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COTES, ROGER, was born July 10, 1682, at Burbage, near Leicester, of which place his father was rector. His first education was received partly at Leicester school, partly from an uncle, who was the father of Dr. Robert Smith, the author of the 'Optics.' He was afterwards placed at St. Paul's School, London, and in 1699 was admitted at Trinity College, Cambridge, of which foundation he was elected Fellow in 1705. In January 1706 he was elected Plumian Professor, at the time of the establishment of that Chair. In 1713 he took orders. He died June 5, 1716, aged thirty-four, and is buried in the chapel of his college, where there is an epitaph upon him by Dr. Bentley. He was succeeded in the Plumian professorship by his cousin, Dr. R. Smith, the editor of his works.

The early death of Cotes being taken into account, few persons have left more reputation behind them than he did, in matters of exact science. Newton is reported to have said, 'If Cotes had lived, we should have known something.'

The first work which Cotes published was the second edition of Newton's 'Principia' (A.D. 1713), to which he prefixed the well-known preface. This treats of gravitation in general, and of the objections which were made to it. He also published an account of a remarkable meteor in the 'Phil. Trans.' for 1715. His hydrostatical and pneumatical lectures were printed after his death, in 1738, by Dr. R. Smith.

The mathematical papers of Cotes were published after his death by Dr. Smith, under the title of 'Harmonia Mensurarum, sive Analysis et Synthesis per Rationum et Angulorum Mensuras promotæ: accedunt alia Opuscula Mathematica,' Cambridge, 1722. The most definite description which can be given of it is, that it was the earliest work in which decided progress was made in the application of logarithms and of the properties of the circle to the calculus of fluents.

COTES, FRANCIS, R.A., one of the originators of the Royal Academy of Arts in London, was born in London, in 1725. He was the pupil of George Knapton, and distinguished himself by his portraits in crayons, in which he was unrivalled; he was also a good painter in oil, and, in the opinion of Hogarth, a better portrait-painter than Reynolds: both painters had recourse to the same artist, Toms, for the painting of their draperies. Walpole mentions a few of his best works, as a full-length of the queen of George III. holding the princess royal on her lap, engraved by W. W. Ryland; Mrs. Child, of Osterly Park; and the beautiful daughter of Wilton the sculptor, afterwards the wife of Sir Robert Chambers. Many of his portraits have been engraved by Bartolozzi, Green, MacArdell, and others. He died, in consequence of taking soap-lees for the stone, in 1770, before he had completed his 45th year.

(Walpole, *Anecdotes of Painting*, &c.; Edwards, *Anecdotes of Painting*, &c.; Smith, *Nollekens and his Times.*)

COTIGNAC. [VAR.]

COTMAN, JOHN SELL, an artist whose masterly etchings of architectural subjects, old buildings and other antiquities, have obtained for him the honourable distinction of the English Piranesi, was born at Norwich, about the year 1780. He first practised chiefly in water-colour painting, in which he displayed a vigour and boldness very unusual at that period; but he afterwards applied himself more particularly to architectural drawing and engraving, and to etch upon copper views made for that purpose by himself. His first publication of the kind was his 'Miscellaneous Etchings of Architectural Antiquities in Yorkshire,' &c., in 28 plates folio, 1812; immediately succeeded by the 'Architectural Antiquities of Norfolk,' folio, 1812–1817; and he at the same time brought out the 'Sepulchral Brasses in Norfolk,' 84 plates, large 4to., 1813–1816. In 1817 he went to France, where he spent some time in collecting the materials for his next, and the finest of all his works, the 'Architectural Antiquities of Normandy,' which appeared in two volumes folio, 1820, with 100 plates, and descriptive and historical letter-press by Mr. Dawson Turner of Yarmouth. He afterwards settled entirely in London, and for a few years before his death, which took place some time in 1843, held the appointment of teacher of drawing in King's College, Somerset Place.

COTONEASTER, a genus of plants belonging to the natural order *Rosaceæ*, and to the tribe *Pomeæ*. There are several species. Only one British, *C. vulgaris*. The petals are rose-colour

It is a native of Europe; found in North Wales upon the cliffs at the Great Ormeshead. There are other species natives of the south of Europe and various parts of the East Indies. All the species are adapted for shrubberies, and many of them are very commonly cultivated in Europe.

COTOPAXI. [ANDES.]

COTTAGE ALLOTMENTS may be considered as such portions of land hired by labourers, either attached to, or apart from, their dwellings, as they, assisted by their families, may be able to cultivate without ceasing to let out their services daily to others. They are thus distinguished from larger portions of land which require some capital and the occupier's whole attention, and consequently partake more of the character of small farms. The object of cottage allotments is to increase the resources of the labourer; firstly, by supplying him with many necessaries and comforts which he would have a difficulty in purchasing from a portion of his wages, and which, if even he could do so, he would purchase at a great disadvantage; secondly, by enabling him to turn every thing to profit, so that nothing need be lost. With regard to the quantity of land which ought to be let to the labourer for this purpose, there has been much discussion. Various experiments have been tried, and the opinion of persons best informed upon the subject appears now to be, that a quarter of an acre is about the quantity which, without prejudice to his other employments, a labourer can in general thoroughly cultivate, and consequently derive the greatest profit from; but this, of course, will vary with circumstances. There have been many objections raised to this system, and it has not been carried into execution to any great extent. It yet remains to be determined whether the possession of a small piece of ground, as here understood, will or will not tend to raise the standard of comfort which a labouring man and his children may enjoy; or whether, in fact, such possession will not have a tendency directly the opposite to that which has been imputed to the system of small allotments of land.

For further information upon this subject see the publications of the Labourers' Friend Society, and the evidence taken before a Committee of the House of Lords upon the subject of the Poor Laws in 1831.

COTTBUS, or KOTTBUS. [BRANDENBURG.]

COTTIAN ALPS. [ALPS.]

COTTIN, SOPHIE RESTAUD, born in 1773, was brought up at Bordeaux by her mother, who was an accomplished and well-informed woman. At the age of seventeen she married M. Cottin, a wealthy Parisian banker, with whom she resided in the capital. Three years afterwards she lost her husband, which circumstance, added to the horrors of the revolution, induced her to retire to a cottage in the valley d'Orsay. Here she wrote a series of novels, 'Claire d'Albe,' 'Malvina,' 'Amelie Mansfield,' 'Mathilde,' and 'Elizabeth, or the Exiles in Siberia,' which was her last and her best work, the characters and sentiments of which are unexceptionable, the plan well conducted, and the termination satisfactory. 'Elizabeth' is accordingly a work which is generally put into the hands of young persons, and has been translated into most European languages. Madame Cottin, who was a Protestant, had begun a work intended to demonstrate the truth of the Christian religion by its sympathy with the best sentiments and affections of the heart, and another on education. She did not live to finish either: she died in August 1807, at the age of thirty-four, sincerely regretted by all who knew her. Most of her works were published anonymously. They were collected and published at Paris, in 5 vols. 8vo., 1817.

COTTON, probably derived from *Kutn*, one of the names given by the Arabs to this substance, is a filamentous matter produced by the surface of the seeds of various species of *Gossypium*. It consists of vegetable hairs, of considerable length, springing from the surface of the seed-coat, and filling up the cavity of the seed-vessel in which the seeds lie. Hairs are extremely common on the surface of plants; frequently however they are unobserved, in consequence of their small number and minuteness; while on the other hand, in some cases, they give plants, such as the Mullein for instance, a remarkably hoary appearance. On the surface of seeds they are uncommon; but in the Mallow tribe, to which the cotton plants belong, they not only exist abundantly on the seeds of that genus, but in several other species. Vegetable hairs are one of the many forms in which the cellular substance of vegetation is developed, and they consequently partake of two of the great characteristics of that form of tissue, namely, thinness and transparency. In the cotton they are long weak tubes, formed from cells which have grown together, and which, when immersed in water and examined under the microscope by transmitted light, look like flat narrow transparent ribands, presenting at short intervals a spiral twist, by means of which their surface is roughened, so that cotton goods are less soft than linen. This spiral twisting, which has been acquired during the rapid growth of the hair in the interior of the capsule of the fruit, is of essential importance in the working up of the cotton, as by this agency the individual hairs adhere more closely together, and are more easily woven. Sometimes a slight trace of fine grains is discernible in the interior, but more frequently the hairs seem empty; if strained singly, they have little strength and readily break, and it is only when many are entangled together that they acquire any appreciable degree of strength. In all these points cotton differs from the vegetable matter that constitutes linen; the latter consists of woody tissue, in the state of long tubes, but is at once distinguished by the tubes adhering in bundles, which it is difficult under a microscope to break up into their component parts; the tubes are thick-sided, and will not acquire a riband-like appearance when viewed in water, but rather resemble extremely minute thermometer tubes. When they are jointed together, the articulation is oblique, the ends of the tubes being pointed and overlying each other; and finally, in each particular tube of the woody tissue, delicate as it may be, there is a sufficiently appreciable degree of

toughness when an attempt is made to break it. In short, cotton is a development of the parenchymatous part of the gossypium; linen is a form of woody matter; hence it is easy to distinguish with certainty linen from cotton-manufactured articles, in cases of doubt; and hence also the well-known superiority of linen to cotton in strength: the latter is manufactured from the most delicate part of plants, the former from the toughest. Cotton is produced by many different species and varieties of the genus GOSSYPIUM.

Cotton-plants are found wild in both the old and new world. Herodotus and Arrian speak of the cotton-plant as indigenous in India, and the cloth found in Peruvian tombs sufficiently attests its having existed in that country long before it could possibly have been carried to America by eastern intercourse. In fact, the wild American cotton-plants are specifically different from those of the old world; but at the present day the cotton of the West is cultivated in Asia and Africa, while that of the East has long since been introduced into America.

The situations in which cotton-plants have been advantageously cultivated are included between Egypt and the Cape of Good Hope in the Eastern, and between the southern banks of Chesapeak Bay and the south of Brazil in the Western hemisphere. It has not been found to succeed beyond the parallels that limit those countries. In the equinoctial parts of America Humboldt found it at 9000 feet elevation above the sea; in Mexico as high as 5500 feet; and Professor Royle saw it at the elevation of 4000 feet on the Himalayas. It seems generally to prefer the vicinity of the sea in dry countries, and the interior districts of naturally damp climates. Thus, while the best cotton is procured in India from the coast of Coromandel, or other maritime districts, and in the southern states of the American Union from certain coast-islands, the coast cotton of Pernambuco is inferior to what is produced in the interior of that country. These facts lead to the inference that it is not merely temperature by which the quality of cotton is affected, but a peculiar combination of heat, light, and moisture; the most favourable instance of which may be assumed to be the coast of Georgia and the Carolinas, and the worst to be Java and the coast of Brazil.

COTTON CULTIVATION AND TRADE.

The distinctive names by which cotton is known in commerce are mostly derived from the countries of their production: the exceptions are Sea Island Cotton and Upland Cotton. The former of these was first cultivated in the low sandy islands near the coast of Charleston in America; while the latter is grown in the inner or upland country. The Sea Island Cotton is the finest of all the varieties of cotton. The Upland is often called Bowed Cotton.

In India, and many of the islands of the Indian Ocean, the cotton-plant has been cultivated, and its filaments spun and woven, from time immemorial. In Mexico the Spaniards found cotton in common use at the time of their conquest of the country. The Egyptians were acquainted in the time of Pliny with the use of cotton. The cotton-plant was very early known in China, and cultivated as an ornamental garden shrub; but its filaments were not brought into use until about the 13th century. The Saracens cultivated cotton in Spain and Sicily in the 10th century. The manufacture of cotton did not rise in other countries till a much later period. It was not until the 17th century that cotton goods were made in England; and even of these the warp was composed of linen and only the weft of cotton, until the invention of Arkwright afforded the means of producing good fabrics of cotton only. From that date (1769), the trade in cotton in this country has gone on increasing with astonishing rapidity. The quantity of cotton brought to this country in 1764 was about 4,000,000 lbs.; in 1780, about 7,000,000 lbs.; in 1790, about 30,000,000 lbs.; and in 1800, about 50,000,000 lbs. The imports did not increase very rapidly during the war; but since that time they have augmented in the following manner, taking an interval of five years between the respective dates:—

Years.	Pounds.
1815	99,000,000
1820	152,000,000
1825	229,000,000
1830	264,000,000
1835	364,000,000
1840	592,000,000
1845	721,979,953

Mr. Woodbury, the Secretary of the United States Treasury, has estimated the entire produce of cotton in all countries, at various periods, as follows:—

Years.	Pounds.
1791	490,000,000
1801	520,000,000
1811	555,000,000
1821	630,000,000
1831	820,000,000
1834	900,000,000

In 1791 the United States produced only $\frac{1}{20}$th of the entire quantity; in 1834 its share exceeded one-half; and in 1844 its produce was nearly double of that in 1834. More than half in value of the entire exports from the United States now consist in cotton wool. More than four-fifths of the entire cotton produce of the United States is purchased by Great Britain; and the quantity so purchased formed, in 1845, six-sevenths of all the cotton bought by Great Britain from all countries. Between the years 1791 and 1835, the price of United States' cotton fell pretty regularly from 1*s.* 6*d.* to 5*d.* per lb.; but in the Mississippi valley even 3*d.* per lb. will leave a profit to the grower. Land fresh brought under cultivation in that country will yield on an average from 1000 to 1200 lbs. per acre of cotton with the seed, which will yield 250 or 300 lbs. of cleaned cotton. In India, cotton can be raised at a charge of 1$\frac{1}{2}$*d.* to 2$\frac{1}{2}$*d.* per lb. to the producer, but of inferior quality. In the West Indies the charge of production is too high to contend with the United States' market. The best Sea Island is usually worth about four times the price per pound of the

inferior East Indian, all the other varieties being of intermediate price.

It is sometimes difficult to compare the trade of different periods, on account of the quantity of cotton being often estimated by *bales* instead of *pounds*. These bales contain on an average about 300 lbs. each. The following are the deliveries for home consumption in bales from Liverpool and from all the British ports, during the last eight years.

Years.	Liverpool.	Great Britain.
1840 . .	1,197,924	1,291,524 bales.
1841 . .	1,042,132	1,150,916 „
1842 . .	1,151,384	1,234,948 „
1843 . .	1,286,376	1,404,208 „
1844 . .	1,311,076	1,417,260 „
1845 . .	1,436,760	1,566,700 „
1846 . .	1,444,560	1,564,234 „
1847 . .	1,025,155	1,105,995 „

The total imports in 1847 were within a fraction of those in 1846 (1,233,994 bales against 1,243,694 bales), so that the diminution shown in the above table relates only to the quantity delivered for home consumption.

The market price per lb. of fair Bowed or Upland cotton at Liverpool, on the 31st December in successive years, was as follows:—1840, 6¼*d.*; 1841, 5¾*d.*; 1842, 5¼*d.*; 1843, 5¼*d.*; 1844, 4¼*d.*; 1845, 4¼*d.*; 1846, 7¼*d.*; 1847, 4¾*d.* The varieties and prices at Liverpool, in April 1848, were as follow:

	d.		*d.*
Bengal . . .	2¾ to 3¾	Para . . .	4½ to 5¼
Madras . .	2 „ 4¼	Demerara .	5 „ 7½
Surat . . .	2¾ „ 4	Grenada . .	4½ „ 5½
Bowed Georgia	3¾ „ 4¾	Carthagena .	3¼ „ 3¾
New Orleans	3¾ „ 6½	Egypt . .	5¾ „ 8
Pernambuco .	5¼ „ 6½	Smyrna . .	4½ „ 6
Maranham .	5 „ 6	Peru . . .	4¾ „ 6
Bahia . . .	5 „ 6		

The cotton wool imported into Great Britain in 1845 was brought from the following countries:—

	Pounds.
United States	626,650,412
East Indies	58,437,426
Brazil	20,157,633
Turkey and Egypt . .	11,522,698
British West Indies . .	1,394,447
Various British Colonies .	38,888
Various Foreign Countries	3,778,449
Total . .	721,979,953

The import duty on cotton wool, which amounted to five-sixteenths of a penny per lb., produced in 1843 a revenue of 736,546*l.*, and in 1844 a revenue of 672,614*l.* It was repealed in 1845.

COTTON MANUFACTURES AND TRADE. The preceding article relates to the production of and trade in raw cotton. The present relates to manufactured or woven cotton.

Cotton was woven by the Hindoos and Chinese many centuries before the Christian æra. The Egyptians are supposed to have imported woven cotton before the plant had begun to be cultivated in their country; and the Romans received woven

cotton from India long before the cotton-plant was known in Europe.

The first Europeans who spun and wove cotton were the Italians of the commercial republics, who had become familiar with the material while exercising their trade as merchants between Europe and the East. From the 10th to the 13th centuries, cotton goods were manufactured to a large extent by the Moors of Spain, especially a coarse variety to which they gave the name of *fuste*, whence our 'fustian.' The other nations of Europe learned the manufacture of cotton, not from the Moors of Spain, but from the Christians of Italy. The art travelled from Italy to the Netherlands, and thence to England, where it was first practised in the beginning of the 17th century.

The extension of this manufacture has been far more rapid in England than in any other country. The details given under COTTON CULTIVATION AND TRADE will show, by the quantity of raw cotton imported in different years, how largely the manufacture must have increased year by year. Before Arkwright's time, it was the custom for the weavers, who were dispersed in cottages throughout the manufacturing districts, to purchase the material with which they worked, and, having converted it into cloth, to carry their wares to market, and sell them on their own account to the dealers; but about 1760 the merchants of Manchester began to employ the weavers, furnishing them with yarn for warp, and with raw cotton, which was spun by the weaver's family for the weft, and paying a fixed price for the labour bestowed in weaving. The Factory System, now so closely connected with the cotton manufacture, arose out of the invention of complicated pieces of machinery, which could not be worked in the cottages of the weavers. About 1760 James Hargreaves invented a carding-engine, to assist in straightening the fibres of cotton. In 1767 the same ingenious man invented the Spinning Jenny, by which a number of threads could be spun as easily as one thread by the old spinning-wheel. The saving of labour which this machine effected roused the jealousy of the spinners, who for a time prevented the new machine from coming into general use. This opposition however being overcome, the Spinning Jenny became generally used for spinning weft threads in the manufacture of cloth, wherein linen thread formed the warp. Arkwright patented in 1769 his Spinning Frame, by which cotton yarn could be woven strong enough for warp-threads. All attempts to produce fine muslin, although India-spun yarn was used as weft, were for many years fruitless; but in 1786 Samuel Crompton invented the Mule Jenny, by which yarn could be produced much finer and softer than any before wrought in this country.

This train of inventions led to an astonishing increase of manufacture. But the manufacturers were for a time subjected to much discouragement from the determination of the revenue officers to charge for cloth composed wholly of cotton double the duty payable upon calicoes woven with linen warp and printed for exportation, and also by prohibiting their use at home. With some difficulty an Act of Parliament was obtained for re-

moving these obstacles to the development of the manufacture, which from that time was prosecuted with a great and continually accelerated rate of increase. Of the inventors who gave the spur to this industry, Hargreaves and Crompton died comparatively poor, while Arkwright was enabled to accumulate enormous wealth. Some of Crompton's finest yarns were sold by him at 20 guineas per lb.: they can now be produced of the same fineness for 15 shillings!

Arkwright brought out a succession of improvements in the various processes of the manufacture; and since his time every year has added to the number, until the preparing and spinning machinery has reached an extraordinary degree of perfection. The first successful attempt to *weave* by machinery was made in 1785 by Dr. Cartwright; and Mr. Monteith of Glasgow was the first person to make use of the new method on a large scale. Radcliffe added efficiency to the power looms by the invention in 1804 of the Dressing or Starching Machine.

The processes connected with the preparation and spinning of the cotton fibres are described under ARKWRIGHT; COTTON SPINNING; SPINNING; and THREAD. The weaving of the yarn into piece-goods is described under FUSTIAN; VELVET; and WEAVING. The imparting of colour and design to the woven cloth is treated under BANDANA; COTTON or CALICO PRINTING; and DYEING. The statistics of the manufacture, in respect to the number of factories, power-looms, work-people, &c. are given under FACTORIES. Mr. McCulloch estimates that, allowing for old persons and children dependent upon those actually employed in the various departments of the cotton manufacture, and in the construction and repairs of the machinery and buildings required to carry it on, the entire manufacture in Great Britain must furnish subsistence for at least 1,250,000 persons.

Mr. Kennedy estimated the value of the cotton manufactures produced in Great Britain in 1832 at about 25,000,000*l.* Mr. Baines made the estimate for 1833 at about 31,000,000*l.* Mr. McCulloch's estimate for 1836 was about 34,000,000*l.* Mr. Porter's estimate for 1841 was about 49,000,000*l.* It is admitted that there are no exact data for determining these quantities; but the above are approximately correct. The capital invested is supposed to amount to 30,000,000*l.* or 35,000,000*l.*

The real or declared value of manufactured cotton goods exported from this country in various years was as follows:—

Years.	£
1820	16,516,748
1825	18,359,526
1830	19,428,664
1835	22,128,304
1840	24,668,618
1845	26,119,331
1846	25,600,693

The exports for 1845 were thus divided—There were 1,091,686,069 yards of piece-goods, estimated by the yard, and valued at 18,029,808*l.*; hosiery, lace, and small wares to the value of 1,126,288*l.*; and cotton twist and yarn, weighing 135,144,865 lbs., and valued at 6,963,235*l.* The largest exports of piece-goods were to the East Indies, China, Turkey, and Brazil; and the largest exports of twist and yarn to Germany, Holland, and Russia. The weight of cotton yarn contained in the piece-goods exported that year was 336,866,327 lbs.

