,* appears to be entirely similar to the Labrador species, Dr. Richardson concludes...
by remarking that it is evident that the Jumping Mice inhabiting different districts of America require to be compared with each other before the true number of species and their geographical distribution can be ascertained.

Locality.—Common in the Fur Countries as far north as Great Slave Lake, and perhaps farther; but Dr. Richardson was not able to gain any precise information respecting its habits.

Pedetes (III.; Helamys, F. Cuv.)

Generic Character.—Head large, flatish, muzzle thick, ears long. Anterior extremities with five toes armed with very long claws; posterior extremities very long, four-toed. Tail long and very bushy. Pou: pectoral mammae. Molars simple, with two laminæ.

Dental Formula:—Incisors 2; canines 2; molars 4–4 = 20.

Example, Pedetes Capensis.

Description.—Bright yellowish-tawny above, varied with blackish; white below, with a line of the same colour in the fold of the groins; legs brown, tail reddish above at its origin, grey below, and black at the tip. Length from nose to tail about one foot two inches; of the tail, near fifteen; of the ears, three.

Pedetes Capensis.

P. C. No 976.
passed into the hands of M. Temminck) is, in fact, similar to the gauffres, in having cheek-pouches that open externally, and that consequently Major Davis's drawing represented them in an unnatural and inverted position. Mr. Say gives the characters of a Missouri gaufrer, with cheek-pouches opening externally; and he identifies his specimen with Mus boraxius. The same zoologist alludes to the Georgia hamster as belonging to the same genus, without giving any further account of its characters than merely quoting Dr. Barton's remark of its being only half the size of the Missouri one. His account of the dentition of the Missouri gaufrer, observes Dr. Richardson in conclusion, corresponds, as far as it goes, pretty closely with that of the Columbia Geomys. Dr. Harlan and Dr. Godman refer the Georgia, Canada, and Missouri animals to one species. (*Prarie Boraxii Americana.*)

The following is the dental formula of Geomys given by Dr. Richardson:

- **Incisors,** $\frac{2}{2}$
- **Canines,** $0-0$
- **Grinders,** $\frac{4-4}{4-4} = 20$,

and below is given the skull and teeth of the genus from the same authority.

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The dental formula of M. P. Cuvier's genus *Saccomyys* is:

- **Incisors,** $\frac{2}{2}$
- **Molars,** $\frac{4-4}{4-4} = 20$, and the following cut

is taken from his figure of the dentition.

The following is Dr. Shaw's description of *Mus boraxii*:

'**Ash-coloured rat, with short nearly naked tail, pouch'd cheeks, and the claws of the fore-feet very large and formed for burrowing.'**

(*Mus boraxius, Linn. Trans., vol. v., p. 527, pl. 8.*)

'This, which is a species but lately discovered, seems to be the most remarkable of all the pouch'd rats for the proportional size of the receptacles. It is a native of Canada, and the individual here figured was taken by some Indians in the year 1798, and afterwards presented to the lady of Governor Prescott. It is about the size of a brown or Norway rat, and is of a pale greyish-brown colour, rather lighter beneath: the length to the tail is about nine inches, and that of the tail, which is but slightly covered with hairs, about two inches: the legs are short; the fore-feet strong, and well adapted for burrowing in the ground, having five claws, of which the three middle ones are very large and long; the interior much smaller, and the exterior very small, with a large tubercle or bow beneath it. The claws on the hind-feet are comparatively very small, but the two middle are larger than the rest, and the inferior or a scarce visible: the teeth are extremely strong, particularly the lower pair, which are much longer than the upper. The ears are very small. This species is described in the 23 vol. of the *Trans. of Linn. Soc.*, but I must observe, that by some oversight in the conduct of the figure there given, the claws on the fore-feet are represented as only three in number, and are somewhat too long, weak, and curved: the engraving in the present plate is a more faithful representation, and is accompanied by an outline of the head in its natural size, as viewed in front, in order to show the teeth and cheek-pouches. The manners of this species are at present unknown, but it may be concluded that it lays in a stock of provisions, either for autumnal or winter food. The pouches of the individual specimen above described, were first brought to Governor Prescott, were filled with a kind of earthy substance: it is therefore not improbable that the Indians who caught the animal might have stuffed them thus, in order to preserve them in their utmost extent.'