The first cotton-mill built in the United States was set to work in Rhode Island in 1790, and about the same time one was erected at Beverley, Massachusetts, by an incorporated company. The manufacture made at first so little progress in the United States, that up to 1808 not more than 15 spinning-mills had been erected. After that date the increase was very rapid. In 1840 the number was 1240, which employed 2,284,631 spindles, and produced manufactured articles valued at 46,350,000 dollars. The capital invested was estimated at 51,000,000 dollars; and the number of persons employed, including dyers, printers, &c., was 72,119. The great demand for cotton goods within the States at first prevented any very considerable exportation; but the exports gradually became large. In 1842 the exports of cotton manufactured goods from the United States consisted of—

	Dollars.
Printed and coloured piece-goods . .	385,040
White	2,297,964
Twist, yarn and thread	37,325
Other cotton goods	250,361
Total	2,970,690

The quantity of cotton imported into France in 1787, the earliest year as to which any returns are given, was 4,466,000 kilogrammes, or not quite ten millions of pounds. It increased in 1840 to 52,942,000 kilogrammes (116,000,000 lbs.). In 1840 the quantity of cotton spun in France was about one-fifth of that used in our mills, and the value of the exports from France, nearly one-third of which are smuggled into Spain, was between one-fifth and one-sixth part of the value of the shipments from England. In 1820 the value of the exports of cotton-manufactured goods was 29,000,000 fr., and in 1840, 107,000,000 fr.; and the value of cotton twist exported in 1820 was 397,000 fr., and 593,000 fr. in 1840.

The cotton manufacture is of modern introduction in Switzerland. The first spinning-machine was established at St. Gall, in the year 1800; but Switzerland still imports considerable quantities of foreign-spun yarns for the use of her hand-loom weavers, as well as of power-loom cloths from England, which are dyed and printed, and afterwards exported.

Within the last few years the cotton manufacture has made great progress in the Rhenish provinces of Prussia and in Saxony, and also, though to a smaller extent, in Würtemberg and Baden. It is one of the objects of the German Customs' Union to foster the cotton and other manufactures by high duties on the cheaper products of England.

COTTON SPINNING. The spinning of

cotton into the form of yarn, or thread, requires many preparatory processes. The first of these consists in mixing the contents of different bags together, to equalise the quality. This is done by spreading out the contents of each bag in a horizontal layer of uniform thickness, the contents of the several bags forming separate layers and resting one upon the other, so that the number of layers corresponds to the number of bags. The cotton of which this heap or *bing* is composed is then torn down by a rake from top to bottom. It is evident that in its progress a portion of each horizontal layer will be brought away, and that thus, if the work be skilfully done, the contents of the different bags must be collected together in a mass of uniform quality. The mode of conducting the mixing depends on the quality of yarn required.

The *scutching-machine* is used to open the locks of cotton and separate its fibres, while at the same time it separates from it any sand or seeds which it may contain. This machine consists of feeding-rollers made of wood, and placed at a short distance from each other, through which the cotton is made to pass slowly, after passing through which it is struck by a set of beaters made to revolve 1600 or more times in a minute. The cotton is thus passed through two sets of rollers, and subjected to two sets of beaters.

Up to this stage the fibres of the cotton cross each other in every direction. The use of the *carding-engine* is to disentangle them, to draw them out, and to lay them parallel to each other. The card is a species of brush made of short wires passed through a sheet of leather and pointing all in one direction. In the early period of cotton-spinning in this country, these cards were nailed on small pieces of board with handles, and two of them were used together, one held in each hand. Hargreaves invented an improved arrangement of cards in 1760; but this gave way to the cylinder machine, now universally employed. This consists of a horizontal cylinder covered with narrow fillet cards, studded with wires. Over the cylinder is a concave frame, the interior surface of which is lined with cards, and the form of which corresponds to that of the cylinder. When the cylinder is made to revolve, the cards on it and on the frame work against each other, by which means the fibres of cotton are disentangled and properly arranged, as already mentioned. The cotton is spread out into a sheet of given length and breadth, and placed so that the teeth of the carding-engine can catch it and draw it in. A sort of comb draws the fibres of cotton off the teeth when the carding is effected; and the cotton passes through two rollers into a tin can, where it assumes a light fleecy form called a *sliver*.

The next operation, that of *drawing*, has for its object the arranging of the fibres of cotton longitudinally, in a uniform and parallel direction, and to remedy all existing inequalities in the thickness of the sliver. The *drawing-frame* acts upon the same principle as Arkwright's spinning-frame, two sets of rollers being employed moving with unequal velocities. The cotton is drawn several times, to attain the utmost regularity.

Roving, the next step in the process, is a continuation of the drawing, with this only difference, that the cord, now called a *rove* or *slub*, being so much reduced in thickness that it will not otherwise hold together, a slight twist is given to it by passing it into a conical can, which, while receiving it, is made to revolve with great velocity. The rove, thus slightly twisted, is wound upon bobbins by children, and is then ready for the spinning-frame. The *fly-frame* and the *tube-frame* are two machines employed in this process.

The principle of Arkwright's *spinning-frame* has been already explained. [ARKWRIGHT.] The *throstle-frame* is the same in principle as Arkwright's invention, but the movement of the parts is simplified. A throstle-frame now contains from 70 to 150 spindles on each side; and one young woman can manage the double set, from 140 to 300 spindles. The Mule Jenny, invented by Samuel Crompton, combines the essential principle of Arkwright's frame with the property of stretching possessed by Hargreave's Jenny. By means of the mule-jenny, the roving is first drawn and then stretched. The effect of this improvement is to make the yarn finer, and of a more uniform tenuity. The spindles in this machine are regularly arranged on a carriage, which, when put in motion, recedes from the rollers with a velocity somewhat greater than that at which the reduced rovings are delivered from them; during this time the yarn is receiving its twist by the rapid revolving of the spindles, and, when the rollers are made to cease giving out the rovings, the mule-jenny still continues to recede, but with a slower motion, and its spindles to revolve, and thus the stretching is effected. When the drawing, stretching, and twisting of the thread are thus accomplished, the mule disengages itself from the parts of the machine by which it has been driven, and then the attendant spinner returns the carriage to the rollers, again to perform its task. While returning to the roller, the thread which has been spun is wound or built on the spindle in a conical form, and is called a cop. The mule-jenny has become a 'self-acting machine,' by some beautiful inventions of Messrs. Sharp and Roberts, at Manchester. Some of the modern double self-acting mules contain 2200 spindles, all managed by one man.

The spun yarn is reeled into hanks containing 840 yards. Yarn of *low* numbers, or below 40 hanks to the lb., is generally spun by the throstle; but *high* numbers, or fine yarn, is more frequently spun by the mule. At Houldsworth's Mill, at Manchester, yarn has been spun to the astonishing degree of fineness of No. 460; that is, 460 × by 840, or 386,400 yards, or nearly 220 miles in length, from 1 lb. of cotton. Such yarn is worth five times its weight in silver. It was spun for a muslin dress for her Majesty.

COTTON or CALICO PRINTING is the art of staining woven fabrics of cotton with various figures and colours.

This art has been practised from time immemorial in India. Pliny ('Nat. Hist.,' b. xxxv. c. ii.) describes a mode which was adopted by the Egyptians in staining cotton cloth, evidently similar to the modern process of employing wood-cuts. In India, not only is the art of using

wood-cuts well known, but also that of applying 'resist-pastes,' in order to preserve the cloth from the action of the dye-bath in any desired figures or spots. Processes of printing, similar to the Indian, have been long practised in Asia Minor and in the Levant; but they were not attempted in Europe till about the middle of the 17th century. The first print-ground in England was established near Richmond, in Surrey, in 1696; but it was not till the year 1768 that the business was carried into Lancashire, where it now constitutes one of the most interesting and productive branches of English manufactures. From its outset the printing of cotton goods encountered the keenest hostility from the silk weavers of Spitalfields; and it was not till 1831 that printed cottons were relieved from the burdens thrown on them by 'protection.'

Calicoes, muslins, &c. intended for printing are first of all freed from their fibrous down by the action of the singeing machine. This consists either of a semi-cylinder of iron or copper, laid horizontally, and kept at a bright red heat by a furnace, or of a horizontal range of gas-jet flames: over one of these the plain of cloth is drawn with a steady continuous motion, and at a rate suited to its texture. The cotton cloth is next well bleached [BLEACHING], because, the whiter it is, the more light it will reflect from its surface, and the more brilliant will be the colour of its dyes. The goods are next rinsed, dried, and sometimes smoothed under the calender. If they are not calendered, they are run through a machine called in Lancashire the *candroy*, which spreads them smoothly in the act of rolling them upon a cylinder.

There are four mechanical modes of printing calicoes: first, by small wooden blocks, worked by hand; second, by large wooden blocks, set in a frame, and worked by a machine called the *Perrotine;* third, by flat copper plates (a method now nearly obsolete); and fourth, by copper cylinders.

The blocks are made of sycamore wood, or of deal faced with sycamore. They are about ten inches long and five broad, with an arched handle on the back for holding them by. The face is either cut in relief into the design required, or the same object is obtained by the insertion edgewise into the wood of narrow slips of flattened copper wire in the desired configurations. These narrow fillets have one edge inserted into the wood, are fixed by the taps of a light hammer, and are all filed down and polished into one horizontal plane, to secure equality of impression in the several lines. The interstices between the copper ridges are filled up with felt-stuff. Occasionally both the wood-cutting and insertion plan are combined in one block.

Calico printing by hand is performed by applying the face of the block to a piece of woollen cloth stretched over one end of a sieve-hoop, and imbued with a colouring matter of a thin pasty consistence by means of a flat brush. The block is then applied to the surface of the cotton cloth while extended upon a flat table covered with a blanket, and the impression is transferred to it by striking the back of the block with a light mallet. This method, besides the great cost of labour which it involves, has the inconvenience of causing many irregularities in the execution of the work. It has been superseded to a considerable extent, both in France and Belgium, by the Perrotine. Three thin wooden blocks, engraved in relief, about three feet long, and from two to five inches broad, are successively brought to bear on three of the four faces of a prismatic roller of iron, round which the cloth is successively wound. Each block rests on springs, which enable it to press with the delicacy of a skilful arm; and each receives its peculiar-coloured paste from a woollen surface imbued by a mechanical brush in rapid alternation. In England a machine has been introduced in which three or more oblong blocks are laid side by side, and are imbued with different colours all at the same time, from a trough arranged for the purpose.

The cylinder-machine consists of a hollow cylinder of copper about three feet long and three or four inches in diameter, whose surface is engraved, not by the hand-graver, but by the mechanical pressure of a steel roller from one to two inches in diameter and three inches long, which transfers the figures engraved on it to the relatively softer copper. The first steel roller, called the die, is softened before being engraved in intaglio; it is then hardened, and made, by a powerful press, to transfer its design in relief to a similar die called the *mill*, which is the one used for transferring the design to the copper cylinder. The process of etching is also sometimes had recourse to for covering the cylinder with various figures.

The engraved cylinders are mounted upon a strong iron shaft or arbor, carrying a toothed wheel at its end, in order to put it in train with the rotatory printing machine, for one, two, or more colours. On a roller, at the upper part of this apparatus, are wound whole calico webs stitched together, the end of which is then introduced between the engraved copper cylinder and a large central cylinder covered with blanket, against which it is made to bear with regulated pressure. The engraved cylinder turns on the top of another cylinder covered with woollen cloth, which revolves with the former while its under part is plunged in an oblong trough containing the dyeing matter, which is of a pasty consistence. The engraved cylinder is thus supplied with *an abundance of impressible colour*, and is cleared from the superfluity by the thin edge of a flat ruler made of bronze, called vulgarly the doctor (*ductor*), which is applied obliquely to it with a gentle force. The cylinder, after its escape from this wiping tool, acts upon the calico, and rolls it onwards with its revolution, imparting its figured design with great precision. One single machine will print calico at the rate of a mile an hour.

Dye-stuffs, capable alone of imparting fast colours to calico, have been called *substantive;* and such as require the intervention of a mordant, *adjective.* Indigo, catechu, and certain metallic oxides belong to the former class; madder, cochi-

neal, and Persian berries to the latter. There are five general styles of work in calico printing:—1, The fast-colour or chintz style, in which the mordants are applied to the white cloth, and the colours of the design are afterwards brought up in the dye-bath. 2, Where the whole surface receives a uniform tint from one colouring matter, and figures of other colours are afterwards brought up by chemical discharges and reactions. This is called the Rongeant style in France. 3, Where the white surface is impressed with figures in a resist-paste, and is afterwards subjected to a general dye, such as the indigo-vat. 4, Steam-colours, in which a mixture of the mordants and dye-extracts is applied to the cloth, and the chemical combination is effected by the agency of steam. 5, Spirit-colours, consisting of mixtures of dye-extracts with nitro-muriate of tin; these cannot be exposed to a steam heat without corroding the cloth: this style is brilliant, but fugitive.

There are only three bases which are of much importance as mordants—clay, iron, and tin. The first is commonly employed in the state called acetate of alumina; the second, acetate of iron; and the third, nitro-muriate, and oxymuriate, or perchloride, of tin. The first mordant is prepared by the makers of wood vinegar, who decompose alum by acetate of lime. It is called red liquor, because it is the mordant for reds in calico printing. The second mordant is made by exposing iron turnings to the action of crude vinegar. The third mordants are prepared by the ordinary chemical means. The tint or shade of colour produced in the dyeing-bath is proportional to the strength of the mordant previously applied to the cloth. The thickening of mordants is one of the most important operations in calico printing; for the permanence and beauty of the impression depend not a little on the consistence and quality of the inspissating substance. The substances usually employed for thickening are flour starch; flour; roasted starch; gum Senegal; gum tragacanth; salep; pipe-clay mixed with gum Senegal; potato starch; sulphate of lead and gum; sugar; treacle; glue.

In printing in the chintz or madder style upon a white ground, one or more mordants are applied, formed of different chemical substances, according as the colour is to be black, red, puce, or violet. The mordant is printed either by the machine or by the block. The cloth, after the printed mordant is dry, is next *dunged*, that is, it is dipped into a solution of cow-dung; or, for delicate pinks, yellows, or lilacs, a solution of bran is employed instead. The objects of this process are to combine some of the chemical agents with the cloth, to dissolve and separate some of the thickening material, and to remove the uncombined portions of the mordants. The cloth is then rinsed, and afterwards dyed in a solution of madder, to which sumach is sometimes added; sometimes the maddering is repeated a second time, and the cloth is again washed or rinsed. Next comes the application of the grounding-colours or topical dyes. These colours used, in the early history of the art, to be applied with a pencil, but they are now applied by a cylinder.

In the printing of yellows, greens, purples, pinks, and browns, different colouring substances are used, and different processes adopted for causing the colours to combine permanently with the cloth; but they all possess a common character, inasmuch as mordants are applied to the white cloth, and the colours of the design are afterwards brought up in the dye-bath.

In the second style of printing, where a general dye is given to the cloth, and variously coloured figures are produced by discharging portions of the ground, the ground-colour and the discharge must bear a certain chemical relation to each other. Various discharge-pastes are used: one of them consists of oxalic acid, tartaric acid, lime-juice, pipe-clay, and gum; another consists of nitro-muriate solution of tin, thickened with wheat-flour; another is similar to the above, with the addition of a decoction of Brazil wood; another consists of lime-juice, tartaric acid, nitrate of lead, pipe-clay, and gum. There are various other discharge-pastes. In all these cases the discharge, which is printed on the cloth by block or cylinder, acts chemically on the ground-colour previously applied, and enables it to be removed by subsequent washing; so that that portion only of the ground colour remains which is not subsequently printed over by the discharge-paste.

In the third style of printing, where the white surface is impressed with figures in a resist-paste, and the cloth afterwards dipped in a dye-vat, the principle of the process consists in the resist-paste wholly shielding those parts which it covers from the action of the dye, so that the dye-colour can afterwards be washed from those parts. These resist-pastes are various: one consists of acetate and sulphate of copper, acetate and sulphate of lead, and gum; another consists of nitrate and subacetate of lead, acetate of copper, gum, and pipe-clay; a third consists of corrosive sublimate, pipe-clay, gum, and olive-oil. The resist-paste is generally printed on the cloth by a cylinder machine; the cloth is then dyed in a vat or bath; and the resisted portions are cleansed and brightened by subsequent processes.

In the fourth style of printing, the agency of steam is applied to aid in fixing the colours to the cloth. The cloth is first steeped in a mordant liquor; then printed by the cylinder with various colours, which for their peculiar properties are called *steam-colours*. The cloth is hung up to dry, and when dry it is exposed to the action of dry steam. This is done by five different kinds of apparatus—the column, the lantern, the cask, the steam-chest, and the chamber. The first of these, which is most frequently used, is a hollow copper cylinder about 45 inches long by 2 to 6 in diameter, perforated along its whole surface with small holes one quarter of an inch apart. To the lower end of the column a circular plate is soldered, which serves to prevent the cloth coiled round the cylinder from falling down from it. The bottom of the hollow cylinder is terminated by a tube one inch wide, which fits tight into the socket of an iron chest beneath it, into whose side the steam-pipe of supply enters. The goods printed with the steam-colours and properly dried

are lapped tight round this hollow cylinder, and covered exteriorly with an envelope of strong cotton cloth, blanket-stuff, or flannel. The steam is then let on, and continued for 20 or 30 minutes, according to the nature of the dyes. The steam being stopped, the printed goods are rapidly unrolled from the column while still hot, lest any condensation of vapour should take place to stain them.

In the fifth style of printing, the colours are generally combined with nitro-muriate of tin; and the general arrangements are such as to produce brilliant but rather fugitive colours.

The following were the actual processes for four specimens of calico printing now before the writer:—The first specimen consists of purple squares separated by white lines. The cloth was bleached; the squares were printed by cylinder with a mordant of acetate of iron; the cloth was then stoved, dunged, washed, and immersed in phosphate of soda; then dyed with madder, which gave a purple tint to the parts printed with the mordant, but left the rest white; then soaped, washed in chloride of lime, rinsed, pressed, and dried. The second specimen displays white spots and black flowers on a purple ground. The white and black parts were printed both at once by a two-cylinder machine, with lemon-juice to act as a resist for the white, and acetate of iron to act as a mordant for the black; the purple part was then printed by a different cylinder; and the dyeing, clearing, and washing were superadded to these printings. The third specimen has three different shades of pink, one forming the ground and two the device. Acetate of alumina in three different degrees of strength was employed as a mordant, so as to retain with three different degrees of force the pink dye upon the cloth; two of the shades were printed at once by a double-cylinder machine; and the other was afterwards printed by a third cylinder. The remaining specimen exhibits yellow, green, black, and two shades of red, upon a white ground. It went through between thirty and forty processes connected with the printing; it passed twice through cylinder machines, and three times through the hands of the block printers, to apply either the colours themselves, or the mordants or resists by which the colours are affected.

The designs for calico printing are very costly. A copper cylinder is worth from 5*l.* to 7*l.*; and the engraving costs from 5*l.* to 10*l.* more. A constant succession of new patterns must be kept up by the manufacturer, to produce 'novelties' for the season. Some of the Lancashire firms expend as much as 5000*l.* a year in designing and engraving new patterns. Property in these designs is secured by law. [COPYRIGHT.] The art of designing now receives encouragement from the government. [DESIGN, SCHOOLS OF.]

In the year ending June 1846, the printed and dyed cotton goods exported from this country amounted to 327,465,580 yards.

COTTON-TREE. [BOMBACEÆ; BOMBAX.]

COTTON, GUN, was first discovered by M. Schönbein of Basel, and made known in the year 1846. It is prepared with cotton wool, and explodes at 400° Fahr. Gunpowder explodes at 600°. In consequence of this, gun-cotton may be fired on gunpowder without igniting it. This peculiarity results from the minute division of the cotton fibres; for mealed powder, or gunpowder dust, will explode at a much lower temperature than grained powder.

Gun cotton may be prepared in various ways. Mr. Taylor made it by saturating cotton wool in a mixture consisting of equal quantities of nitric and sulphuric acids. This must be done as rapidly as possible by pressing the cotton in the mixture with a glass rod. When this is done, it is taken out, and as much as possible of the mixture is squeezed out of it. The cotton is then washed in successive portions of water until it loses all taste of acid. It is then pressed in a linen cloth and dried. Sawdust, wood-shavings, and any body consisting principally of carbon, may be rendered explosive by preparation in a similar way.

The manufacture and use of these preparations are however dangerous, and they have in consequence been prohibited generally in France. Gun cotton is more powerful than gunpowder, *i.e.*, with equal quantities by weight a much greater effect is produced by the cotton; in consequence of which there is every probability that it will supersede powder for the purposes of blasting, for which it possesses the important advantage that it does not generate smoke. It remains however to be proved whether it will answer for military purposes. The experiments of the French government are against it, in consequence of the production of an inconvenient quantity of moisture by its explosion. M. Schönbein has secured the patent for his preparation in England, and it is manufactured on his account by agents appointed by him.

COTTON, SIR ROBERT BRUCE, an eminent English antiquary, descended from an ancient family, was the son of Thomas Cotton, Esq., and born at Denton, in Huntingdonshire, January 22, 1570. He was educated at Trinity College, Cambridge, where he took the degree of B.A. in 1585. His taste for antiquarian studies induced him to repair to London, where he became a member of a society of learned men attached to similar pursuits. He soon distinguished himself as a diligent collector of records, charters, and instruments of all kinds relating to the history of his country. The dissolution of monasteries, half a century before, had thrown so many manuscripts of every description into private hands, that Mr. Cotton enjoyed peculiar advantages in forming his collection. In 1600 he wrote 'A Brief Abstract of the question of Precedency between England and Spain,' which is still extant in the Cottonian library. ('Jul.,' c. ix. fol. 120.) Upon the accession of King James I. he received the honour of knighthood, and during this reign was not only courted and esteemed by the great, but consulted as an oracle by the privy councillors and ministers of state upon very difficult points relating to the constitution. In 1608 he was appointed one of the commissioners to inquire into the state of the navy which had been neglected after the death of

Queen Elizabeth, and drew up 'a memorial of their proceedings to be presented to the king, a copy of which is also preserved in the Cottonian library. (MS. 'Jul.,' F. iii.) In 1609 he wrote 'A Discourse of the lawfulness of Combats to be performed in the presence of the King, or the Constable and Marshall of England,' which was printed in 1651 and in 1672. He drew up also, in the same year, 'An Answer to such Motives as were offered by certain Military Men to Prince Henry, to incite him to affect Arms more than Peace.' This was composed by order of that prince, and the original manuscript remains in the Cottonian library. ('Cleop.,' F. vi. fol. 1.) New projects being contrived to fill the royal treasury, which had been prodigally squandered, none pleased the king, it is said, so much as the creating a new order of knights, called baronets; and Sir Robert Cotton, who had been the principal suggester of this scheme, was, in 1611, chosen to be one, being the thirty-sixth on the list. He was afterwards employed by King James to vindicate the conduct of Mary, queen of Scots, from the supposed misrepresentations of Buchanan and Thuanus. In 1616 the king ordered him to examine whether the Papists, whose numbers then made the nation uneasy, ought by the laws of the land to be put to death, or to be imprisoned. This task he performed with great learning, and produced upon that occasion twenty-four arguments, which were published afterwards, in 1672, among 'Cottoni Posthuma.' It was probably then that he wrote a piece, still preserved in the Royal Library, entitled 'Considerations for the repressing of the Increase of Priests, Jesuits, and Recusants, without drawing of blood.' Sir Robert Cotton wrote various other works, many of them small pieces in the shape of dissertations, too numerous to be mentioned here; some of them are among his Posthuma, others are printed in Hearne's 'Discourses,' and a few more still remain in manuscript.

As early as 1615, Sir Robert Cotton's intimacy with Carr, earl of Somerset, laid him under suspicion with the court of having some knowledge of the circumstances of Sir Thomas Overbury's death. He was even committed to the custody of an alderman of London; nor, although nothing could be proved against him, was he released from this confinement till the end of five months, during which time he appears to have been interdicted the use of his library.

Being a member of the first parliament of King Charles I., Sir Robert Cotton joined in complaining of the grievances which the nation was said, in 1628, to groan under, but was always for mild remedies, and zealous for the honour and safety of the king. In the next year an occurrence took place, the consequences of which shortened his days. A tract was handed about in manuscript, entitled, 'A Project how a Prince may make himself an absolute Tyrant.' Although Sir Robert Cotton completely vindicated himself from having written or disseminated this tract, so destructive to the liberties of the people, yet under the renewed pretence that his library was not of a nature to be exposed to public inspection, it was again put in sequestration, and himself once more excluded from all access to it. He died at his house in Westminster, May 6, 1631.

By his will Sir Robert Cotton directed that his library should not be sold, but should pass entire to his heirs; and it was much augmented by his son, Sir Thomas Cotton, and his grandson, Sir John Cotton. In 1700 an act of parliament passed for the better securing and preserving this library in the name and family of the Cottons, for the benefit of the public; the mansion house, in which the library was contained, to be preserved for the use of the descendants of Sir Robert Cotton, the founder, for ever, and the library to be made publicly accessible; and to be vested after Sir John Cotton's death in trustees. Sir John Cotton died in 1702. Another act of parliament was then framed, which passed in 1706, by which the purchase of the house was effected for the sum of 4500*l.*, and that and the library vested thenceforth in the queen, her heirs, and successors for ever, the management of the library being still settled in trustees. After several removals and suffering from a fire in 1731, it was transferred to the British Museum in 1757 by an act of parliament, which directed that two trustees, to be nominated in succession by the representatives of the Cotton family, should be for ever added to those appointed by the same act for the general execution of its purposes.

Besides the library of manuscripts, the Cottonian collection contained a considerable number of valuable coins, chiefly Saxon and old English; and several antiquities Roman and English, all of which are now incorporated in the collection of the British Museum.

COTTON, CHARLES, was born in 1630, at Beresford Hall in Staffordshire, which was afterwards the chief place of his residence. He was educated at Cambridge, and travelled on the Continent, after which he married, and lived principally in the country. He died at Westminster, in 1687. His name is best secured against forgetfulness by his friendship for Izaak Walton, and his co-operation in the later editions of the 'Complete Angler.' But he was an active translator, from the French, of Montaigne's 'Essays,' which translation has great merit, of historical and other prose works, and of Corneille's 'Horace;' and he published also various productions in verse, both serious and comic. His most ambitious poem of the former class is 'The Wonders of the Peak;' but he is more generally known as the author of 'Scarronides, or Virgil Travestie,' a burlesque imitation of three books of the Æneid. His prose imitations of Lucian, and his 'Voyage to Ireland' in verse, are much better specimens of his talents for humour. There are several incomplete collections of his works.

COTTUS (Linn.), a genus of fishes of the section *Acanthopterygii* and the family *Loricati*, Jenyns (Fam. des Joues Cuirassées, Cuvier). Head large and depressed, furnished more or less with spines or tubercles; two dorsal fins; body attenuated, naked, without scales; teeth in both jaws and in front of the vomer, small and sharp, none on the palatine bones; preoperculum, or

operculum, armed with spines; branchiostegous rays, six.

Examples.—The River Bull Head or Miller's Thumb (*Cottus Gobio*), a well-known inhabitant of our clear streams, especially those which have a stony bed. The Sea Scorpion, or Short-Spined Cottus (*Cottus Scorpius*); common around our coast, and in the northern seas generally. The Father-Lasher, or Long-Spined Cottus (*Cottus bubalis*); found in the seas of Greenland, and on the coasts of our island. The Four-Horned Cottus (*Cottus quadricornis*), a native of the Baltic and the northern seas; not unfrequent on our coasts.

We may here notice the Armed Bull-Head (*Cottus cataphractus*, Linn.), a native of the northern seas, as far as Greenland and Iceland. It is the *Aspidophorus Europæus* of Cuvier, who separated it from *Cottus*.

(Yarrell's *History of British Fishes*, vol. i.)

COTURNIX. [PERDICIDÆ.]

COTYLE'DON, is the seed-leaf of plants. The situation of the cotyledon is on one side of the axis of the embryo or young plant contained in the seed; the *plumule* is the apex of this axis, and the *radicle* the base. In the largest number of known seeds there are two cotyledons on opposite sides on the same plane; in a few there are several opposite to each other in a whorl; in a considerable number there is only one; and among the lower plants there appears universally to be an absence of the organ. These differences have given rise to the terms Dicotyledons, Polycotyledons, Monocotyledons, and Acotyledons. [EMBRYON.]

COTYLE'DON, a genus of plants belonging to the natural order *Crassulaceæ*. The species are succulent shrubs, mostly natives of the Cape of Good Hope. *C. Umbilicus*, Navelwort, has flowers of a greenish yellow colour, and is found on rocks or walls in the west of England. It is also a native of Portugal. *C. lutea* has been found wild in England, but is probably not a native.

Many of the species of this genus have been separated under the genus *Umbilicus*, the type of which is the first species named—which is called *U. erectus*. The species of Umbilicus closely resemble those of Cotyledon. The best situation for these plants is the shelves of a greenhouse.

COUCHING. [CATARACT.]

COUE'RON. [LOIRE-INFE'RIEURE.]

COUGH, a violent expulsion of air from the lungs, attended, when the act of coughing recurs in rapid succession, that is, when there is a fit of coughing, with correspondingly rapid inspirations. Cough is a violent and sonorous expiration, during the effort of which a much greater quantity of air is expelled from the lungs than is returned by the corresponding act of inspiration.

Cough is produced by the application of irritating substances or fluids, as cold air, to the mucous membrane which lines the air-passages. Inflammation and nervous derangement also produce the same effects.

The treatment of cough must of course be modified in every different case according to the causes on which it depends. If it be induced by cold congesting the air-passages, the remedies of catarrh [CATARRH] constitute the appropriate means of cure; if by inflammation of the lining membrane of the air-tubes, the remedies and the principles of their administration have been already described under BRONCHITIS. If it depend on diseases of the lung, the precise nature of the malady should be carefully and anxiously investigated; and the removal of the cough attempted only by the removal or prevention of the threatening or the actually existing disease. In like manner, if cough be induced by nervous irritation, by undue excitement in a nervous temperament, or by a disordered state of the stomach, liver, or bowels, it is absurd to attempt the removal of the cough in any other mode than by the cure of the disease of which it is the sign, and to the discrimination of which it should be the guide.

COULOMB, CHARLES AUGUSTIN DE, was born at Angoulême in 1736. He studied at Paris, and entered at an early age into the army. After serving with distinction for three years in the West Indies, he returned to Paris, where he became known by a treatise on the equilibrium of vaults (1776). In 1779 he was employed at Rochefort, where he wrote his 'Théorie des Machines Simples,' a treatise on the effects of friction and resistance, which gained the prize of the academy, and was subsequently printed separately in 1809. A project of navigable canals had been offered to the Etats of Bretagne, and Coulomb was appointed by the minister of marine to examine the ground. His report was unfavourable, which so displeased some influential persons that he was placed in confinement: the pretext was, that he had no order from the minister of war.

The Etats afterwards saw their error, and offered Coulomb a large recompense, but he would accept nothing but a seconds' watch, which afterwards served him in all his experiments. In 1784 he was Intendant des Eaux et Fontaines; in 1786 he obtained the reversion of the place of Conservateur des Plans et Reliefs, and was sent to England as a commissioner to obtain information on the hospitals. At the revolution he lost his public employments, and devoted himself to his domestic affairs. He was one of the first members of the Institute, and an inspector-general of public instruction. He died August 3, 1806, having supported a high moral and social character through life.

It may be said that Coulomb was the founder of the school of experimental physics in France; and his determinations relating to friction and resistances in general were the first which had been obtained by one who united in his person the qualities of an accurate experimenter and a competent mathematician. He ascertained the non-penetration of the electrical fluid into the interior of solid bodies: and, by means of the Torsion Balance, he discovered the law of electrical and magnetical attractions. This instrument, which is his most important invention [ELECTROMETER; TORSION], has been found to be of as much value in all delicate measurements of forces as the ordinary balance is in analytical chemistry.

(*Biographie Universelle.*)

COULOMMIERS. [SEINE-ET-MARNE.]

COULTERNEB. [AUK.]

COUMAROUNA ODORA'TA, also called *Dipterix odorata*, is the plant which yields the sweet-scented Tonga Bean of the perfumers. It is a native of French Guiana, where it forms a large forest tree, called by the natives Coumarou. The trunk is said to be 60 or 80 feet high, with a diameter of three feet and a half. The natives string the seeds into necklaces; and the Creoles place them among their linen, both for the sake of their scent and to keep away insects.

The genus belongs to the tribe *Cæsalpinia*, of the natural order *Fabaceæ*, or *Leguminosæ*.

COUNCIL OF THE CHURCH, an assembly of prelates, who meet, being duly convoked by the legitimate authority, for the purpose of defining questions of doctrine, or making regulations or canons in matters of discipline. There are various sorts of councils:—

1st, General or Œcumenic Councils, which are considered as a representative and legislative assembly of the whole church, and to which all bishops are summoned.

2nd, National Councils, consisting of the bishops of a whole kingdom or state, which can be convoked by the respective sovereigns; but the authority is not considered universal over the whole church.

3rd, Provincial Councils are convoked by the respective metropolitans, with the consent of the sovereign. A bishop may also convoke a diocesan council, with the consent of his superior.

The Church of Rome reckons several councils, though not œcumenic, previous to that of Nice; the earliest of which seems to be that held at Jerusalem about the year 50 of our æra, and which was attended by the apostles Peter, John, James, Paul, and Barnabas, and which is mentioned in the xvth chapter of the Acts of the Apostles.

SERIES OF GENERAL OR ŒCUMENIC COUNCILS.

Nice, the Council of, convoked by Constantine, A.D. 325, condemned Arius, framed the Confession of Faith, or Symbol of Nice, and fixed the time for the celebration of Easter in the western church.

Constantinople, First Council of, convoked by the Emperor Theodosius I., A.D. 382, confirmed the canons of the council of Nice, and established the dogma of the divinity of the Holy Ghost against the attacks of Macedonius.

Ephesus, Council of, convoked by Theodosius II., A.D. 431. It condemned Nestorius. [NESTORIANS.]

Calchedon, Council of, convoked by the Emperor Marcianus, A.D. 451. It condemned the spurious council of Ephesus of A.D. 449, which had approved the doctrine of Eutyches and of Dioscorus. [EUTYCHIANS.]

Constantinople, Second Council of, convoked by Justinian, A.D. 553, condemned the tenets of Origenes, as well as the doctrines known by the name of the 'three chapters.' [ORIGENES; VIGILIUS.]

Constantinople, Third Council of, A.D. 680, convoked by the Emperor Constantine Pogonatus, confirmed the canons of the five previous œcumenical councils, and condemned the tenets of the Monothelites, an offshoot of the Eutychians.

Nice, Second Council of, convoked by the Emperor Constantine, son of Irene, A.D. 787. It condemned the Iconoclasts, and sanctioned the worship of images in the churches. The authority of the above seven councils is acknowledged by the Greek as well as the Latin churches.

Constantinople, Fourth Council of, convoked by the Emperor Basilius, A.D. 859, condemned the schism of Photius. [PHOTIUS.]

Lateran, First Council of, styled the ninth Œcumenic, was convoked by Pope Calixtus II., in 1123, and consisted only of the Western or Latin bishops. It made several canons of discipline against simony, clerical concubinage, and the alienation of church property.

Lateran, Second General Council of, convoked by Innocent II., A.D. 1139, condemned the antipope, Anacletus, and his patron Roger, count of Sicily; condemned also the heresies of Peter of Bruis, and of Arnaldo of Brescia, and made several canons of discipline.

Lateran, Third Council of, convoked by Pope Alexander III. in 1179, after his reconciliation with the Emperor Frederic I., made many canons of discipline and morality, and in its last canon, after anathematising Cathari, Patarini, Albigenses, and those who afforded them protection, it stated that, although the church abhors the shedding of blood, it does not refuse the countenance and support of the temporal laws of Christian princes, because the fear of corporal punishment is sometime efficacious in producing spiritual reformation.

Lateran, Fourth Council of, convoked in 1213 by Pope Innocent III., met in November, 1215, and was attended by the Patriarchs of Constantinople and of Jerusalem, Constantinople being then in the hands of the Latins. It sanctioned seventy canons, or decrees, which had been framed by the pope, especially on matters of discipline, and its regulations are often quoted by canonists on questions of marriage, benefices, the election of bishops and abbots, &c., and enforced auricular confession, at least once a year, on all the faithful who have reached the age of discretion. The council likewise promulgated an exposition or profession of faith, in which the doctrine of transubstantiation was expressly included.

Lyon, First Council of, convoked A.D. 1245 by Pope Innocent IV. for the extirpation of heresy and schism, for the affording of assistance to the Christians of Palestine, and also to judge of the charges against the Emperor Frederic II., whom they deposed. The council also ordered a new crusade for the recovery of the Holy Land, and made provision for the funds required for the purpose.

Lyon, Second Council of, convoked in 1274 by Pope Gregory X. for the object of reforming the discipline and morals of the clergy, for the reunion of the Greek church, and for the assistance of the Christians of Palestine. The council made several excellent regulations concerning the election of bishops, and the appointment of parish incumbents, and the administration of church property.

Vienne (in Dauphiny), *Council of*, convoked by

Pope Clement V. in 1311, condemned the order of the Templars, and the pope suppressed the order and confiscated their property. [TEMPLARS.]

Constance, Council of, assembled in 1418, condemned Huss and his disciples, deposed Pope John XXIII. and two antipopes, and elected Martin V., who dissolved the council in 1418.

The next general council is that of *Basel*. The first session, or meeting, took place in December 1431, when Cardinal Julian opened the council by an eloquent speech, in which he exhibited the evils of the church resulting chiefly from the relaxation of its discipline, and stated the two great objects of the present council to be: one, the reunion of the Eastern and Western churches; and the other, an effectual reform of the church in general in all its members.

The second session of the council took place in February 1432. The council issued a decree declaring that it held its power immediately from Jesus Christ, the Head of the Church; and that every person, even the pope, was bound to obey its decisions in matters of faith, as well as for the extirpation of schism, and likewise for the reformation of the church. Meantime the pope (Eugenius) had issued his bull of dissolution. The fathers sent a synodal answer to the papal bull, in which they asserted that the pope, although the ministerial head of the church, was not exalted above the whole mystical body of the church, as that mystical body, even exclusively of the pope, cannot err in matters of faith, being under the inspiration of the Holy Ghost; whilst the pope might err, as experience showed.

In the third session (April 1432) the council summoned Eugenius to revoke the bull of dissolution, and to attend the council in person in three months' time, or to send persons with full powers to represent him. The dispute with Pope Eugenius continued during 29 sessions, until, in January 1438, one Cardinal Nicholas, Eugenius's legate, opened a new council at Ferrara. The Council of Basel was declared henceforth null, and all its future acts were declared void. Several theologians date from this epoch the termination of the legality of the Council of Basel. That assembly however went on holding its sessions for five years longer, and a schism in the church was the result. The Council of Basel deposed Eugenius in 1439, and elected Amadeus VIII. of Savoy, by the name of Felix V. These measures however were discountenanced by the great majority of the Catholic world. France, England, and Germany disapproved of them. Most of the bishops withdrew from Basel, and their places were filled up by archdeacons, friars, provosts, and doctors, and other churchmen not of episcopal rank. From that period it is impossible to consider the Council of Basel any longer as œcumenic. The last session of this self-styled Council of Basel was held in May 1443, when it decreed that within three years a council, or rather a continuation of the council, should be held at Lyon. It however met ultimately at Lausanne, in 1449, when, Felix having abdicated, the remaining fathers of the Council of Basel made their peace with Nicholas V.

Ferrara, Council of, was attended by Pope Eugenius, the Emperor John Manuel Palæologus, the Patriarch of Constantinople, Mark, archbishop of Ephesus, and about twenty more Eastern bishops. The discussions between them and the Latin prelates turned first upon the dogma of the proceeding of the Holy Ghost and the word 'filioque' said to have been added by the Latins.

In 1439 the council was transferred to *Florence*, and the discussions were continued. The two parties effected a reconciliation, excepting Mark of Ephesus, upon the dogma of the Holy Ghost, that of purgatory, and the supremacy of the pope, which the Greeks acknowledged, 'saving the privileges and rights of the patriarchs of the East.' The act of union was signed by the vicars of the patriarchs of Alexandria, Antioch, and Jerusalem, and by several metropolitans, but it was soon after disavowed by the great body of the Eastern church. [GREEK CHURCH.] The Eastern prelates, about thirty in number, left Florence in August 1439, to return to their country. After several other decrees the Council of Florence was closed in April 1442. The French and other divines do not recognise the authority of the Council of Florence, which however is fully acknowledged at Rome. The same may be said of the following:—

Lateran, the Fifth Council of, was convoked by Pope Julius II., in 1512, to oppose the acts of the pretended Council of Pisa, when a certain number of prelates hostile to Julius had assembled under the influence of the King of France, then at variance with the pope. The council continued assembled till March 1517. It chiefly concerned itself with matters of discipline. Among others, it established a general ecclesiastical censorship on all printed books, under pain of excommunication. It confirmed the concordat made at Bologna between Pope Leo and Francis I., concerning the sees and benefices of France, and annulled the previous pragmatic sanction promulgated by King Charles VII. The concordat took away from the chapters the right of electing to vacant sees, and gave the nomination to the king, subject to the papal sanction and ordination.