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In *Dr. Richardson's Geomys Douglasii*, the length of the head and body was 8 inches 8 lines, and that of the tail (vertebrae) 2 inches 10 lines. Cheek-pouches large, much resembling the thumb of a lady's glove in form as
size, and hanging down by the sides of the head. The specimen was a female, and was taken in her nest with three young ones, near the mouth of the Columbia, by Mr. Douglas. When it came into the hands of Dr. Richardson, the fur had mostly fallen off, but the specimen was in other respects perfect, and what was wanting to the description was supplied from Douglas’s notes. The state of osification of the skull showed the animal to be an old one. Douglas informed Dr. Richardson that the outside of the pouches was cold to the touch, even when the animal was alive, and that on the inside they were lined with small, orbicular, indurated glands, more numerous near the opening into the mouth. When full, the pouches had an oblong form, and when empty, they were corrugated or retracted to one-third of their length; but, it is added, they are never inverted so as to produce the hood-like form of the pouch of Diplostoma. When in the act of emptying its pouches, the animal sits on its hams like a Marmot or squirrel, and squeezes his sacks against the breast with his chin and forepaws. (Fauna Boreali-Americana.)

Habits. — Dr. Richardson states that these little sand-rats are numerous in the neighbourhood of Fort Vancouver, where they inhabit the declivities of low hills, and burrow in the sandy soil. They feed on acorns, nuts (corylus roe- trata), and grass and great bunches of the potato-fields adjoining the Fort, not only by devouring the potato on the spot, but by carrying off large quantities of them in their pouches.

The following figure is copied from Dr. Richardson’s Diplostoma bullivorum.

Not Pouched.

Aplodontia. (Richardson.)

Generic Character. — Head large, depressed; ears short and round; no cheek pouches. Feet five-toed, with long, strong, and compressed claws. Tail very small and concealed by the fur. First molar in upper jaw small, cylindrical, and pointed, placed within the anterior corner of the second one, and existing in the adult.

Dental Formula: — Incisors, 2-2 2; molars, 4-4 4 = 22.

Example, Aplodontia leporina.

Description. — Head large; nose thick and obtuse, covered with a dense coat of short fur; eye very small; ear resembling the human in form. Body short, thick, and rabbit-like. Legs very short, and covered down to the wrists and heels with fur similar to that on the body: a little above the wrist joint, on the inner side, is a small tuft of stiff white hair. Fur like that of a rabbit out of season, amber and chestnut-brown above; grayish or clow-brown beneath; lips whitish; a rather large spot of pure white on the throat; some white hairs dispersed through the fur. Tail slender, cylindrical, half an inch long.

Dr. Richardson gives the following as the synonyms of this animal: — Secellel, Lewis and Clark; Anisotoma ryafa, Rafinesque-Smalts, Desm.; Arctoma ryafa, Harlan; Marmos, No. 17, Hudson’s Bay Museum; and he says that amongst Mr. Douglas’s specimens there was a young one, with more white hairs interspersed through its fur, and some differences in the form of its skull, which seem to point it out as a second species, but the specimen was not sufficiently perfect to enable Dr. Richardson to give its characters as a distinct species, though he has little doubt of its being so. The Doctor adds, that since the account of the genus was published in the “Zoological Journal” (vol. iv.), Mr. Douglas had placed in his hands an Indian blanket or robe formed by sewing the skins of the Secellel together. The robe contained twenty-seven skins, which had been selected when the fur was in prime order. In all of them the long hairs were cut short and tied as to hide the coat or down at their roots, and their points had a very high lustre. The general colour of the surface of the fur was between chestnut andumber-brown, lighter, and with more lustre on the sides. Some of the skins, which were in the best order, had the long hairs on the back of the head and between the shoulders almost black. Dr. Richardson observes further, that it is probable that there were the skins of two species of Secellel in the robe, and that one of them wants the white mark on the throat. The down of all the skins of the robe had a shining blackish grey colour.

Habits. — These animals live in small societies, in burrows, and feed on vegetable substances.

Locality. — Neighbourhood of the Columbia river, most abundant near the small falls and rapids.

Mr. Gray makes the Arapaceidae the fifth family of the Girra, with the following character:—

Cutting teeth two in each jaw, lower chisel or awl shaped, often very much exposed; grinders compound or simple, rarely rootless; ears and eyes often very small, sometimes hid; clavicles strong; limbs proportionate; tail none, or hairy, cylindrical; fur very soft. He thus subdivides it into five subfamilies.


Dr. Fischer thinks that Creutzchman’s genus Pasmommus should be placed before Aspalax. (See Ruppel, Zool. All.) Pasmommus obesus, on which the genus is founded, gives gregariously in the sandy deserts of Alexandria, forming multiform burrows, and is a nocturnal and root-eating animal, without cheek-pouches.