Trent, the Council of, is the last œcumenic council of the Latin church. It was convoked by Pope Paul III. in 1542, for the purpose of restoring peace to the church, distracted by the efforts of Luther and other reformers. It sat till 1563, and passed many canons for the government and discipline of the church, which were confirmed by the pope's bull in 1564. All the Roman Catholic states accepted the council, with the exception of France, which asserted the jurisdictional independence of its church and king.

The Greek or Eastern Church, since its separation from Rome, has held its own general councils or synods under the presidency of the œcumenic patriarchs of Constantinople. [GREEK CHURCH; RUSSIAN CHURCH.]

The Protestant and Reformed Churches have also held their councils or synods. The synod of *Dort* was held in 1618. It was attended by Protestant divines from Holland, England, Scotland, Hesse, Bremen, and the Palatinate; and the tenets of the Arminians relating to predestination

and grace were condemned by the assembly, which was chiefly composed of the followers of Calvin. The Synod of Embden, in 1571, and that of Sandomir for the Protestant churches of Poland, the synods of the Scottish church, and the convocations of the church of England, are also a sort of national councils; but the Protestants in general do not admit the divine inspiration and consequent infallibility of the councils, whether general or national, though they acknowledge the doctrines propounded by the first two œcumenic councils of Nice and Constantinople.

COUNCILLORS. [MUNICIPAL CORPORATIONS.]

COUNSEL, an abbreviation of counsellor. In England a counsellor is a barrister [BARRISTER], or one who has kept twelve terms at one of the four inns of court, and has been called to the bar. After keeping his terms a man may act as a conveyancer, special pleader, or equity draftsman, without being called to the bar, but he must take out a certificate under 9 Geo. IV. c. 49. The word counsel has no plural number, and is used to denote either one or more counsel. The duty of counsel is to give advice in questions of law, to draw instruments and pleadings, and to manage causes for clients. Some only practise in courts of common law, some only in courts of equity, and some, as conveyancers, only advise on questions of law, and draw up legal instruments. They are supposed to work for nothing, but in fact they are paid, though the pay is sometimes tardily made, and sometimes not at all. They ought to be paid beforehand, because they cannot maintain an action for their fees. The counsel is paid by the attorney or solicitor of the person whose business he does. Counsel may be retained generally, that is, to advocate any cause in which the retaining party may be engaged, or specially with reference to a pending cause; and generally speaking a counsel cannot refuse a retainer; there are certain rules however by which their practice is regulated.

Counsel may urge and argue upon any thing which is contained in their instructions, and is pertinent to the matter in question, and it is not their business to inquire whether it be true or false: they are also at liberty to make comments on the evidence adduced on that part of the case to which they are opposed, and to cross-examine the witnesses of the opposite party.

By 6 & 7 Wm. IV. c. 114, all persons tried for felony may make full answer and defence by counsel.

Counsel are punishable by Stat. West. 1. 3 Ed. I. c. 28, for deceit or collusion, and are so far under the jurisdiction of the judges, that in the event of malpractice they may be prohibited from addressing the court. There are also certain rules, established by each court for the regulation of its own practice, to which counsel are subject.

COUNT, through the French word *comte*, from the Latin *comes, comitis*, meaning companion. The word, though simply meaning companion, received various particular significations. Young Romans of family used to go out with the governor of a province and commander of armies, under whom they got an insight into public and military matters. They were called comites. Juvenal ('Sat.' viii. 127) speaks of the 'cohors comitum.' With the establishment of the imperial power at Rome, comites were established about the emperor's person. When the emperor sat as judge he had comites and jurisconsulti (jurists) with him. (Spartian, 'Hadrian.,' c. 18.) In the time of Constantine, comes became a title, and there were comites of the first and second class, and so forth. The term comes, as a title, was established both in the eastern and the western empire. Some of them were governors of provinces or particular districts. Under the first two races of the Frank kings, the counts were, as under the lower empire, officers of various degrees. The count of the palace was the first dignity in the state, after the maire of the palace. A count had the government of a small district, often limited to a town and its dependencies. He was at the same time a judge, a civil administrator, and a military commander. In case of war, he led in person the contingent of his county to the army. With the progress of time, the counts, as well as the other officers appointed to govern the provinces, the towns, and the frontiers, succeeded in rendering their places hereditary, and in making themselves sovereigns of the districts of which they had only been created removable and revocable administrators. The term count became in France a mere title, conferring no political power; but all titles in France have been abolished since the revolution of February 1848. In the papal states, as well as in those of Austria, it may be bought for a moderate sum; and in the other monarchical states of the continent it is granted as a mark of imperial or royal favour.

The title of *earl*, or, as it was often rendered in official Latin, *comes*, companion, is of very high antiquity in England, being well known to the Saxons under the name of *ealdorman*, that is to say, *elder-man*, and also *shireman*, because each of them had the government of a distinct *shire*, or, as it is now generally called, *county*. The sheriff, under his Latinised name, is called vice-comes, or viscount, which term is now one of the titles of rank in the British peerage. The term count seems not to have been used in England as a title of honour, though the wives of earls, from a very early period have been addressed by the title of countess. The king, in mentioning an earl in any writ or commission, usually styles him 'trusty and well-beloved cousin'—a peculiarity at least as ancient as the reign of Edward III.

COUNT. [PLEADING.]

COUNTER-APPROACH, a trench leading from the covered-way of a besieged fortress, at some point on either flank of the ground upon which the works of the besiegers are formed, and extending to any convenient distance towards the country: it is frequently terminated by a small redoubt or battery, from whence a fire of light artillery is directed into the trenches of the enemy.

If counter-approaches are intended for more than a momentary purpose, the parapets of the redoubts should be strong enough to resist the fire

of artillery, and those works should be secured against an attack at their gorges by lines of palisades.

COUNTER-FORTS, in military architecture, are buttresses of brick or stone built against the revetment walls, by which the outward pressure of the rampart, or of the natural ground on the opposite side of the ditch, is resisted. They are intended to increase the strength of such walls, and are formed between them and the earth which the walls retain. Their depth is usually equal to the mean thickness of the revetment, and they are placed at intervals of about 18 feet from each other, along the walls. They are sometimes connected together by counter-arches. [REVETMENT.]

COUNTER-GUARDS are outworks occasionally constructed on the exterior of the bastions or ravelins of a fortress in order to retard the formation of a breach in either of those works.

The counter-guard is in general merely a line of rampart surmounted by a parapet, and broken in direction so as to form two faces parallel to those of the work which it covers. Its breadth, in rear of the parapet, should not exceed about 18 feet, that, while there may be room for the defenders, the enemy may not have sufficient space for the establishment of a battery on its terreplein; and, consequently, that he may not be able to breach the bastion or ravelin, till, by mining or otherwise, he has destroyed the counter-guard.

What are called counter-guards in the second and third systems of Vauban are, properly, bastions detached from the line of rampart called the enceinte.

COUNTERMINE. [MINES, MILITARY.]

COUNTERPART. [DEED.]

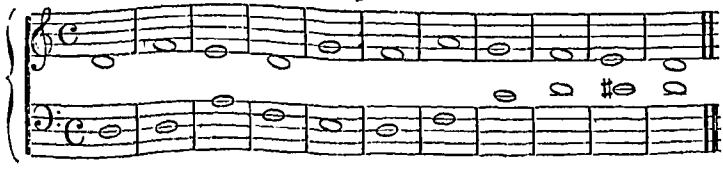
COUNTERPOINT, in music (*contrapunctum*), is a term now synonymous with *Harmony* [HARMONY], and nearly so with *Composition;* but the latter implies more of invention, of imagination, particularly as relates to melody, than counterpoint imports. Counterpoint in its literal and strict sense signifies *point against point.* In the infancy of harmony, musical notes or signs were simple points or dots, and in compositions in two or more parts were placed on staves, over or against each other. Subsequently the term was applied to the parts added to a given melody, such melody taking the name of *cantus-firmus, canto-fermo,* or plain-song. [PLAIN-SONG.]

Counterpoint is divided into Simple, Florid or Figurate, and Double. *Simple Counterpoint* is a composition in two or more parts, the notes of each part being equal in value to those of the corresponding part, or parts, and concords. *Florid or Figurate Counterpoint* is such, that two or more notes are written against each note of the subject, and discords are admissible. *Double Counterpoint* is an inversion of the parts, so that the base may become the subject, the subject the base, &c.

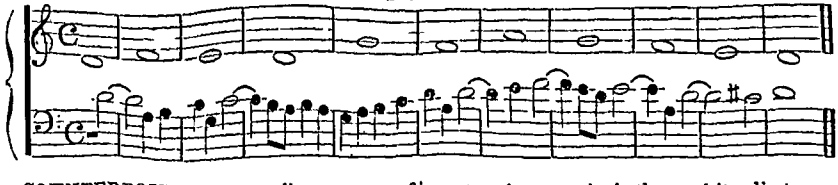
The following are two examples of *Simple* and Florid Counterpoint, taken from the 'Gradus ad Parnassum' of Johann *Joseph Fux*, who was Kapellmeister to the Emperor Charles VI. in the beginning of the last century.

Further details are given under [HARMONY].

Simple.



Florid.



COUNTERPOISE is, generally, a mass of brass or iron so disposed as to keep a part of some instrument or machine in equilibrio. Large astronomical instruments are generally mounted so that their centres of gravity are supported, in which case they require no counterpoise; but a reflecting circle is sometimes so placed as to require a heavy counterpoise on the other side of the pillar which sustains it. A transit instrument or mural circle, whose pivots would press heavily on their supports, is sometimes provided with counterpoises, one for each point which is to be relieved. Lord Rosse's great telescope has two counterpoises to assist in the requisite adjustments. A drawbridge usually has its weight relieved, or almost wholly removed, by a counterpoise, so that the machinery employed to raise it has little except the resistance arising from friction to overcome.

COUNTERSCARP is that side of the ditch about a fortress which is opposite to the ramparts. The part which is in front of the salient angle of a work is in the form (on the plan) of a circular arc having the vertex of that angle as a centre; and, if the ditch be that of an outwork, the direction of the counterscarp is generally parallel to the

rampart; the counterscarp of the main ditch is in the direction of a line which is a tangent drawn to the arc from the shoulder of the collateral bastion.

A deep ditch, having the earth retained on the side of the country by a nearly vertical wall, is generally considered indispensable for a fortress, because the descent of the enemy into the ditch is thereby rendered difficult. Carnot however recommends that the counterscarp side of the ditch should be formed in a gentle slope rising from the bottom to the level of the natural ground, in order that the garrison may with facility make those great sorties which he considers as one of the most powerful means of defence.

COUNTERVALLATION, a chain of redoubts executed about a fortress in order to prevent the sorties of the garrison: the works are generally unconnected with each other, but they have been sometimes united by a continuous line of parapet. It has happened, during the continuance of a siege or blockade, that the investing corps has been menaced by an army coming up to relieve the fortress; in which case, when it was intended to act on the defensive without abandoning the siege, a chain of redoubts was constructed to strengthen that corps on the exterior: this is called a circumvallation; and originally, like the interior chain, it entirely surrounded the fortress.

According to Thucydides, the town of Platæa, when besieged by the Lacedæmonians, was surrounded by a line of palisades to prevent the egress of the garrison; and subsequently a circumvallation was added. At the siege of Alesia, the countervallation executed by Cæsar consisted of a rampart of earth, 12 feet high, which was surmounted by a parapet, probably of stakes, and by turrets, at the distance of 80 feet from each other. A triple ditch was formed between this line and the town. The Roman army was encamped beyond the line, and inclosed by a circumvallation of similar form; the latter was 14 miles in circumference.

The long duration of ancient sieges rendered such works indispensable; but, the use of artillery having greatly abridged the time to which the defence of a fortified place can be extended, they have become of less importance; and, in fact, it is only when the garrison is strong, and the quarters of the besieging army are separated by the obstacles of the ground, that any works are considered necessary: in this case, instead of continuous lines of palisades and high towers of wood, a few simple redoubts and breast-works of earth are constructed at intervals. In general the besiegers are protected by an army of observation in the field when any effort on the part of the enemy to raise the siege is apprehended.

COUNTY. [SHIRE.]

COUNTY-COURTS. [DEBTS, SMALL.]

COUNTY RATE. County rates are taxes levied for the purpose of defraying the expenses to which counties are liable. They are levied either under the authority of acts of parliament, or on the principle that, as duties are imposed upon a county, there must be a power to raise the money for the costs incurred in executing them.

The ancient purposes of the county rate were, 'to provide for the maintenance of the county courts, for the expenses incidental to the county police, and the civil and military government of the county; for the payment of common judicial fines; for the maintenance of places of defence (sometimes however provided by a separate tax common to counties and to other districts, called *burgbote*), prisons, gaols, bridges (when these were not provided for by a separate tax common to counties and to other districts called *brukbote*), and occasionally high roads, rivers, and watercourses, and for the payment of the wages of the knights of the shire. Additions to these purposes, some occasional and some permanent, were made from time to time by statutes. The king's aids, taxes, and subsidies, were usually first imposed on the county, and collected as if they had been county taxes. But the first statute defining any of its present purposes (though now repealed as to the mode it prescribes for imposing the tax) was passed in the 22nd Hen. VIII. From that time up to the present new purposes have constantly been added, and new and distinct rates were constantly created for purposes of comparatively little importance, and to raise sums of money quite insignificant in amount.' ('Report on Local Taxation,' by the Poor Law Commissioners.)

By the 12 Geo. II. c. 29, justices of the peace at general or quarter sessions were enabled to make a general rate to answer the purpose of the distinct rates previously leviable under various acts of parliament for the purposes of bridges, gaols, prisons, and houses of correction, such rate to be assessed upon every town, parish, and place within the county, to be collected by the churchwardens and overseers, along with the poor-rates of every parish, and paid over to the high constables of hundreds, by them to treasurers appointed by the justices, and again by them to whomsoever the justices should direct. The county rate for lunatic asylums is however, by statute, a special rate, and so is likewise the county rate for shire-halls, assize-courts, session-houses, judges' lodgings, &c.; but the provisions of the statutes under which these rates are levied are disregarded, and the justices pay the expenses out of the general county rate. This is the case also with the rate for the county and district police force, where such force is established, though it is directed to be a special rate.

By the 55 Geo. III. c. 51, the justices of counties at quarter sessions were empowered to make a fair and equal county rate when circumstances required, for all the purposes to which the county stock or rate was then or should thereafter be made liable by law, extending to all parts of the county except liberties or franchises having a separate coextensive jurisdiction. The act contained numerous provisions giving powers for enforcing payment of the rate; for ascertaining the value of property for the purpose of assessment; for regulating the right of appeal given by the former act; extending the provisions of the former act to that act; enabling counties where the rates had been regulated by local acts to make use of that act; extending the provisions of the act to places having commissions of the peace within themselves, &c.

By the 56 Geo. III. c. 49, extra-parochial and other places, though not rateable to the relief of the poor, were made subject to county rates, and certain powers were given for the ascertainments of boundaries between counties, ridings, &c., and other places of separate jurisdiction, for the purpose of assessing and levying county rates.

By the 57 Geo. III. c. 94, the provisions contained in the 56 Geo. III. c. 49, as to appeals, were repealed, and other regulations established in that respect; and it was provided that, where there were no high constables, the constables of the parish or place might levy the rates on the warrant of the justices.

By 58 Geo. III. c. 70, all such parts of former statutes, as provided that rewards should be paid out of the public revenue to prosecutors upon conviction for various crimes, were repealed, and it was enacted that in future the county rates were to be charged with such allowances to prosecutors. By subsequent statutes the costs in the prosecution of certain misdemeanours are paid out of the county rates. By 7 Geo. IV. c. 64, the principle of compensation to witnesses and prosecutors at the expense of the county was carried into effect more extensively. In 1836 however the government determined that one-half of the expense of prosecutions and the conveyance of prisoners should be defrayed out of the public revenue.

By the 1 Geo. IV. c. 85, the powers of former acts were extended to places where there were no separate church-wardens, and where no separate or distinct poor-rate has been made for any place extending into two or more counties, ridings, or other divisions; justices were empowered to appoint persons to tax and assess the county rate in extra-parochial places where no poor-rate exists, and certain regulations were made as to distress for rates.

By the 4 & 5 Wm. IV. c. 48, all business relating to the assessment and application of county rate is to be transacted in open court held upon due notice.

By the 5 & 6 Wm. IV. c. 76, s. 112, after a grant of a separate court of quarter-sessions has been made to any borough, the justices of the county in which such borough is situate are not to assess any property therein to any county rate thereafter to be made, but (s. 113) such boroughs are to bear the expenses of prosecutions at the assizes.

By 7 & 8 Vict. c. 33, high constables are relieved from the duty of collecting the county rate and paying it to the county treasurer, and these functions are to be undertaken by the Boards of Guardians.

In Burn's 'Justice of Peace,' 29th edit., 'County Rate,' the different purposes for which county rates may be levied are enumerated.

The expenditure of county rates in England and Wales in 1792 was 313,805*l.*; in 1832 it was 783,441*l.*.

The expenditure in the following years was as under :—

	£.		£.
1835 .	705,711	1837 .	604,203
1836 .	699,845	1838 .	681,842
1839 .	741,407	1842 .	1,230,718
1840 .	855,552	1843 .	1,295,615
1841 .	1,026,035		

In the last three years the county police expenditure, which in 1843 amounted to 243,738*l.*, is included.

From 1830 to 1838 the proportion of five heads of expenditure was 69 per cent. of the total expenditure :—Bridges, 9.3 per cent.; Gaols, 9.7; Prisoners' Maintenance, 25.8; Prosecutions, 19.9; Constables and Vagrants, 4.3 per cent.

The county rate is levied on the same description of property as the poor-rate, that is, on lands, houses, tithes impropriate, propriations of tithes, coal-mines, and saleable underwoods: the term 'lands' includes improvements of lands, by roads, bridges, docks, canals, and other works and erections not included under the term 'houses.' The county rate is to be assessed upon parishes 'rateably and equally according to the full and fair annual value of the messuages, lands, tenements, and hereditaments liable, or which might be liable, to be rated to the relief of the poor.' The sum assessed in 1833 was about 8¾ per cent. (or rather more than one-twelfth) of the levy for the poor, out of which fund it is paid, and in 1843 the proportion was between one-sixth and one-seventh. About five-eighths of the assessment is paid by land, and three-eighths by houses, mills, manors, canals, &c.

The Act 55 Geo. III. c. 51, has not corrected unfair valuations, as the overseers on whom the revaluation depends have an interest as owners or occupiers in a low rateable value. There is no general principle of rating through England and Wales; and all the various practices as to rating are alike complained of as unequal in the counties in which they are adopted. ('Report on Local Taxation.')

The proportion in the pound of the county rate valuation for England and Wales, and for several of the counties, is as follows :—

England, 3¼*d.*; Wales, 3½*d.*; Northumberland, 1½*d.*; Bedford, 12½*d.*; Westmoreland, 2½*d.*; Middlesex, 3½*d.*; Lancaster, 1½*d.*; Anglesey, 24*d.*; Pembroke, 1*d.*

COUPLING, in machinery, is the name given to various arrangements by which the parts of a machine may be connected or disconnected at pleasure, or by which a machine may be disengaged from, or re-engaged with, a revolving wheel or shaft, through which it receives motion from a steam-engine, water-wheel, or other prime mover. Coupling-boxes, clutches, or glands, a solid conical wheel working in a hollow cone, friction-wheels whose peripheries act in contact, and Hook's universal joint, are different forms of apparatus for effecting this adjustment.

COUR ROYALE. [Department.]

COURANTE, or CORANTO, a quick dance in triple time. In Handel's, Mattheson's, and other 'Lessons' for the harpsichord, composed towards the beginning of the 18th century, a *Courante* is generally introduced as one of the movements.

COURBEVOIX. [Seine.]

COURCELLES. [Hainault.]

COURIER (from the French *courir*, to run), a messenger sent in haste or express, a bearer of

despatches. The advantage of receiving the earliest intelligence, and of conveying orders with celerity, must have given rise to the employment of couriers at a very early period. Herodotus (viii. 98) gives a particular description of the speed of the Persian royal messengers, who proceeded by relays. The mode of employing couriers by Cyrus, as described by Xenophon, ('Cyri Instit.' viii. 6), appears to be nothing more than the system already referred to as described by Herodotus. The Romans called such messengers *cursores:* they were sometimes sent on foot and sometimes on horseback. The earliest couriers of the European nations were probably what have since been called running-footmen.

COURIER, PAUL LOUIS, was born in 1774. His father was a substantial farmer, who gave him a good education. He served in the French army in the campaign of Rome in 1798–9. On his return to France after the first peace, Courier published several translations from the Greek, such as Isocrates' Eulogy of Helena, Xenophon's treatise on the Command of Cavalry and on Equitation, and remarks upon Schweighäuser's edition of Athenæus. He also began a translation of Herodotus.

In 1806 he again served in Italy with the army that invaded the kingdom of Naples. His letters from Naples, Calabria, and Puglia, 1806–7, give some valuable information concerning those times and events. Courier served with the rank of chef d'escadron in the Austrian campaign of 1809. After the battle of Wagram he gave in his resignation, which was readily accepted; for his inquisitive turn of mind and independent temper made him looked upon as a troublesome person by the more thorough-going officers of Napoleon. Retiring to his farm at Veretz, in the department of Indre et Loire, he heard with no regret the fall of Napoleon, and expressed himself as satisfied with the charter given by Louis XVIII. if conscientiously fulfilled. He however began soon to find matter for his satirical vein. His 'Livret,' or Memorandum-book, and his letters, give a curious picture of provincial politics, and of the state of society in the interior of France after the restoration. His letters, several of which were published at the time in the 'Censeur,' have been compared for their power and humour to Pascal's celebrated Provinciales. When, in 1821, a subscription was opened all over France to purchase the estate of Chambord for the infant Duke of Bordeaux, he wrote 'Simple Discours aux Membres de la Commune de Veretz,' for which he was tried, and condemned to one month's imprisonment. He published an account of his trial, under the title of 'Procès de Paul Louis Courier, vigneron.' Courier was now looked upon as one of the most formidable antagonists of the Bourbonist party. At the beginning of 1825 he was found murdered near his house at Veretz, but no clue was discovered to the perpetrators of the crime. His works have been collected, and published in four volumes 8vo., Brussels, 1828. The fourth volume contains his unedited letters.

COURLAND, a province of Russia in Europe, which until 1795 belonged to Poland, is bounded N. and N.E. by the Gulf of Riga; W. by the Baltic; S. by Wilna and Prussia; S.E. and E. by Minsk, Vitepsk, and Livonia. Its area is 10,535 square miles, and the population is 553,300, among whom are many Jews. The surface towards the sea-coast is level, and presents a sandy plain about Mitau and Goldingen, but its general character is undulating. It is intersected by two ranges of heights, one of which runs parallel with the Düna, or Dwina, while the other takes a more westerly direction, and spreads its arms out in various directions. The coast is partly flat, and partly lined with sand-hills. The most northerly point is the dangerous promontory of Domes-Nü, which stretches out between the Baltic and the Gulf of Riga. Directly E. of this promontory lies the Isle of Rouno, on which there is a lighthouse, in 57° 48′ N. lat., 23° 14′ E. long. A large portion of the soil is covered with forest-land, moors, lakes, ponds, and rivers.

The principal river is the Düna, which forms the eastern boundary, and is navigable. The Aa, or Treider-aa, formed by the junction of the Micha, the Eskau, and a great number of other streams, runs N.W. past Baousk, Mitau, and Chok, where it turns E., and, entering Livonia, falls into the Gulf of Riga, by the mouth of the Düna. The Windau, entering the province from Wilna, takes a northerly course, forms a fine cataract near Goldingen, and falls into the Baltic at the town of Windau. The central part of the province is drained by the Abau, which enters the Windau from the right, a little below Goldingen.

The soil of Courland is in general light and sandy; it is most productive on the side towards Livonia. In the moors and morasses blocks of granite are occasionally found imbedded. Agriculture is the principal occupation of the inhabitants, who raise large quantities of rye, barley, oats, wheat of the best quality, hemp, flax, linseed, peas, and beans. These articles, together with wool of the finest quality, hides, tallow, and timber, are the principal exports, and are shipped chiefly from Riga. A little tobacco is raised, and some fruit is produced; but the ordinary sorts of vegetables are grown every where. Horses, horned cattle, and sheep are numerous. The fisheries along the coast are not very productive. The supply of game is abundant. The extensive forests are in general situated on marshy ground, and consist principally of pines, firs, beeches, oaks, and elms. Of minerals, Courland contains small quantities of bog-iron, lime, and gypsum. It has also coals and marble, but they have not hitherto been turned to much account. Amber is thrown up on the coast. The only manufacturing establishments worth mentioning are spirit distilleries.

The capital of the province is Mitau, or Mittau, which stands in a marshy district, on the left bank of the Aa, in 56° 39′ N. lat., 23° 43′ E. long., and has 13,000 inhabitants. It is a well-built place, surrounded by walls, which inclose large gardens also. The streets are badly paved. The town contains nine churches, belonging to different sects of Christians; a synagogue, gymnasium, observatory, two public libraries; and has manufactures of linen, leather, and soap.

Libau, on the western coast, is the principal shipping port of the province. The harbour, formed by a salt lagoon, has a bar across the entrance, but admits vessels of 12 feet draught at all times; larger vessels are loaded or unloaded one or two miles from the town by lighters. The imports are chiefly salt, coals, mill-stones, machinery, herrings, sugar, and other colonial produce; the exports consist of flax, hemp, corn, calf-skins, salt meat, hides, bristles, bones, timber, tallow, deals, &c. In 1842 there arrived 223 vessels, with cargoes amounting to 10,402 tons, and worth 27,484*l.*; in the same year the departures were 225 vessels, with 10,782 tons, worth 184,914*l.* Ship-building and manufactures of various kinds are actively carried on. The population of Libau is 6500.

Windau stands at the mouth of the river Windau, down which a great deal of timber, the most important article of export, is floated. In 1842, 106 vessels arrived, with cargoes however only worth 4080*l.*; while the departures, numbering 105, carried away cargoes to the value of 45,186*l.* The population of Windau is over 2000.

The other towns are Goldingen, population, 2624; Toukourn, population, 3000; Iakobstat on the Düna, population, 1600.

COURS. [RHÔNE.]

COURT-BARON. [MANOR.]

COURT, CUSTOMARY [COPYHOLD.]

COURT-MARTIAL, a tribunal occasionally instituted for the purpose of trying military and naval men for the commission of offences affecting discipline in either of those branches of the public service.

Courts for the trial of causes connected with military discipline were regularly held, in the time of Henry VIII., by the Marshal of England; and, in the reigns of Elizabeth and her successor, those courts of war, as they were called, were superintended by a president chosen for the purpose. This president was probably a general or field-officer, but captains of companies were allowed to sit as members. But courts-martial in their present form were instituted in the reign of James II.; and in the ordinances of war published in 1686 they are distinguished as general or regimental. Subsequently to the revolution, their powers have been expressly regulated by parliament, and are fully detailed in what is called the Mutiny Act. Naval courts-martial are regulated by the Statute 22 Geo. II. c. 33.

General courts-martial are assembled under the authority of the sovereign, or of an officer having the chief command within any part of the British dominions to whom such authority may be delegated. Regimental courts-martial are held by the appointment of the commanding officer of the regiment. The East India Company's Mutiny Act empowers the governors in council at the three presidencies, and at St. Helena, to appoint general courts-martial, or to authorise any military man not below the rank of a field-officer to do so. What are called detachment courts-martial may be either general or regimental, and their appellation is derived from the nature of the command with which the officer convening the court is invested.

The chief crimes of which a general court-martial takes cognisance are—mutiny, abandonment of a fortress, post, or guard committed to the charge of an officer or soldier, disobedience of orders, and desertion; and these crimes, if proved to their greatest extent, are punishable with death. The practice of sending challenges between commissioned officers is punished with cashiering; between non-commissioned officers and privates, with corporal punishment: and, in all cases, seconds and accessories are held to be equally guilty with the principals. Self-mutilation, theft, making false returns of stores, and neglect of ordinary duty, in non-commissioned officers and privates, are usually punished by the infliction of a certain number of lashes; and men of the former class may, in addition to other punishments, be suspended, or degraded to the ranks.

The provisions of the Mutiny Act affect not only the cavalry and infantry of the regular army, but extend to the officers and privates in the corps of artillery, engineers, and marines; to all troops in the employment of the East India Company, or serving in the colonies; to the militia during the time that it is assembled and being trained; and, lastly, to the yeomanry and volunteer corps. All are subject, without distinction, to trial and punishment by courts-martial.

The rules of the service require that the president of every general court-martial should be a field-officer, if one of that rank can be obtained; but in no case must he be inferior in rank to a captain. And it should be observed, that none of the members are to be subalterns when a field-officer is to be tried. A judge-advocate is appointed to conduct the prosecution in the name of the sovereign, and act as the recorder of the court.

No general courts-martial held in Great Britain or Ireland are to consist of less than thirteen or nine commissioned officers, as the case may require; but in Africa and in New South Wales the number may be not less than five; and, in all other places beyond sea, not less than seven. No officer serving in the militia can sit in any court-martial upon the trial of an officer or soldier in the regular army; and no officer in the regulars is allowed to sit in a court-martial on the trial of an officer or private serving in the militia. Likewise, when marines or persons in the employment of the East India Company are tried, the court must be composed of members consisting in part of officers taken from the particular service to which the offender belongs.

In the accusation the crime or offence must be clearly expressed, and the acts of guilt directly charged against the accused; the time and place must be set forth with all possible accuracy; and, at a general court-martial, a copy of the charge must be furnished by the judge-advocate to the accused, that he may have full opportunity of preparing his defence. The accused has the power of challenging any of the members; but the reason of the challenge must be given, and this

must be well founded, otherwise it would not be admitted.

The court must discuss every charge brought against the accused, throwing out only such as are irrelevant; and judgment must be given either upon each article separately, or the decision of the court upon all may be included in one verdict. Witnesses are examined upon oath, and the evidence is taken down in writing, so that every member of the court may have the power occasionally of comparing the proceedings with his own private notes. At the last stage of the trial the decisions of the several members are taken in succession, beginning with the junior officer on the court.

Regimental or garrison courts-martial are appointed by the commanding officer for the purpose of inquiring into criminal matters of the inferior degrees; and they are empowered to inflict corporal punishments to a certain extent only. The articles of war require that not less than five officers should constitute a court of this nature, or three when five cannot be obtained. The practice is to appoint a captain as president, and four or two subalterns, as the case may be: the court has no judge-advocate to direct it; therefore the members must act on their own responsibility. The proceedings are to be taken down in writing, and the sentence cannot be put in execution till it has been confirmed by the commanding officer, or by the governor of the garrison.

No commissioned officer is amenable to a regimental court-martial; but, if an inferior officer or private should think himself wronged by such officer, he may, on application to the commanding officer of the regiment, have his cause brought before a regimental court-martial, at which, if the complaint is judged to be well founded, he may on that authority require a general court-martial to be held.

An appeal may be made from the sentence of a court-martial by the party who conceives that he has suffered injustice: the appeal lies from a regimental to a general court-martial; and from this to the supreme courts of law in the kingdom.

After the sentence of the court-martial has been pronounced, it is transmitted to the sovereign, who may either confirm it, or, if sufficient reason should exist, may, on the ground that the process is not complete till the royal sanction has been given to the judgment, return it to the court for revision, or again, by virtue of the royal prerogative, remit the punishment awarded.

(Grose, *Military Antiquities;* Tytler, *Essay on Military Law;* Samuel, *Historical Account of the British Army;* Simmons, *On the Practice of Courts-Martial,* with *Supplement.*)

COURT OF RECORD. [COURTS.]

COURT-ROLLS. [COPYHOLD.]

COURTESY OF ENGLAND is the title of a husband to enjoy for life, after his wife's decease, lands of the wife of which she and the husband were seised in the wife's right, for an estate of inheritance, and to which issue of the marriage is born which by possibility may inherit.

By the custom of Gavelkind, a man may be tenant by the courtesy without having had issue by his wife; but he has only half of the lands, and he loses them if he marries again. There is no tenancy by the courtesy of copyhold lands except by special custom, and the customs are various.

COURTESY OF SCOTLAND, otherwise called in the law of that kingdom 'jus curialitatis,' or right of courtship, is substantially the same with the courtesy of England. Five things are necessary to it; namely, marriage, that the wife is an heiress and infeft, issue, and the death of the wife.

As to the fourth requisite, inheritable issue born alive of the marriage, the child born must be the heir of the mother's estate, and it must have been heard to cry; for, though it be otherwise in England, crying is in Scotland the only legal evidence of life.

COURTOIS, JACQUES, commonly called Le Bourguignon, was born near Besançon, in Franche-Comté, in 1621. His father was a painter, and instructed him in his art. While yet a youth, he entered the French service, and followed the army for three years, drawing from the life all the most striking incidents and scenes of the camp, the march, and the battle-field, by which means he learned to portray such subjects with extreme boldness and truth. He afterwards visited Guido and Albani at Bologna, and Pietro da Cortona, M. A. Cerquozzi, and others, at Rome.

After spending some years in the execution of various works in Florence and in Venice, he returned to Rome, and entered as a lay brother into the order of the Jesuits. His pictures are not uncommon; there are several in most of the principal galleries of Europe, and they never fail to attract notice, by their surprising spirit of conception and execution; in colouring also they are warm and characteristic. He died of apoplexy, at Rome, in 1676.

COURTOIS, GUILLAUME, born in 1628, was the brother of Jacques. He was the pupil of Pietro da Cortona, and the friend of Carlo Maratta, and lived chiefly at Rome, where he died, in 1679. His subjects are chiefly from sacred history, painted in Roman churches. His style was correct, and perfectly free from manner. Several of his works have been engraved, and he etched a few plates himself.

COURTRAI, in Flemish *Kortryk*, a fortified town in West Flanders, stands in 50° 49′ N. lat., 3° 18′ E. long., and has 19,000 inhabitants. It occupies both banks of the Lys, by means of which and the canals connected with it the town has communication with the principal towns of Belgium. It is connected by railway also with Lille, Bruges, and Ghent, from which towns it is distant 15, 36, and 24 miles respectively. A chapel erected outside the town, near the Porte de Ghent, marks the centre of the field of the 'Battle of Spurs,' in which the weavers of Ghent and Bruges defeated the French in 1302. The streets are wide and clean, and the houses well built. The principal buildings are—the town-hall, a fine Gothic structure; the church of St.-Martin; and the church of Notre-Dame, which was built by Baldwin, count of Flanders, in 1238, and contains

the 'Exaltation of the Cross,' by Vandyke. Courtray contains an exchange, a college, and two asylums for orphans. The town is famous for the manufacture of damask and other linen textures, which are exported to all parts of Europe. Flax of the finest quality is produced in large quantities in the vicinity, which contains a great number of bleaching establishments. The dyers of Courtray imitate with success the colour known as Turkey red. Thread and silk lace are among the branches of industry pursued. (Van der Maelen's *Dictionnaire Géographique;* Murray's *Hand-book for North Germany.*)

COURTS. The word court has come from the French *cour*, which is from the Latin *curia*, a term used among the Romans to express among other things the Roman Senate. The French word cour is defined to be 'a part of the house which is not built upon, and is immediately behind the carriage entrance or other entrance, and in the better sort of houses is paved.' (Richelet, 'Dictionnaire.') It also signifies the residence of a prince (aula); the government of a country, as la Cour de la France; the judges of a court, or the court itself, as la Cour de Parlement. These various significations occur in the English language: we speak of the court of a house, of the king's court, of the high court of parliament, and of the courts of law and equity. In its judicial sense a court is the judge or judges, whether the judge or judges be required to sit in a particular place, or whether they may sit where they please: the court is composed of those who declare the law, and of such other functionaries, if any, as are appointed to record its proceedings.

Courts are of various kinds, according to the various constitutional systems of different countries. Some may have limited jurisdiction both as to place and as to the kind of matters which they can hear and determine. Some have no limit to their jurisdiction, except the limits that the government itself has, namely its territory. From those courts that have a limited jurisdiction there may be an appeal to those courts which have not a limited jurisdiction; and accordingly some courts may be called inferior, and others superior; or other terms may be used to express this relation.

In England the superior courts are the Court of King's (Queen's) Bench, Exchequer, and Common Pleas. The law which is called equity is administered in the Court of Chancery. There are also Ecclesiastical Courts, a Court of Admiralty, and numerous other courts, which are described under their several heads.

In England there is a distinction between courts of record and courts not of record: courts of record are the king's courts of common law, and have power to fine and imprison, which is not the case with courts not of record. From the judgment of a court of record there lies an appeal to the superior courts by writ of error: in courts not of record this is effected by a writ of false judgment. The county court, court baron, and hundred court, are courts not of record. The other courts of common law which we have mentioned are courts of record.

From each of the three superior courts of common law there lies an appeal by writ of error to the Court of Exchequer Chamber; and a further appeal lies by writ of error to the House of Lords, which is the supreme Court of Appeal.

COURTS, ECCLESIASTICAL. [ECCLESIASTICAL COURTS.]

COUSERANS, a mountainous district of the French province of Gascogne, situated on the northern slopes of the Pyrenees, and now included in the department of ARIÈGE. St.-Lizier was its capital.

COUSIN, JEAN, a French painter, sculptor, and geometrician, contemporary with Il Rosso and Primaticcio in the 16th century. Neither the date of his birth nor death is known; but he was born at Soucy, near Sens. His most celebrated picture is the 'Last Judgment,' painted for the Minims of Vincennes, and now in the Louvre. Many of the old painted windows of the churches of Sens and Paris, and elsewhere, were from the designs of Cousin. He was also a writer of ability; he wrote on geometry and perspective, and a small work on the proportions of the human body, with illustrative wood-cuts, which went through many editions. In sculpture, his principal work is the monument of Admiral Chabot, in the church of the Celestines.

COUSTOU, the name of two French sculptors, brothers, of Lyon.

Nicolas Coustou was born in 1658, and became the pupil of his uncle, Antoine Coysevox, a distinguished sculptor in Paris. When only twenty-three years of age, he obtained the grand Academy prize in sculpture, and went in consequence as a pensioner to Rome. His first great work in Paris was the colossal group representing the junction of the Seine and Marne, now in the garden of the Tuileries. But his work of highest pretensions is the 'Descent from the Cross,' in the choir of the cathedral of Notre Dame, generally called 'le Vœu de Louis XIII.;' the figures of Louis XIII. and Louis XIV., which were on each side of it, until 1831, when they were destroyed, were by Guillaume Coustou and Coysevox respectively. He died in 1733, having been forty years a member of the French Academy.

Guillaume Coustou was born in 1678, and was also the pupil of his uncle Coysevox. He went likewise to Rome, where he was forced to earn his own maintenance, for which he was chiefly indebted to Le Gros, who employed him on his bas-relief of St. Louis of Gonzaga.

After his return to Paris he executed many excellent works, several of which were for the gardens of Marly, but are now at the Tuileries; others are at Versailles: the two celebrated grooms checking restive horses, somewhat in the action of the ancient groups of Monte Cavallo, now at the entrance of the Champs Elysées, were at Marly until 1794. Still more celebrated works are the statues of the façade of the Château d'Eau, opposite the Palais Royal; and the more extensive bas-reliefs of the principal entrance of the Hôtel des Invalides. He died in 1746, director of the Royal Academy of Painting and Sculpture.

Guillaume Coustou the Younger, likewise a

distinguished artist, was the son of the elder Guillaume. He was born at Paris in 1716, obtained also the grand prize of the Academy in sculpture, studied five years in Rome, and died treasurer of the Academy in 1771. He designed the sculptures of the front of the church of St. Geneviève, which were removed when that building was converted into the Pantheon.

COUTANCES. [MANCHE.]

COUTRAS. [GIRONDE.]

COUZERANITE occurs crystallised. Primary form an oblique rhombic prism. Colour usually perfectly black, sometimes indigo-blue, rarely light gray. Hardness about 6.5. Specific gravity, 2.69. Found in the valleys of the Seix, which border upon Saint Girons. Silica, 52.37; alumina, 24.02; lime, 11.85; magnesia, 1.04; potash, 5.52; soda, 3.96.

COVE. [CORK.]

COVENANT is a written agreement under seal, between two or more persons, whereby some act is agreed to be done or not to be done; or, upon the happening of some event, some charge or liability is agreed to be borne by some party thereto. The person who subjects himself to a penalty, or to an action for breach of his agreement, is called the covenantor, and the person with whom it is made the covenantee. The doctrine of covenants belongs to the general subject of contracts; but in the English system, covenants, being agreements in a peculiar form, require a separate consideration.

Covenants take many varieties of forms. They usually arise from the express words of the parties; but any words denoting the intention are sufficient, as 'I agree.' They are sometimes inferred from the relation of the parties or from the nature of their agreement. Thus a demise for a term of years will sustain, upon an implied covenant, an action for quiet enjoyment.

If there are several covenantors, the writing usually declares the covenant to be several, or joint, or joint and several. If the covenant is several, each of the covenantors covenants for himself alone, and may be sued alone; if joint, each of the covenantors covenants for himself as well as for each other, and all must be sued together; if joint and several, each party covenants for himself, and as a surety for those with him, and an action may be brought against one of the covenantors only, or against all. The courts however, even in these cases, regard the interests of the parties; and if the interest, or cause of action, is joint, the action must be brought against all the covenantors, though the terms of their covenant may be joint and several; and if the interest, or cause of action, is several, though the covenant is joint, the parties must be severally sued. The mere terms of a covenant are not therefore a sufficient guide to determine the propriety of joining parties in an action upon it.

Covenants are divided into real and personal, though, as now used, they are, as to remedy, chiefly personal.

Real covenants are those which have an interest in land for their object, and may bind the real estate of the covenantor in the hands of the heir and of his assigns. Personal covenants bind only the covenantor, or his executors and administrators, that is, his personal estate in their hands. The objects of real covenants are generally to afford some specific advantage or protection to those into whose hands the realty to which they relate shall pass, or to secure the performance of some specific duty by those who may possess the realty to which they relate.