Aspalax (Oliv. and others; Spalaz, Güld., Ill, and others.)

Dental Formula: - Incisors \( \frac{2}{2} \); molars \( \frac{3-3}{3-3} = 16 \).

Example, *Aspalax typhlus*.

Description.-Head broader than the body, no aperture for the rudimentary eyes, which, no bigger than poppy-seeds, are hid beneath the skin; no external ears; end of the nose covered with a thick skin, nostrils very remote, and placed below; limbs very short, toes separated, except a thin membrane at the base, claws short; hair or fur short, thick, and very soft, dusky at the bottom and cinereous grey at the tip, space about the nose and above the mouth white. Length between 7 and 8 inches.

This is supposed by some to be the *derallat* of Aristotle (Hist. Anim., i. 9, and iv. 8). It is evident, from both the passages quoted, that he had accurately examined that part of the animal where the eye should be, and the result of his examination clearly agrees with the condition of those parts in the *Aspalax* of the moderns; but it must not be forgotten that those and other passages will equally apply to a second species of Mole (*Talpa*), now named *Talpa caecu*, which inhabits Europe, and in which the eyelids are closed, whilst in the common species they are open. It appears to be the *Spalax typhlus* of Illiger; *Aspalax typhlus* of Desmarest; *Mus typhalus* of Pallas and others; *Marmota typhulus* of Blumenbach; *Georicyctes typhalus* of Lesson; the *Zenmi* of Raczynski; the *Siepez* of Gimelin; the *Podillus Marmot* of Pennant; and the Blind Rat of Shaw.

Habits, &c.-This species, which the Russians name *Siepez*, or the blind, and the Cosacks *Slochor Nomon*, signifying the same defect, burrows extensively beneath the turf, driving at intervals lateral passages in its search for roots, particularly that of the bulbous *Cherophyllum*. Openings to the surface occur at distances of some yards from each other, and there the earth is raised into hillocks, sometimes of two yards in circumference, and of considerable height. It works stoutly and rapidly, and on the approach of an enemy instantly digs a perpendicular burrow. Though it cannot see, it lifts its head in a menacing attitude towards its assailant, and, when irritated, snorts and gnashes its teeth, but emits no cry: its bite is very severe. In the morning it often quits its hole, and during the season of love basks in the sun with the female. It is worthy of notice that there runs a superstition in the Ukraine that the hand which has succumbed one of these animals is gifted with the virtue of curing the king's evil (as it is still called), in the same way that it was supposed to vanish before the royal touch of the Stuarts in this country.

Locality.-The southern parts of Russia, from Poland to the Volga, but not to the east of that river; common from the Syrzan to the Sarpa; frequent along the Don, even to its origin, and about the town of Ross, but not in the sandy parts.

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Teeth of *Orycterus*. (F. Cuvier.)

Dr. Fischer quotes Professor Kaup for the opinion that the *Bathyergus Capensis* of Brants (Cape Rat of Shaw and Pennant) and *Bathyergus maritimus* of Brants (Coast Rat of Shaw, *Orycterus maritimus* of F. Cuvier) are identical, the former being the animal in a comparatively early stage of life. The latter is the *Zand Moll* of the Dutch and *Krau-bokla* of the Hottentots: it is of a reddish grey or ash-colour above, and hoary beneath. Length from tip of muzzle to origin of tail, 1 foot 15 inches; of tail without the hair, 1 inch 1 line; of the pencil of hairs, 10 lines. There is a variety all white.

Locality and Habitat.-The sand-flats of the Cape of Good Hope, where it burrows in great numbers. In every part of those flats Mr. Burchell observed innumerable mole-hills, and his foot often sunk into their galleries: for this reason, he remarks, it is very unpleasant, if not dangerous, to ride on horseback in such places, as persons are liable to be thrown by the feet of their horses unexpectedly sinking into these holes.

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Coast Rat.

The following genera are placed by Mr. Swainson among the Squirrels, and, indeed, there is much about them to indicate a near approach to that family of Rodents.

Not Pouched.

*Arctomys.* (Gmelin.)

Generic Character.-Head and eyes large; ears short; body stout; fore feet with four toes and an obsolete thumb, hind feet five-toed. Tail short. Upper surface of molars ridged and tuberculous.

Dental Formula: - Incisors \( \frac{2}{2} \); molars \( \frac{3-3}{3-3} = 22 \).