In the construction of covenants the intention of the parties is the thing to be ascertained: and, when this intention is clear, a long form of words is a useless superfluity, and ought to be got rid of. In the statutes relating to the registry of deeds in Yorkshire, it is declared that the words 'grant, bargain, and sell,' are to operate as covenants for title, for farther assurance, and for quiet enjoyment.

But the intention of the parties is not always sufficient. It is frequently desirable, when land is sold, that the purchaser and his assignees should always be able to resort to the vendor or to his heirs for protection, or that the purchaser and his assignees should perform certain duties, and that the covenants for these purposes should always be connected with the party enjoying the land, or, in other words, that such covenants shall 'run with the land.' In order that this shall occur, the mere intention of the parties, however definitely expressed, is insufficient; there must also be what is called privity of estate. The Real Property Commissioners have stated three rules respecting covenants running with the land.

1. A covenant to run with the land, so as to bind the assignee, or to give to him the benefit of it without his being named, must relate directly to the land, or to a thing parcel of the demise: such is a covenant to pay rent, or to keep buildings in repair. 2. When it respects a thing not in existence, but which, when it comes into existence, will be annexed to the land, the covenant will bind the assigns by naming them, but will not bind them unless named: such is a covenant to erect buildings, or to plant trees. 3. When it respects a thing not annexed, nor to be annexed, to the land, or a thing merely collateral, or in its nature merely personal, the covenant will not run, that is, it will not bind the assignee, nor pass to him, even though named: such as a covenant to haul coals to the lessor's house, or to grind corn at his mill. These rules, though originally laid down with reference to leases, have been treated as applying to cases not involving the relation of landlord and tenant.

The Law Commissioners also divide covenants where the relation of landlord and tenant, or lessee and reversioner, does not exist, into three classes. 1. Covenants made *with* the owner of the land to which they relate; as covenants for title, to indemnify from existing charges, for farther assurance, &c., which supply the old remedy of warranty, with the difference, that pecuniary damages, instead of the recompense of land, are obtained under them. 2. Covenants made by the owner of the land to which they relate; as to build on certain land, to keep up a road, to keep a space of ground open. 3. Covenants relating

to the production of writings and title-deeds; as, in cases where an estate is divided into fractions and sold to different persons, one of the purchasers, usually the purchaser of the most valuable share, holds the deeds and writings.

At common law, none but parties or privies, by contract or estate, could take advantage of covenants, or be bound by them. The 32 Hen. VIII. c. 34, gave to the grantees of reversions generally the same advantages and remedies as were possessed by the original lessors or grantors of the land. The statute placed the parties to whom it applied in the position of those who were privy to the original contract. To covenants, however, merely collateral, the statute does not apply; that is, if the covenant is beneficial to the lessor, without regard to his continuing the owner of the estate, it is a collateral covenant, upon which the assignee of the reversion cannot sue. But the assignee of the reversion is entitled to the benefit of all covenants entered into by a lessee with the lessor, his heirs and assigns, provided such assignee be the owner of the reversion immediately expectant on the term, and provided the estate he has be the same estate which, or a portion of which, the lessor had at the time of granting the lease. If there be a title paramount by escheat or otherwise, the covenant is at an end, if such title defeats the lessor's estate.

It was a common practice, in order to secure the performance of a covenant, to take a bond as an additional security. It enabled the obligee to elect between an action of debt for the penalty of the bond, or to proceed upon the covenant. The reason of the practice was, that at common law a devisee of the real estate of the covenantor was not liable to an action for a breach of covenant, though by the statute of fraudulent devises (3 W. and M. c. 14) he was liable to an action for breach of the condition of the bond. But the 1 W. IV. c. 47, extends the provisions of the 3 W. and M. to a covenant.

By the 3 and 4 W. IV. c. 42, actions on covenants must be brought within twenty years after the cause of action has arisen.

Covenants may be discharged by a release, by their performance, by the destruction of the seal, or by the destruction of the interest upon which the covenant depends. They may be void, owing to the personal incapacity of one of the parties to agree, as being an idiot or a lunatic, or their object being illegal, as relating to bribery, gaming, illegal insurances, or usury. They will also be void if opposed to public utility, as not to trade generally, though a covenant not to trade in a particular place, or with a particular person, is valid.

COVENANTERS. [CAMERONIANS.]

COVENTRY, a city, municipal borough, and parliamentary borough, is situated in Warwickshire, in a level tract of country, 91 miles N.N.W. from London by the road, and 94 by the North-Western Railway. The small river Sherburn flows through the city. Coventry was constituted a county by an Act of Henry VI. in 1451. The county of the city of Coventry comprises an area of 10,150 acres, exclusive of the area of the city itself, which comprises 4,920 acres. The population of the city in 1841 was 30,743. The population of the county, exclusive of the city, was 10,664. The city is divided into 6 wards, and is governed by 12 aldermen, of whom one is mayor, and 36 councillors. The population of the parliamentary borough, which returns two members to the House of Commons, was 30,179.

The prosperity of Coventry appears to have been originally owing to Leofric, fifth earl of Mercia, who founded a monastery there, and bestowed many privileges on the town, of which he was the lord. Earl Leofric's wife was the celebrated Lady Godiva. The old legend of her riding naked through the city seems to rest on no good authority. Leofric died in 1057, and the strange and improbable story is not mentioned in any known writer earlier than Matthew of Westminster, who was living in 1307, 250 years afterwards. The lordship afterwards became vested in the earls of Chester, the earls of Leicester, and, in the reign of Edward III., in the earls of Cornwall, when, being thus annexed to one of the royal titles, Coventry became an especial object of royal favour. Edward the Black Prince frequently resided there.

The wall was begun in 1355. The thickness was 9 feet. There were 32 towers and 12 gates. The circumference was three miles; and it was 40 years before the wall was entirely finished. It was pulled down by order of Charles II. because Coventry had set at defiance Charles I. and his army, when he appeared before the gates and demanded admission.

In 1397 Richard II. selected Coventry for the great trial by combat between the Duke of Hereford (afterwards Henry IV.) and the Duke of Norfolk. (Shakspere's 'Richard II.,' Act i.)

The priory was founded by Earl Leofric about 1043 for 24 monks of the order of St. Benedict. It was surrendered to the commissioners of Henry VIII. in 1538, and was soon afterwards taken down. There was also a cathedral, a splendid edifice, built on the model of Lichfield Cathedral. It was taken down at the same time as the priory. A beautiful Gothic cross, for which Coventry was formerly celebrated, was suffered to fall into decay, and the last fragments of it were removed in 1771. The Gray Friars, or Friars Minors, and the Carmelites, or White Friars, had each a monastery in Coventry. The buildings are entirely gone except a fine steeple with a spire springing from an octagon, which belonged to the monastery of the Gray Friars.

There are three ancient churches in Coventry, and one modern church built under the parliamentary commissioners. That beautiful piece of architecture, the steeple of St. Michael's Church, was begun in 1373, and finished in 1395. The square tower is 136 feet high, and supports, on eight arches springing from the pinnacles, an octagon 32½ feet high, from the inside of which the spire, fluted and embossed, rises to the height of 139½ feet. The entire height is therefore 308 feet. The interior of St. Michael's is lofty, the columns clustered, and the ceiling of oak ribbed and carved. Trinity Church is smaller than St. Michael's, but is a handsome structure, with a

tower and spire. St. John's Church is also ancient, but is still smaller.

St. Mary's Hall is one of the glories of ancient Coventry, which still remains. It is 21 yards long, 10 yards wide, and 11 yards high. The roof of carved oak, the gallery for minstrels, the armoury, the chair of state, and especially the great painted window facing the street, furnish a vivid idea of the manners of the age in which Coventry was the favourite resort of princes. A tapestry made in 1450, measuring 30 feet by 10, and containing 80 figures, is a curious and beautiful specimen of the drawing, dyeing, and embroidery of that period. This hall is the property of the corporation, and is used as a council chamber, and for civic festivities. The hospital in Gray Friars' Lane is very ancient, and richly ornamented with carved oak.

Coventry was renowned for its exhibition of pageants and processions; and in the monastic ages it was remarkable for the costly performance of the religious dramas called Mysteries. Accounts are extant of these shows as early as 1416. They were performed on moveable street stages chiefly by the Gray Friars, on the day of Corpus Christi. The subjects were the Nativity, Crucifixion, Doomsday, &c.; and the splendour of the exhibitions was such, that the king and the royal family, with the highest dignitaries of the church, were usually present as spectators.

The general appearance of the town is gloomy and crowded, many of the streets being narrow, and darkened by the projection of the upper stories of the timber-houses built in the fifteenth and sixteenth centuries. The streets are lighted with gas, but are not generally supplied with public sewers. In addition to the buildings already noticed, there are the County Hall, a stone edifice erected in 1785; the Draper's Hall, which is ornamented with Tuscan pilasters, and is used for assemblies and other public entertainments; the Gaol, rebuilt within these few years by the corporation at an expense of above 16,000*l.*; the House of Industry, or Poor House; the Workhouse; the General Hospital; Bablake School and Hospital; and several guilds, and other charitable institutions. Coventry has also a well-endowed free school, a large Lancasterian school, Sunday-schools, and several good private academies, with places of worship for Catholics, Presbyterians, Unitarians, Independents, Baptists, Methodists, and Quakers.

Previous to the war between England and France in 1694, the staple manufacture was woollens, broad-cloths, and caps. During the eighteenth century there was a flourishing manufacture of tammies, camlets, shalloons, calimancoes, gauzes, &c. At present the staple manufactures are ribands and watches. The riband manufacture was introduced about 1730, and in 1830 the number of individuals to whom it afforded employment in the city and adjacent villages was about 16,000. Of late years this manufacture has not been so prosperous. The manufacture of watches was introduced about 1800, and has become so extensive that the annual number manufactured is said to be equal to that of London. The local position of Coventry is favourable for commercial operations, being nearly central between London, Bristol, Liverpool, and Hull; possessing great facilities of water communication by the Coventry and Oxford Canal, which opens into the Grand Trunk navigation; and being on the line of the London and North-Western Railway.

The assizes for Coventry and Warwickshire are held in the city, and quarter sessions are held, of which the recorder is sole judge.

COVERDALE, MILES, bishop of Exeter, a native of Yorkshire, was born in 1487. He was educated in the house of the Augustine friars in Cambridge. Whether he took a degree at the University of Cambridge in early life seems uncertain. Being in his early years attached to the religion in which he was brought up, he became an Augustine monk. In 1514 he entered into holy orders, and was ordained at Norwich; but he afterwards changed his religious opinions. About this time, probably 1530 or 1531, the reformed religion began to show itself at Cambridge, where various eminent men, and Miles Coverdale amongst them, began to assemble for conference on those points which had been discussed by the continental reformers. In 1532 he was abroad, and appears to have assisted Tyndale in his translation of the Bible. In 1535 his own translation of the Bible appeared, with a dedication to King Henry VIII. It formed a folio volume, printed, as Humphrey Wanley (Lord Oxford's librarian) thought, from the appearance of the types, at Zürich, by Christopher Froschover. The Psalms in it are those now used in the Book of Common Prayer. About the end of the year 1538 Coverdale went abroad again on the business of a new edition of the Bible. Grafton, the English printer, had permission from Francis I., at the request of King Henry VIII. himself, to print a Bible at Paris, on account of the superior skill of the workmen, and the goodness and cheapness of the paper. This edition was seized by the Inquisition, but a few copies escaped, and were brought to England, which enabled Grafton and Whitchurch to print, in 1539, what is called Cranmer's, or 'The Great Bible,' in which Coverdale compared the translation with the Hebrew, corrected it in many places, and was the chief overseer of the work. Coverdale was almoner, some time afterwards, to Queen Catherine Parr, the last wife of Henry VIII., and on August 14th, 1551, he succeeded Dr. John Harman, otherwise Voysey, in the see of Exeter. On the accession of Queen Mary, and the consequent re-establishment of Catholicism, he was ejected from his see, and thrown into prison. On his release, which was on the condition of banishing himself, Coverdale repaired to the court of Denmark; he went afterwards to Wesel, thence to Bergzabern, and finally to Geneva, where he joined several other English exiles in producing that version of the English Bible which is usually called 'The Geneva translation;' part of which, the New Testament, was printed at Geneva in 1557, by Conrad Badius, and again in 1560, in which last year the whole Bible was printed in the same place by Rowland Harte. On the accession of Queen Elizabeth, Coverdale returned

from exile; but, having imbibed the principles of the Geneva reformers, he was not allowed to resume his bishopric, nor was any preferment offered to him for a considerable time. He was afterwards collated to the rectory of St. Magnus, London Bridge. He resigned this living in 1566. The date of his death has been variously stated. The parish register of St. Bartholomew, behind the Royal Exchange, however, proves that he was buried February 19th, 1568, in the chancel of which church a Latin epitaph remained for him, till it was destroyed along with the church in the great fire of 1666. Coverdale was the author of several works calculated to promote the doctrines of the Reformation.

(Strype's *Lives of Cranmer, Parker, and Grindal;* his *Memorials* and *Annals;* Tanner's *Bibliotheca Britannico-Hibernica.*)

The third centenary of the publication of Coverdale's Bible was celebrated by the clergy throughout the churches of England, October 4th, 1835.

COVERED-WAY, a road surrounding a fortified town, or a military post, along the side of the ditch which is opposite to the ramparts. It is usually about 30 feet broad, on the level of the natural ground, and is protected by the mass of earth called the glacis. As the works of a fortress form a series of angles which are alternately re-entering and salient, the covered-way necessarily changes its direction at each angle; and the spaces which are there formed by its branches are respectively designated 're-entering and salient places of arms.'

Under the name of *orlo*, the covered-way is met with in the writings of the first Italian engineers, and it is said to have been invented by Tartaglia, in the 16th century.

An attack on the covered-way is a difficult enterprise, and is usually attended with great loss to the besiegers. The thickness of the glacis renders it impossible to facilitate the assault by forming a breach in it; a grazing fire of musketry from the covered-way disorders the assailants during their approach; and, when arrived at the crest of the glacis, one, and sometimes two rows of palisades form a serious impediment to a descent into the work. Even if an entrance should be gained, the assailants are confined between the traverses [TRAVERSES], and annoyed by the fire of the defenders who have retired behind them, or by a plunging fire from the parapets of the fortress. It is easy to conceive, therefore, that such an attack will scarcely be made unless those fires have been previously in part silenced, and the palisades in the covered-way deranged by a fire of guns or howitzers from the enfilading batteries.

COVERTURE. [WIFE.]

COVILHAO. [BEYRA.]

COW. In the article CATTLE we have given an enumeration of the principal breeds of this most useful of our domestic animals, and under BUTTER and CHEESE an account of these products of the milk. We shall here confine ourselves to a few hints relative to the proper management of a cow, so as to ensure her health, and render her most productive.

Where only one or two cows are kept, and the pasture is limited, care should be taken in the selection of the animals. They ought to be of a superior stock, and bred upon land in the neighbourhood of the same quality. When however, from inferiority of the breed in the neighbourhood, it is deemed advisable to bring a cow from a distant district, she should have been accustomed to worse, not better pasturage, than that to which she is to be introduced. Cows of good breed, fed in rich pastures, do not thrive on inferior land, and would starve on poor land or on hilly or mountain ranges, where a small active hardy cow, a native of the district, would keep herself in tolerable condition. It is however only from cows well fed, and under no necessity of wandering about over poor but extensive pastures, that a full supply of milk is to be expected. At the same time the food should be succulent; otherwise fat, instead of milk, will be produced. A cow may be safely milked to within a month of her calving. It is better that she should be dry before the new milk begins to spring in her udder. A little attention will prevent her from becoming dry too soon. Heifers with their first calf should be allowed to go dry sooner than older cows, in order that the system may not be too much taxed. The heifer should not be allowed access to the bull till the age of fifteen or sixteen months, and the time should if possible be so calculated as to ensure the production of the calf in May, when the weather is mild and the grass succulent. With respect to the treatment of the calf, it has been previously noticed. [CALF.] Cows must be carefully looked to at the time of calving, and except in cases of necessity the process of nature must not be interfered with. When that necessity exists, the aid of a veterinary surgeon must be called in. Heating and disgusting drenches should be avoided. A little warm water, with barley or bean meal in it, and a little ginger, is the most comfortable drink for a cow after calving. The first milk yielded by the cow after calving is of a peculiar quality, and is intended by nature to be taken by the young calf, as a means of clearing its intestines from a mucous fluid (*meconium*); and, when this is not permitted, the calf is more liable to disease than it otherwise would be.

A cottager with about two acres of moderate land may keep a cow, and thus add much to his domestic comforts. For this purpose he will require a small portion of permanent grass fenced off, to allow the cow to take exercise, which is necessary to her health. Her food must be raised in regular succession, and cut for her. The earliest green food is rye; then tares; then clover; which may be made to succeed each other, so as to give an ample supply. Cabbages, beet-root, potatoes, and turnips will continue the supply during the winter; and manure produced by the cow carefully collected will be found sufficient to keep the land in condition. There is very good advice on this management in Cobbett's 'Cottage Economy,' a useful little publication.

It is impossible within a limited space to enter into any observations on the diseases of the cow; nevertheless, we may observe that, when the animal appears sickly, or looks dull or yellow about

the eyes, with a staring coat, a gentle aperient once or twice repeated will often prevent further mischief. It may consist of half a pound of Glauber or Epsom salts, four ounces of sulphur, and two or three drachms of powdered ginger, mixed in a quart of gruel. This drench should be allowed to trickle slowly down the gullet, and not given so quickly as to oblige the animal to gulp it. In accidents, or in acute diseases, the attendance of a veterinary practitioner is indispensable.

Let the keeper of a cow beware of the plan of everlastingly drenching the animal, and let him avoid all advertised medicines. Air, exercise, due shelter, and proper attention to diet, with great cleanliness, will in most cases be found sufficient for the preservation of the animal's health. A sound cow may thus be kept without any serious illness for many years.

A cow is old and unprofitable when she reaches twelve or fourteen years. She should be then sold, and a young one purchased. If the cottager have the means of rearing a cow-calf (the strain being good) in order to succeed the old mother, he will do well; if not, he must lay by a portion of the cow's produce every year to raise the difference between a young cow and an old one. Savings' banks are admirable institutions for this purpose; a few shillings laid by when the produce of the cow is greatest will soon amount to the sum required to exchange an old one for a younger. In these observations we have had the cottager chiefly in view. For further details, the article Ox, in the 'Farmer's Library and Cyclopædia of Rural Affairs,' may be consulted.

COW-TREE, a plant little known, belonging to the natural order *Urticaceæ*, and apparently to the genus *Brosimum*, from which, when wounded, a milky nutritious juice is discharged in such abundance as to render it an important object to the poor natives in whose country it grows. It is described by Humboldt as being peculiar to the Cordilleras of the coast of Caracas. In these places it forms a fine tree resembling the Star Apple of the West Indies. Its flowers and fruit have not been seen by any botanist. From incisions in its trunk flows a glutinous milk, similar in consistence to the first milk yielded by a cow after calving. It has an agreeable balsamic smell, is eaten by the Negroes, who fatten upon it, and has been found by Europeans perfectly innoxious. In chemical characters it is remarkably similar to the milk of animals, throwing down a cheesy matter, and undergoing the same phenomena of putrefaction as gelatine.

COWES. [WIGHT, ISLE OF.]

COWITCH, or COWAGE, consists of the hairs found upon the pods of different species of *Mucuna*. They are exceedingly slender, brittle, and easily detached, and the fragments readily stick into the skin and produce an intolerable itching; hence they are frequently employed for mischievous purposes. Cowitch is also used medicinally as a vermifuge, by being mixed with syrup till of the consistence of honey, and given in doses of two or three tea-spoonfuls. *Mucuna urens* and *pruriens* usually furnish the substance; but that from *M. monosperma* is said to exceed the others in the irritating burning property of its hairs.

COWLEY, ABRAHAM, the son of a grocer resident in Fleet Street, London, was born in 1618, and educated at Westminster School, and Trinity College, Cambridge. He was an early poet, and at the age of fifteen he published a volume called 'Poetic Blossoms,' containing, among other things, 'The Tragical History of Pyramus and Thisbe,' written when he was ten years old. At college, not to mention minor works, he composed the greater part of his 'Davideis,' an unfinished epic, in four books, on the troubles of David. Having refused to take the covenant, he was ejected in 1643, after he had taken his degree of M.A.; and he then settled in St. John's College, Oxford. He followed the queen, Henrietta-Maria, in her flight to Paris in 1646, and was appointed secretary to Lord Jermyn, afterwards Earl of St. Alban's, and employed by the queen in her secret correspondence with the king, and remained abroad ten years. Returning in 1656, he was seized, and obliged to give heavy security for his future behaviour. He obtained, Wood says, through the influence of the men then in power, the degree of M.D. at Oxford in 1657, but he does not appear ever to have practised, and the only fruit of his studies was a Latin poem upon Plants, in six books. Upon Cromwell's death he returned to France, and resumed his office. After the Restoration he obtained a beneficial lease of the queen's lands at Chertsey, in Surrey, whither he retired in 1665, and died in July 1667, in his 49th year. He was buried near Chaucer and Spencer, in Westminster Abbey, where, in 1675, the Duke of Buckingham erected a monument to his memory.

Cowley is characterised by Dr. Johnson as 'the last and undoubtedly the best' of the metaphysical poets.

COWLEY, MRS. HANNAH, whose maiden name was Parkhouse, was born at Tiverton, in Devonshire, in 1743. She was married about 1772, to Mr. Cowley, a captain in the East India Company's army, by whom she had three children. She died at Tiverton, on the 11th of March, 1809, having survived her husband about ten years. 'The Works of Mrs. Cowley, Dramas and Poems,' were published in a collected edition, 1809-1813, 3 vols. 8vo. Among them are three narrative poems of considerable length, but indifferent merit: the 'Maid of Aragon,' the 'Scottish Village,' and the 'Siege of Acre.' The artificial character of her poetical taste is indicated by the fact that she was the 'Anna Matilda' who corresponded with Mr. Merry under his newspaper signature of 'Della Crusca.' Her two tragedies likewise are worthless. Of her nine comedies several are much better. One of them, the 'Belle's Stratagem,' which first appeared in 1780, still maintains its place as a lively and excellent acting play; and 'A Bold Stroke for a Husband,' a play somewhat similar, has been repeatedly revived both in its original shape and with alterations.

COWPARSLEY, a wild umbelliferous plant, called *Chærophyllum temulum*.

COWPARSNEP, a wild umbelliferous plant, called *Heracleum sphondylium.*

COWPER, WILLIAM, was born at Great Berkhampstead in Hertfordshire, of which place his father, the Rev. John Cowper, was rector, on November 15 (old style), 1731. He was first placed at a school kept by Dr. Pitman, at which the cruelty of an elder boy rendered the two years which he spent there two years of misery. Two years more of his boyhood were passed in the house of an oculist, as fears were entertained that he would lose his sight. At the age of ten he was sent to Westminster School, where he stayed till he was eighteen, and studied diligently.

After leaving Westminster, Cowper was articled for three years to a solicitor, and afterwards took up his abode in chambers in the Middle Temple. In 1754 he was called to the bar; and in 1759 he was appointed a commissioner of bankrupts. While residing in the Temple he made love to his cousin, Theodora Cowper, the sister of his correspondent, Lady Hesketh, and dallied with literature. He was a member of a club called the 'Nonsense Club,' consisting entirely of Westminster men, among whom were Bonnell Thornton, Colman, and Lloyd; and he contributed a few papers to the 'Connoisseur,' of which Thornton and Colman were the joint projectors and writers.

His residence in the Temple extended through eleven years. In 1763, the last year of that residence, the offices of the clerk of the journals, reading clerk, and clerk of the committees in the House of Lords, all which offices were at the disposal of a cousin of Cowper's, became vacant about the same time. The last two were conferred on Cowper; but he resigned them almost immediately, from a nervous apprehension of what he called a public exhibition before the House of Lords. He then accepted the office of clerk of the journals. Before however he could enter on its duties, he was unexpectedly required to submit himself to an examination at the bar of the House; and this had such an effect on his mind, that, after two or three attempts at suicide, he abandoned the place on the very day appointed for the examination, and shortly afterwards became insane. He was placed under the care of Dr. Cotton at St. Alban's, with whom he stayed until his recovery in June 1765.

The form which Cowper's madness assumed was that of religious melancholy. In the three subsequent periods of his life during which madness returned to him, from 1773 to 1776, for about six months in 1787, and during the six years preceding his death, its form was the same.

On Cowper's recovery in 1765, he took up his residence in Huntingdon. Here he became acquainted with the family of Mr. Unwin, the beneficial influence exercised by whom on Cowper's subsequent life is well known; and with them he soon afterwards became a boarder. On Mr. Unwin's death in 1767, Cowper and Mrs. Unwin removed to Olney in Buckinghamshire, attracted thither by their esteem for Mr. Newton, who was then curate of the place. Mr. Newton had formed a plan of publishing a volume of hymns, and prevailed on Cowper to assist in composing them. They were afterwards published, in 1776, under the title of Olney Hymns; but Cowper, before he had proceeded far in their composition, was visited with his second attack of madness, which lasted nearly four years.

In 1776, after Cowper's recovery, Mr. Newton removed from Olney. By Mrs. Unwin's advice he was now induced to commence a poem, taking, upon her suggestion, the Progress of Error for his subject; and he immediately went on to write three more moral satires, entitled 'Truth,' 'Table Talk,' and 'Expostulation.' These, together with the poems entitled 'Error,' 'Hope,' 'Charity,' 'Conversation,' and 'Retirement,' and some smaller pieces, were formed into a volume, which was published in 1782. He published a second volume in 1785, containing the 'Task' and 'Tirocinium,' the former of which poems had been commenced on the suggestion of another female friend, Lady Austen. It is to the same lady that we are indebted for the 'History of John Gilpin.' He had begun in 1784, so soon as the 'Task' and 'Tirocinium' had been written, his translation of Homer, which occupied him for the next six years. The translation was published in 1791. During its progress he had changed his place of residence from Olney to the neighbouring village of Weston, on the recommendation of his cousin, Lady Hesketh, with whom he had recently renewed a correspondence which had been long suspended, and whose attentions contributed much to the comfort of his later years. Almost immediately after the translation of Homer was completed, he undertook to superintend a new edition of Milton's Works, and to furnish translations of the Latin and Italian poems. In 1792 he paid a visit to Hayley, at Eartham, in Sussex, not having made a journey for twenty years before. Symptoms of his constitutional malady had occasionally shown themselves during the eight or ten preceding years; and in the beginning of 1794 he was again afflicted with madness. A change of scene being judged desirable, he was removed first to North Tuddenham in Norfolk, thence to Mundsley, and afterwards to East Dereham; and he succeeded in obtaining short intervals of comparative tranquillity, during which he composed one or two small pieces, and revised his translation of Homer. Mrs. Unwin, his faithful companion, died on the 17th of December, 1796; and, after three dreary years, Cowper followed her to the grave on the 25th of April, 1800. He died in his 69th year.

COWRY SHELLS are called by conchologists *Cypræa.* Their beauty has procured them a place among the ornaments of our chimney-pieces, and they have been in demand among civilised and uncivilised nations time out of memory. Cowries are used as small coin in many parts of Southern Asia, as in India, the Burmese Empire, Siam, &c., and especially on the coast of Guinea in Africa. In 1740 a rupee in Bengal was worth 2400 cowries; in 1766, 2560 cowries; and now, we believe, 3200 may be had for it. [CYPRÆIDÆ.]

COXE, WILLIAM, archdeacon of Wilts, was

born in London, March 1747. In 1768 he was a fellow of King's College, Cambridge. In 1771 he was appointed to the curacy of Denham, near Uxbridge, but soon afterwards he travelled on the continent as tutor, first to the Marquis of Blandford, son of the Duke of Marlborough, and then to Lord Herbert, son of the Earl of Pembroke. His 'Sketches of the Natural, Civil, and Political State of Switzerland, in a series of Letters to W. Melmoth,' 8vo., 1779, was translated into French with considerable additions, of great value and interest, by M. Raymond. In 1784, having visited the northern kingdoms of Europe, Mr. Coxe published 'Travels in Poland, Russia, Sweden, and Denmark,' in 5 vols. 8vo., which were translated into French. After the publication of this work, at different periods he again visited the continent with Mr. Samuel Whitbread, the son of Mr. Portman, of Bryanston, Dorset, and Lord Brome, eldest son of the Marquis Cornwallis. In 1788 he was presented to the rectory of Bemerton, Wilts, and in 1794 he was made chaplain of the Tower.

Coxe had collected a considerable store of information during his travels, of which he availed himself in writing several historical works, the most important of which is the 'History of the House of Austria, from the foundation of the Monarchy by Rudolf of Habsburg to the death of Leopold II. in 1792,' 3 vols. 4to., London, 1807. Coxe also wrote—1. 'History of the Kings of Spain of the House of Bourbon, from 1700 to 1788,' 3 vols. 4to., 1813. 2. 'Memoirs of John, Duke of Marlborough, with his Original Correspondence,' 3 vols. 4to., 1817–19; an elaborate and valuable work. 3. 'Memoirs of Sir Robert Walpole, Earl of Orford, illustrated with Original Correspondence and Authentic Papers,' 3 vols. 4to., 1798. 4. 'Account of the Russian Discoveries between Asia and America; to which are added, the Conquest of Siberia, and the History of the Transactions and Commerce between Russia and China,' in 4to. 5. 'Private and Original Correspondence of Charles Talbot, Duke of Shrewsbury, with King William III., the Leaders of the Whig Party, and Others.' 6. 'An Historical Tour in Monmouthshire, illustrated with plates from the drawings of Sir R. C. Hoare,' 2 vols. 4to. 7. 'An Account of the Prisons and Hospitals in Russia, Sweden, and Denmark, with Remarks on the Different Modes of Punishment in those Countries,' 8vo. 8. 'Literary Life and Select Works of Benjamin Stillingfleet,' 3 vols. 8vo.; besides several minor works.

In 1803 he married Eleanora, daughter of Walter Shairp, consul-general of Russia. In 1805 he was appointed archdeacon of Wilts. After publishing the 'Memoirs of Marlborough,' in 1819 his sight failed him, and he became gradually blind. He died at Bemerton at an advanced age, in June 1828. The following work was published after his death: 'Memoirs of the Administration of the Right Honourable Henry Pelham, collected from the Family Papers,' 2 vols. 4to., London, 1829.

COXIE, MICHAEL, an old Flemish painter, born at Mechlin, in 1497. He studied first under Bernard van Orley, and afterwards studied the works of Raphael at Rome. His works were chiefly altar-pieces, and many of the best of them were carried to Spain. He died at Antwerp, in 1592, aged ninety-five, in consequence of a fall from a scaffolding, whilst engaged in painting a picture in the town-house of that place.

Though the works of Coxie had much merit, he is now better known for his elaborate copy of the 'Adoration of the Lamb,' in the church of St. Bavon at Ghent, by the brothers Van Eyck, than for his own original productions. It is a large altar-piece, with folding-wings, in two horizontal divisions, an upper and a lower division, each with two wings on a side; six of these wings are now in the royal gallery of Berlin, and the other parts are still at Ghent. Coxie's copy of the two centre pictures of this altar-piece, God the Father, and the actual Adoration of the Lamb, is also in the Berlin Gallery; other parts are in the Pinakothek of Munich, and in the royal gallery of the Hague; in Munich are the large figures of John the Baptist and the Virgin Mary; at the Hague are all the wings.

(Van Mander, *Leven der Schilders;* Waagen, *Verzeichniss der Gemälde-Sammlung des Königlichen Museums zu Berlin.*)

COYPEL, the name of a family of painters. Noel, the first of the family who attained any reputation, was the son of Guyon Coypel, and was born in 1628. Noel rose rapidly in reputation, and was received into the Academy at Paris in 1663. He was appointed by the king director of the Academy at Rome, where he resided some time, enjoying the acquaintance of Bernini, Carlo Maratti, and other eminent painters of the day. Noel Coypel died in 1707, and left two sons, Antoine and Noel-Nicholas. Antoine, his father's pupil, was born in 1661, and accompanied his father to Rome, where he studied the works of the old masters. He made such progress in his profession, that at the age of twenty he was received into the Academy. In 1707 he was made professor and rector, and in 1714 director. He was married, and at his death in 1722 left one son, Charles, also a painter, and his father's pupil, who successively passed all the ranks to the highest in the Academy. Noel-Nicholas, the second son and pupil of Noel, was born in 1692. He was received into the Academy in 1720, during his brother's rectorate. He did not attract much notice until after his brother's death, but then rose rapidly in reputation till the time of his own death, in 1673.

Noel Coypel is skilful and spirited in design, and a lively colourist, but somewhat affected. Antoine, the most famous of the family, has much power and variety in his design, but was too ready to adopt the artificial graces of Bernini, his friend and adviser. Noel-Nicholas, although not free from the factitious elegance of his relatives, possesses a considerable feeling for pastoral enjoyment, which is evinced in some rustic compositions. The principal works of all the Coypels are at Paris. (Argenville.)

COYPOU or COYPU, Molina's name for an aquatic rodent quadruped, the *Quoiya* of D'Azara,

the *Coui*, *Mus Coypus* of Molina and Gmelin, *Hydromys Coypus* of Geoffroy, *Myopotamus Bonariensis* of Commerson. *Myopotamus Coypus* is the name now usually given to it by zoologists.

Generic Character.—Head large; muzzle obtuse; ears small and round; feet five-toed; thumb on the fore feet very short; posterior feet palmated; tail long, conical, strong, scaly, and sprinkled with scattered hairs. Dental formula:—

$$\text{Incisors, } \frac{2}{2}\text{; Molars, } \frac{4-4}{4-4} = 20.$$

Coypou (*Myopotamus Coypus*).

Description.—The Coypou is less than the beaver, which in many respects it much resembles, excepting in the form of the tail. Like the beaver it has two kinds of fur; an outer coat of long ruddy hairs, and an under garment of fine brownish wool, much used in the manufacture of hats. In France the skins of this animal are sold under the name of Racoonda. M. Geoffroy mentions that in certain years a single French furrier, M. Bechem, has received from 15,000 to 20,000 skins. They are imported into Great Britain to a large amount; from 600,000 to 800,000 have been stated as the importation of one year, principally from the Rio de la Plata, under the name of Neutria or Nutria, an appellation derived from some supposed similarity in the habits and appearance of the animal to those of the otter, the Spanish name of which is Nutria.

The Coypou is extensively spread in South America, and is gregarious and aquatic, residing in burrows, which it excavates along the banks of rivers. Its general colour is brownish red; the edges of the lips and the extremity of the muzzle are whitish. The female produces from five to seven young at a birth, to which she manifests great attachment. Though the principal food of this animal consists of vegetable matters, it also, as is affirmed, feeds upon shell-fish. When attacked by dogs, it defends itself fiercely, and inflicts severe wounds with its teeth. Its flesh is white and excellent. In captivity, the Coypou becomes gentle and familiar, and is pleased with marks of attention. Length of an adult male one foot eleven inches, exclusive of the tail, which is one foot three inches. For an account of the anatomy of the Coypou, see, the *Proceedings of the Zoological Society for* 1835.

COYSEVOX, ANTOINE, a French sculptor, was born at Lyon in 1640. He distinguished himself at Lyon as early as his seventeenth year, by a statue of the Virgin, and he went afterwards to Paris to perfect himself under Lérambert. After having been employed for some years at Saverne in Alsace, he returned to Paris, and was elected a member of the Academy in 1676. He made two bronze statues of Louis XIV., one for the court of the Hôtel de Ville, and the other, a colossal equestrian statue, for the States of Bretagne. Among his most celebrated works are the two winged horses, in marble, mounted by Fame and Mercury, placed one on each side of the entrance to the garden of the Tuileries from the Place de la Concorde; they were originally in the garden of Marly. In the garden of the Tuileries there are also a young fawn, a flute-player, and two other figures, by Coysevox. He made also for the garden of Marly the groups of Neptune and Amphitrite, for Chantilly the marble statue of the great Condé, and many works for Versailles, including two personifications in bronze of the rivers Dordogne and Garonne. Some also of the finest sepulchral monuments in Paris are by Coysevox; the most elaborate of which is that of Colbert at St. Eustache. Coysevox was also an eminent sculptor of busts. When he died, in 1720, he was chancellor of the Royal Academy of Painting and Sculpture. (De Fontenni, *Dictionnaire des Artistes*, &c.; Galignani, *History of Paris*.)

CRAB (Zoology), *Cancer*, Leach; *Platycarcinus*, Latreille, Edwards. Dr. Leach restricted the genus *Cancer* to the form of *Cancer pagurus*, Linn., the large eatable crab of our coasts, which was, when he defined the genus, the only species known.

Generic Character.—External antennæ with the basilar joint broad, very long and thick, filling the hiatus between the inner canthus of the orbit and the front, and terminating forwards in a strong, angular, tooth-like projection, directed forwards and a little inwards, reaching beyond the frontal line. The terminal or moveable portion is slender, very short, and arises from the internal part of the basilar joint, nearer to the cell of the internal antennæ than to the orbit. The internal antennæ, instead of lying obliquely outwards or transversely, as in most other genera of this section, are directed forwards; a character by which *Cancer* may at once be distinguished from *Platypodia*, *Carpilius*, *Xantho*, &c. The second joint of the inner footstalk of the external pedipalps is excavated at the anterior part of the inner margin; in some species the notch is confined to the angle, in others it extends half way down to the side of the joint. The first pair of feet is nearly equal, in some specimens of each species the difference in size being scarcely appreciable. They are, generally, very robust. The remaining feet have no spines, but are in most species more or less hairy. The abdomen of the male has five, that of the female seven joints. (T. Bell.)

Geographical Distribution.—With the exception of our indigenous species, *Cancer pagurus*, they are all, as far as their localities are known,

exclusively natives of the coasts of the hotter parts of America. (T. Bell.)

Mr. Bell, in his interesting paper on the genus *Cancer* ('Zool. Trans.,' i. 335), gives three new species, viz. *Cancer longipes, Cancer Edwardsii*, and *Cancer dentatus*, brought home by Mr. Cuming and Mr. Miller, besides *Cancer irroratus* of Say, and *Cancer pagurus*, which last was considered the type by Dr. Leach.

The term *Crab* in common language is applied to the great bulk of the Brachyurous Crustaceans. The different genera are given under their appropriate titles, CORYSTES, GECARCINUS, PAGURIANS, &c.

CRAB, a kind of portable windlass, or machine for raising weights, or otherwise exerting force, by winding a rope or chain round a horizontal barrel. Crabs are usually mounted in a strong heavy framework of wood or iron; and, when employed for a temporary purpose, but one which involves considerable strain, they are either bolted down to a temporary foundation, or loaded with heavy weights put upon the framework.

CRABBE, GEORGE, was born at Aldborough, in Suffolk, on December 24, 1754. His parents were in an humble condition of life, the father being a warehouse-keeper, and collector of the salt-duties, or saltmaster, at Aldborough; but they gave their son a good education, and apprenticed him to a surgeon. Crabbe had no great liking for his profession, and even during his apprenticeship occupied himself in writing verses. After he was out of his time, he determined to abandon his profession and to seek literary employment in London. With only a few pounds in his pocket, borrowed from Mr. Dudley North, with whom he had but a very slight acquaintance, he worked his way on board a sloop to London, where he arrived in April 1780. His first efforts to obtain employment were unsuccessful. His poem of 'The Candidate' was published; but the bookseller failed, and his hopes of profit from that source were lost. He was soon reduced to a state of extreme distress, and, after having been neglected or repulsed by Lord Shelburne and Lord Thurlow, he applied in a simple and eloquent letter to Edmund Burke.

Burke immediately appointed a time at which he would see Crabbe; he received him with great kindness, and encouraged him to show him all his compositions. Having selected 'The Library' and 'The Village,' he took these poems himself to Mr. Dodsley. 'The Library' was in consequence published in 1781. But Burke's attention did not stop here. He assisted him with money, introduced him to Fox, Sir Joshua Reynolds, Lord Thurlow, and other distinguished friends, and advised Crabbe to enter the church. Through Burke's influence Crabbe was admitted to deacon's orders, in December 1781, by Dr. Yonge, bishop of Norwich, and was ordained a priest in August 1782. Shortly afterwards he obtained the situation of domestic chaplain to the Duke of Rutland, and resided in consequence at Belvoir Castle. 'The Village' appeared in 1783, after having been revised by Dr. Johnson: its success was great, and Crabbe's reputation was now fully established. In the same year Lord Thurlow presented him with two small livings in Dorsetshire, and Crabbe married Miss Sarah Elmy.

Crabbe published 'The Newspaper' in 1785. He did not come forward again as an author until 1807, when, after an interval of twenty-two years, appeared 'The Parish Register.' He resided in the meanwhile successively at various places connected with his clerical duties; at Stathern and Muston in Leicestershire, and at Parham and Great Glemham in Suffolk.

Together with 'The Parish Register' there appeared, in 1807, 'Sir Eustace Grey' and other smaller pieces, and a reprint of his earlier poems; the object of the publication being to enable him to send his second son to Cambridge. Three years afterwards he published 'The Borough.' In 1813 he sustained a heavy affliction in the loss of his wife. In the same year the Duke of Rutland, the son of his former patron, gave him the living of Trowbridge in Wiltshire, to which was added the incumbency of Croxton near Belvoir.

The remainder of Crabbe's days were, with the exception of occasional visits to his friends in London and elsewhere, passed at Trowbridge, where his conscientious discharge of his duties and his amiable character gained for him the love of all his parishioners. His 'Tales of the Hall' were published in 1819 by Mr. Murray, who gave him 3000*l.* for them and the remaining copyright of his previous poems. From 1828 there was a perceptible change in his health, and, though his mind retained its wonted cheerfulness, his strength of body gradually declined. He died on the 3rd of February, 1832, in his 78th year. The shops in Trowbridge were closed as soon as his death was known, and again on the day of his funeral; and a subscription was immediately set on foot among his parishioners for a monument to their departed rector, which has since been placed in Trowbridge Church.