Examples, *Arctomys Murina*, Schreb., and *Arctomys Eptera*, Schreb.: the latter as an example of the American Marmots.

*Arctomys Murina.* - This is the *Mus Alymus* of Gezer and others; *Mus Murina* of Linnaeus and others; *Gha...*
Marmota of Klein; Marmota Alpina of Blumenbach; Marmota of Buffon; Marmothica of Kramer and of Meyer; and Alpenmarmothier of Schrank.

Description.—Cheeks large; ears round and short, hid in the fur; body stout; head and upper parts brownish ash mingled with tawny; legs and under parts reddish; tail rather full; length from nose to tail, about 16 inches; of the tail, 6.

Habits, Locality, &c.—This well-known species is found in the Alps and Pyrenees. When, it is said, on the summits of those mountain-chains. They live in little societies, feeding on roots and vegetables, and occasionally on insects. Their holes are formed in the ground, generally with three chambers in the shape of a Y, with two entrances. These apartments are comfortably lined with moss and hay, and to them the Marmots retire about Michaelmas, having stopped up the entrances with earth, there to doze away the inclement months, till the warm suns and showers of April arouse them from their torpidity to partake of the renewed vegetation. From five to a dozen are said to be lodged in a chaubier. They lift their food to their mouths with their fore-feet, eat it sitting, and will walk on their hind-feet. When on their feed a sentinel is placed to watch, and on the approach of danger his whistle drives them instantly to their subterranean retreats. They are playful creatures, but when angry or before a storm pierce the ear with their shrill whistle. Though they soon become tame, and will eat almost anything, they bite very hard when offended. Mice place them greatly and they lap it with satisfactory murmurs. They become fat, and are sometimes eaten; but they are taken by the Savyards and others principally that they may be exhibited by those itinerants. The number of young at a birth is generally three or four.

Quebec Marmot

N.B. This species has a slight folding of the lining of the mouth, forming the rudiment of a check-pouch.

(Richardson.)

Pouched.

Spermophilus. (F. Cuvier.)

Dental Formula as in Arctomys. The molars are narrow.

Cheeks with large pouches. Teeth narrow and free. Wool covered with hair, hind toes naked.

Example. Arctomys (Spermophilus) Parryi.

Description.—Ears very short, body thickly spotted above with white on a grey or black ground, pale rust-coloured beneath, face chestnut-coloured, the tail one-third longer than the hind feet, stretched out flat, black at the extremity, with a narrow white margin, rust-coloured beneath; length of head and body 8 inches 6 lines, of tail (vertebrae) 1 inch 6 lines.

This, according to Dr. Richardson, who first named the species, is the Ground Squirrel of Hearne; the Quebec Marmot of Forster; the Seek-Seek of the Esquimaux; the Tho-tha (Rock Badger) of the Chepewyans; and the Arctomys Altina of Parry's "Second Voyage."

Locality, Habits, &c.—The Doctor informs us that this Spermophile inhabits the barren grounds skirting the sea-coast from Churchill in Hudson's Bay round by Melville Peninsula, and the whole northern extremity of the continent to Behring's Straits, where specimens precisely similar were procured by Captain Beuchley. It is abundant in the neighbourhood of Fort Enterprise, near the southern verge of the Barren Grounds, in lat. 65°, and is plentiful in Cape Parry, one of the most northern parts of the continent. It is found generally in stony districts, but seems to delight chiefly in sandy hillocks amongst rocks, where burrows, inhabited by different individuals, may be often observed crowded together. One of the society is generally observed sitting erect on the summit of a hillock, whilst the others are feeding in the neighbourhood. Upon the approach of danger, he gives the alarm, and they instantly hurry to their holes, remaining however chattering at the entrance until the advance of the enemy obliges them to retire to the bottom. When their retreat is cut off, they become much terrified, and, seeking shelter in the first crevice, they not unfrequently succeed only in hiding the head and fore part of the body, whilst the projecting tail is, as is usual with them under the influence of terror, spread out flat on the rock. Their cry, in this season of distress, strongly resembles the loud alarm of the Hudson's Bay Squirrel, and it is not very unlike the sound of a watchman's rattle. The Esquimaux name is an attempt to express this sound. Hearne states that they are easily tamed, and very cleanly and playful when domesticated. They never come abroad during the winter. Their food appears to be entirely vegetable; their pouches being generally filled, according to the season, with tender shoots of herbaceous plants, berries of the alpine arbutus, and of other trailing shrubs, or the seeds of grasses and leguminous plants. They produce
about seven young at a time. *Pinnia Boreali-Americana.* Dr. Richardson's figure, from which the cut is taken, was drawn from a specimen procured from the banks of the Mackenzie.

The genus *Aulacodus* of Temminck is placed by Dr. Fischer between *Dipus* and *Arctomys*.

Mr. Waterhouse, in his interesting 'Observations on the Rodentia, with a view to point out the groups, as indicated by the structure of the Crania, in this order of Mammals' (Mag. Nat. Hist., 1839), states the following as the principal genera of his section *Murina: Scutus, Arctomys, Myoxus, Dipus, Mus, Arvicola, Geomys,* and Castor. The principal genus in the section *Hystrixinae* are, according to the same author, *Bathyergus, Poephagomys, Octodon, Abrocoma, Myopotamus, Capromys, Echimys, Aulacodus, Hystrix, Dasypodictis, Chimachilla, and Hydrochoerus.*

In the 'Zoology of H. M. S. Beagle' (Sept., 1839), Mr. Waterhouse says that he has been induced, by the differences there pointed out in the molar teeth of the two groups, to separate the South American Mice from those of the Old World, or rather from that group of which *Mus decumanus* may be regarded as the type, and to place them together with such North American species as agree with them in dentition, in a new genus bearing the name of *Hesperomys.* Mr. Waterhouse will not venture to say whether this group may be confined to the western hemisphere or not; but he thinks that he may safely affirm that that portion of the globe is their chief metropolis. In the species of *Hesperomys,* he observes, the molar teeth are always rooted; and in the form of the skull and lower jaw they agree with the *Murider,* and do not present the characters pointed out by him as distinguishing the *Arvicolidae*; and, as regards the cranium and lower jaw, it is only in the genus *Neotoma* that any approach is evinced, in his opinion. Under the suborder *Odotitidae* he places the genera *Clemomys,* *Poephagomys,* *Octodon,* and *Abrocoma,* which last he states to be allied to the one hand to the genera *Octodon,* *Poephagomys,* *Clemomys,* and on the other to the family *Chinchillidae.* The *Odotitidae* appear to him to bear the same relation to *Echimys* as the *Arvicola* do to the *Muridae.*

Mr. Waterhouse has also characterized a new species of Hamster, *Cricetus auratus.* (Zool. Proc., 1839.)

1. *Campagnolus* des schistes de Bohéme (Cuv.).
2. *Campagnolus* des Causses (Cuv.).
3. *Petit Campagnolus* des Causses (Cuv.).

*Bone-caves, Kirkdale (Buckland, 'Reliq. Diluv.').

The same author remarks that the teeth and bones of *Water Rats* had been found by Cuvier to occur abundantly in many of the caves; breccias from the shores of the Mediterranean and Adriatic, and that the Baron had also in his collection a large mass from Sardinia, composed exclusively of the bones and teeth of these animals, nearly as white as ivory, and slighted together by delicate amalgamite. (Reliquiae Diluvian.)

Mr. Waterhouse has also characterized a new species of *Myoxus.*

1. *Loir des plâtrières* (Cuv.), Gypsum of Montmartre.
2. *Second Loir des plâtrières* (Cuv.), Gypsum of Meudon.
3. *Myoxus primigenius* (Mayer, Arctomys peronii, Kaup). Another *Myoxus* is recorded from the *Eningen* beds. Dr. Buckland, in his 'List of Vetebrae,' records two small species of Dormouse, those above noticed as probable, as extinct species.

Mus.

1. *Mus Musculus fossili* (Karg). *Eningen* beds. Remains of Mice have also been found in the bone-caves of European breccias. Thus Dr. Buckland describes a form ('Reliq. Diluv.,' p. 15, pl. 11) the jaw and teeth of a mouse from Kirkdale Cave. In the Eocene formation (iacustrum of Cournon, in Auvergne, a *Rat* is recorded as one of the animals found with the fossil eggs of aquatic birds.

*Cricetus.* (HAMSTR.)

*Dipus. (Gerbillus, Desm.; Meriones, Ill.)

Remains of this form are recorded in the Tertiary beds of Bashan Blanca, in a cliff of red earth, part of the head of a *Clemomys*; the species being different from the *Tucutuco,* but with a close general resemblance.

*Spermophilus.*

Mr. Darwin found at Bahia Blanca, in a cliff of red earth, part of the head of a *Clemomys,* the species being different from the *Tucutuco,* but with a close general resemblance.

*Eppesinum.*

Spermophilus *superbificus* (Kaup). *Tertiary: Eppesinum.*