The distinguishing excellences of Crabbe's poetry are simplicity, pathos, force, and truth in describing character. An edition of Crabbe's poems in eight volumes was published by Murray in 1834. The eighth volume consists of a collection of tales in verse, then published for the first time, which did not add much to the author's reputation. The Life by his son, the Rev. George Crabbe, a very pleasing piece of biography, occupies the first volume.

CRABRO'NIDÆ (Leach), *Crabronites* (Latreille), a family of hymenopterous insects of the section *Aculeata* and subsection *Fossores*. Head large, and appearing almost square when viewed from above; body oval or elliptical, narrowed more or less at the base, and joined to the thorax by a peduncle; antennæ short, and generally thickened at the apex.

According to Latreille, the following genera are included in this family:—*Tripoxylon, Gorytes, Crabro, Stigmus, Pemphredon, Mellinus, Alyson, Psen, Philanthus*, and *Cerceris*.

These insects are extremely active in their movements, and may be frequently seen settling on the flowers of umbelliferous plants, on palings, or on leaves, when the sun is shining upon them,

lying in wait in such situations for the approach of other insects, which they seize and carry to their nests, for the purpose of feeding their larvæ. The larger species of this country are mostly of yellow and black colours, the body being adorned with rings of the former; the smaller species are for the most part black. Some form burrows in the ground for the reception of their larvæ, some in rotten trees, palings, or posts; each burrow is stored with flies of various species, on which the larvæ feed.

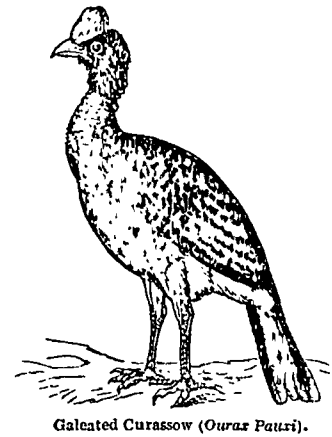
CRA'CIDÆ, a family of gallinaceous birds (*Rasores*), all natives of Mexico and South America, and many of large size, approaching the turkey in magnitude. The hind toe, instead of being articulated high on the tarsus, as in the gallinaceous or rasorial birds, generally is on a level with the rest, and adapts the feet for arboreal habits. The legs are spurless. The tail is ample, and composed of stiff feathers. In several species, as the Galeated Curassow, the Guan, and others, the windpipe makes one, two, or even three deep folds between the skin and muscles of the breast, before passing into the cavity of the chest. Berries, and various sorts of grain, constitute their food, and their flesh in delicacy and whiteness surpasses that of the fowl or turkey. In many parts of South America, these valuable birds have been long reclaimed, and, as Mr. Burnett well observes, 'it is really surprising, considering the extreme familiarity of their manners, and the facility with which they appear to pass from a state of nature to the tameness of domestic fowls, that they have not yet been introduced into the poultry-yards of Europe. That with proper treatment they would speedily become habituated to the climate, we have no reason to doubt; on the contrary, numerous examples have shown that they thrive well even in its northern parts; and M. Temminck informs us that they have been once at least thoroughly acclimated in Holland, where they were as prolific in their domestic state as common poultry. The establishment however in which this had been effected was broken up by the civil commotions which followed in the train of the French Revolution, and the results of much labour lost by its complete dispersion.'

The present family comprises several genera, of which the following is an outline:—

Genus *Ourax*.—Bill short, strong, compressed, vaulted, convex, and dilated at the base of the upper mandible into a horny, oval, hard, and elevated helmet; nostrils basal, and hidden; head covered with short and close-set feathers; tarsi long and smooth.

Example.—The Galeated Curassow (*Ourax Pauxi*, Cuvier). Size that of a small hen-turkey. General colour, brilliant black, except the abdomen and under tail-coverts, which are white, as are also the tips of the tail-feathers; legs red; head and neck clothed with short velvety feathers. This species is a native of Mexico, and associates in large companies, perching upon the trees. The nest is generally made on the ground, and the young are led about by the female. At first the food of the chicks consists of insects and their larvæ, to which seeds or fruit are gradually added.

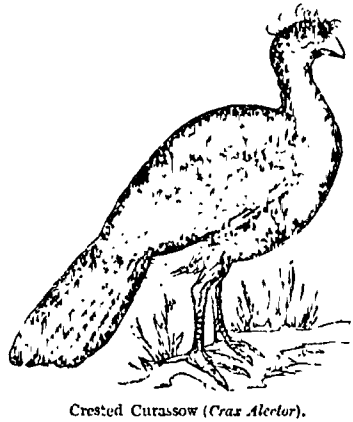
This species is easily domesticated, and is enumerated by M. Temminck among the birds which bred abundantly in Holland before the French Revolution. The *Ourax mitu*, Cuvier, is another species.



Galeated Curassow (*Ourax Pauxi*).

Genus *Crax*.—Bill moderate, high at the base, thick, carinated above, surrounded by a basal membrane; lore naked; nostrils lateral, longitudinal, placed in the cere; head crested with curled feathers; tail ample, composed of 14 feathers.

Example.—The Crested Curassow (*Crax Alector*). Size that of the Galeated Curassow. Colour black, with a greenish gloss; abdomen and under tail-coverts white; the head adorned with a full velvety crest, capable of being raised or depressed at will; cere yellow. This species is a native of Mexico, Guiana, and Brazil. In the woods of Guiana it is extremely abundant, congregating in numerous flocks, which are often thinned by the hunter's gun. 'They build their nests in the trees,



Crested Curassow (*Crax Alector*).

forming them externally of branches interlaced with the stalks of herbaceous plants, and lining

them internally with leaves. They generally lay but once a year, during the rainy season, the number of their eggs being from six to eight. They are nearly as large as those of a turkey, and of a white colour.

For observations on the anatomy of the *Ourax mitu*, and *Crax Alector*, and *Crax Yarrellii*, see 'Proceeds. Zool. Soc.,' 1830-31.

Genus *Penelope*.—Bill moderate, naked at the base, wider than high, convex above. Under the throat a naked skin capable of being inflated; nostrils placed in the cere towards the middle of the bill, and half closed; tarsi long and slender; tail feathers 12.

Example.—The Guan (*Penelope cristata*). Length about 30 inches; upper parts dusky black, or bronze glossed with green; a black stripe passes from the bill backwards, and surrounds the ear; forepart of the neck and breast spotted with whitish; lower part of the back and abdomen reddish; cheeks naked, and of a violet-purple; bill blackish; head crested with a tuft capable of being raised or depressed at will; pendent skin under the throat scarlet. The plumage of the female is tinged with red.

The Guan is a native of Guiana and Brazil, where it inhabits the woods, and is often seen in large bands; nevertheless, it is said to be monogamous, the males and females pairing together with the strictest constancy. The nest is built on the branches of a tree, and the eggs are from three to five in number. All the birds of this genus appear to be known in Brazil by the name of *Jacu* pronounced *Yacou*, derived, according to Marcgrave, from their loud and clamorous note, which, when uttered by numbers, makes the woods resound. For a detailed account of the loops of the trachea in this species, see 'Proceeds. Zool. Soc.,' 1833, Part 1.

Genus *Ortalida*.—Characters the same as those of *Penelope*, excepting that the head is completely feathered, and that there is no nakedness about the throat or round the eyes.

Example.—The Motmot Guan (*Ortalida Motmot*). This species, the *Phasianus Motmot* of Gmelin, and the *Ph. Parraqua* of Latham, is a native of Guiana. It agrees with Guan in general habits; but we know less respecting it than respecting others of this family. General colour red brown, bronzed above.

Genus *Opisthocomus*.—Bill short, robust, and convex; feet large and strong; tail feathers ten.

Example.—The Hoatzin (*Opisthocomus cristatus*). This bird, the Hoatzin of Hernandez, is known in Guiana, according to Sonnini, by the name of *Sasa*. It gives preference to woods bordering rivers, and flooded savannahs, rather than to higher grounds. It lives in pairs, or small companies of six or seven individuals, and feeds much on the leaves of the *Arum arborescens*. The flesh of this species is not in high repute, and has a rank musky flavour and smell; and hence medicinal properties have been attributed to it by the natives, who nevertheless deem it a bird of ill omen. In gait and stature it bears much resemblance to the peacock, but not in colouring. The head is crested.

Some regard the genus *Megapodius* of Australia as belonging to the present family. In that country it may perhaps represent the *Cracidæ* of America, but it is the type of a distinct form.

CRACOW, Russian Province. [POLAND.]

CRACOW (*Krakow*), a part of the old kingdom of Poland, which, by the Partition Treaty of 1795, fell to the share of Austria, and in 1809 formed with Western Galicia the Grand Duchy of Warsaw. At the Congress of Vienna in 1815, Austria, Russia, and Prussia, not being able to agree to which of them it should be assigned, formed it into an independent republic, and guaranteed the perpetual neutrality and inviolability of its territory, except in case of its harbouring offenders against any of the three protecting powers. In the general attempt at revolution in Poland in 1846, the city of Cracow was seized by the insurgents; the three protecting powers therefore concentrated a large force on the city and territory of Cracow, and, after crushing the insurgents, resolved, by a decree dated Nov. 16, 1846, that the territory of the republic should be incorporated with Austria as previous to 1809, which was accordingly done.

The territory of Cracow lies between Austrian Galicia, Prussian Silesia, and the south-western part of Russian Poland, along the northern bank of the Vistula, and contains an area of about 500 square miles, and a population of 145,787, almost all of whom are Poles. The surface consists of an undulating plain, broken by low hills. The Vistula, which is the chief river, becomes navigable under the walls of Cracow. The climate is moderate, though not genial enough to ripen the grape. The soil is rich; its chief productions are corn, pulse, flax, some fruits, and honey. Oxen, sheep, swine, game, and fish are abundant. Coals, iron, marble, freestone, clay, &c. are found. The quantity of wood is inconsiderable.

Cracow contains only two or three manufacturing establishments, the chief of which are the ironworks of Krzessowice. The peasantry spin and weave their own cloth, and there is little trade except in the capital.

CRACOW, properly *Krakow*, the capital of the old kingdom of Poland, is situated in a delightful and extensive valley on the left bank of the Vistula, at its confluence with the Radeva, in 50° 4′ N. lat., 15° 15′ E. long., and has 42,990 inhabitants, of whom one-sixth are Jews. It is inclosed by three hills, on one of which a monument, 120 feet high, has been erected to Kosciusko. It is united to the Galizian town of Podgorze, on the right bank of the Vistula, by a bridge of rafts. The town is surrounded by promenades, which have replaced the old ramparts. It consists of three distinct quarters, Cracow, Stradom, and Kasimierz, the last of which, on an island in the Vistula, is joined to the rest of the town by a bridge.

Cracow received its name from Krakus, duke of the Poles and Bohemians, who is said to have founded it about A.D. 700. It was made the capital of Poland in 999 by Boleslaus the Great. It was formerly much larger than it is now, and its population treble of what it is at the present day; it had also a flourishing commerce, and its numerous

lofty towers and buildings still give to it, in the distance, the appearance of a large and handsome city; but this impression is destroyed on entering its dark, narrow, and deserted precincts. The town is however clean, and has a very spacious public square, surrounded with low miserable shops.

The most striking of its ancient monuments is the cathedral, the finest specimen of Gothic architecture in Poland. Here the kings of Poland were crowned, and its numerous chapels recall the events of the history of this kingdom from Boleslaus to Kosciusko. It has 50 altars, above 20 chapels, and contains the tombs of most of the Polish kings and heroes. The archives and library preserved in this edifice contain many valuable manuscripts. Its bell, the largest in Poland, was cast in 1520.

The castle, called the Königsburg, on Mount Wavel, a very spacious structure, was founded about the year 700. It was rebuilt by Augustus II. of Poland. Of the 71 churches which Cracow once contained, only 38 are at present devoted to the purposes of divine worship. The finest of these are the church of St. Mary, and that of St. Stanislaus, which is the oldest church in the city. The other remarkable edifices are the episcopal palace, a spacious building of modern construction, and the old town-hall. Among the public establishments of Cracow are a gymnasium, a normal school, several hospitals, and a university, which was founded in 1364 by Casimir the Great. The trade, which is principally in the hands of the Jews, is not extensive, although Cracow is the chief depôt of Hungarian wines, salt, and wax, and the central point of commerce between Poland, Galicia, and Hungary. Cracow is connected by railway with Warsaw, Berlin, and Vienna.

CRADLING, slight timber-framing constructed under floors in order to form arched or coved ceilings.

CRAG, the uppermost of the distinctly tertiary strata of England—using this term in a sense which is perhaps gradually passing away, to be replaced by the larger meaning of *Cainozoic*. The crag of Norfolk and Suffolk is partly a calcareous mass rich in delicate corals; partly a subcalcareous sand rich in shells; and partly a rudely aggregated deposit of sand, shells, pebbles, and bones. To these divisions, the origin of which is due to different local conditions and successive times, Mr. Charlesworth has assigned the titles of Coralline Crag, Red Crag, and Mammaliferous Crag. In Mr. Lyell's classification they rank as Pleiocene deposits.

CRAIG, JOHN, was educated at St. Andrew's, Scotland, and afterwards entered the Dominican order. He travelled much in England and on the continent on various ecclesiastical missions; but, having become a convert to the opinions of Calvin, he was seized and tried at Rome before the Court of Inquisition, by which he was condemned to be burnt. He however escaped, and, after passing through Germany, returned to his native country, where he was appointed minister of Holyrood House, and became a principal coadjutor of Knox in the work of reformation. He was afterwards appointed minister of Montrose, and in 1574 minister of Aberdeen, in which capacity he was chosen Moderator of the General Assembly of the Church of Scotland, which met in October 1576. The following year he was removed to Edinburgh, and in 1579 was associated with the learned John Duncanson as minister to the royal household. He died Dec. 12, 1600, at the age of eighty-nine.

Craig drew up the National Covenant in the year 1580; he was also the author of two theological works—the one an answer to an attack on the Confession of Faith, the other a form of examination entitled 'Craig's Catechism,' which was appointed by the General Assembly to be used in schools and families in place of 'The Little Catechism.'

CRAIG, SIR THOMAS, of Riccarton, was the son of Mr. Robert Craig, Merchant, in Edinburgh. The date of his birth is uncertain, but in 1552 he was sent to the university of St. Andrew's, where he proceeded bachelor of arts, and then went to France to prosecute his studies in the university of Paris. On his return to Scotland, about 1561, the Reformation had just been accomplished, and he changed his religious views for the study of the law; passed advocate in the Court of Session at Edinburgh on Feb. 2, 1563; and in July that year became justice depute to Archibald, fifth Earl of Argyll, hereditary lord justiciar of Scotland.

Craig continued in the office of justice depute till the end of the year 1573, when he was appointed sheriff depute of Edinburgh. From the beginning of the year 1576 Craig was in the courts as a practising counsel down to the beginning of the year 1581. Morton was that year committed to Dumbarton Castle for his supposed concern in the murder of Darnley; and the same year Craig was ordered to enter his person in ward in the same castle of Dumbarton. Craig at last obtained his liberty, but was not replaced in the office of sheriff depute. He continued at the bar with a high professional reputation, and on Jan. 1, 1603, he dedicated to King James a Treatise on the Succession to the Throne of England, which he had written in confutation of the jesuit Parson's Conference on the Disputed Succession, wherein the right of the people to choose their king was boldly reasoned, and the crown indirectly claimed for the Infanta of Spain. Soon after James's accession Craig was appointed one of the commissioners to meet with commissioners from England and treat of a union between the two kingdoms; and in the summer of 1605 he wrote his treatise on the union. About the same time he wrote his treatise on homage, to vindicate Scotland from the charge of feudal dependence on the crown of England, brought against it in the chronicles of Hollinshed. None of these works were ever published.

In the year 1606 Craig held the office of advocate for the church of Scotland. His death took place on Feb. 26, 1608, when he had been upwards of forty-five years at the bar, and probably therefore when he was not much short of seventy-five years of age.

His first appearance as an author was on occa-

sion of the queen's marriage with her cousin Darnley, for which he composed an epithalamium, or marriage song. The piece which is not to be found among Craig's poems in the 'Delitiæ Poetarum Scotorum' was only discovered a few years ago. On the king's departure for England he wrote a few other poems, but the merit of the poetry is not of a high order. The work by which Craig is chiefly known is his 'Treatise on the Feudal Law,' which, though evincing much learning and a powerful mind, is unsatisfactory, as overlooking the evidences of the common law of his country, or sinking them in favour of the feudal and civil laws.

CRA'MBE MARI'TIMA, or SEA KAIL, is a glaucous spreading plant, with broad toothed sinuated leaves, and dense corymbs of large white flowers, found occasionally on the sea-coast of England, and now commonly cultivated in gardens for the sake of its delicate tender shoots. Naturally the flavour of the plant is strong and disagreeable, but is rendered delicate by being grown in darkness, and with a little more speed than usual. For this purpose a garden-pot is inverted over the crown of an old Sea-Kail stock, in the winter before the leaves sprout. Over the pot is thrown a little litter, or some decaying leaves, or some old tan, so as to increase the temperature of the earth, and to exclude light; after a week or two the pot is examined from time to time, and when sprouts five or six inches long have been produced, they are cut off and fit for table. Sea Kail loves a light sandy soil, well drained in winter and richly manured. It will continue to bear cutting for twenty years together without suffering much, and is one of the most simple and useful of all culinary plants for a small garden. It is generally grown in rows eighteen inches or two feet apart.

CRA'MBUS, a genus of moths (*Lepidoptera nocturna*) of the family *Tineidæ* (Stephens).

In crossing dry meadows during the summer-time, we observe numerous little moths fly from the grass at every step we take; they soon settle again, and are then not easily detected, owing to their mode of folding their wings, which when shut almost inclose their slender bodies, and partly surround the blade of grass on which they rest; their form is then long and narrow, pointed at the head, and somewhat truncated at the opposite extremity. Their colouring is often brown and white, disposed on the upper wings principally in longitudinal lines. Very frequently however we find them adorned with beautiful metallic colours, generally of silvery or golden hues. Such are the insects which constitute the genus *Crambus*, and of which we possess about forty species in this country. They are called in England *Veneers*, and sometimes *Grass-Moths*.

CRAMP. [ANTISPASMODICS; SPASM.]

CRAMP, or CRAMPERN, is a piece of metal bent at each end and let into the upper surface of two pieces of stone when their perpendicular faces are joined together. Cramps are employed in the masonry of all solid structures. Iron is mostly used, but copper is more durable. The Greeks used cramps in the construction of their temples, and wooden cramps were sometimes used by the Egyptians.

CRANACH, LUCAS, or *Ludwig Sunder*, an old German painter, was born at Cranach, near Bamberg, in 1472.

He was apparently instructed by his father, and in his twenty-third year (1495) was appointed court painter to the Elector of Saxony; he served in this capacity the electors Frederic the Wise, John the Constant, and John Frederic the Magnanimous. In consequence of this appointment, Cranach settled in Wittenberg, and lived there forty-six years. The incidents in his life are not many, though he lived in an eventful time, and there are some few worthy of note. In 1493 he accompanied the Elector Frederic the Wise to Palestine to the Holy Sepulchre, and made drawings of all that was remarkable and interesting there. He also painted a series of family portraits of the house of Saxony, of himself, and several of Luther, with whom he was intimately acquainted, and whose marriage with Catherine Bora he is said to have promoted. Cranach shared the five years' imprisonment of the Elector John Frederic, who was taken prisoner by Charles V. at the battle of Mühlberg, in 1547; and, after his release in 1552, Cranach retired to Weimar, and died there in the following year, which was the eighty-first of his age, according to the inscription to his memory in the church of St. Jakob.

The principal works of Cranach were executed between 1506 and 1540, and they are nearly all still in Germany, especially in Upper Saxony. His masterpieces are his altar-pieces in various Saxon churches, and one of the principal of these is the large mystical representation of the Crucifixion in the church of Weimar: it is executed with all the laborious care and exactness of the best German painters of that period, of whom Cranach himself was inferior to Albert Dürer alone in his best period, but Dürer's superiority is confined to design and composition. Cranach is said to have also engraved both in copper and wood, and many works are attributed to him, but with very little certainty; there are however many prints in both styles after his works, but few of them probably were executed by himself.

CRANBERRY, the fruit of two species of *Oxycoccus*. The English Cranberry, *Oxycoccus palustris*, is found wild abundantly in the fens of Norfolk, Lincolnshire, and many other parts of England, always by the side of little rills, and not among stagnant water. The fruit is a round austere red berry, which makes excellent tarts and one of the many kinds of marmalade. The Russian cranberries of the shops are borne by this species. The American Cranberry, *Oxycoccus macrocarpus*, is much like the other, but its leaves, flowers, and fruit are larger. It is imported from the United States in considerable quantity, and used for the same purposes as the other; but it is considered of inferior quality.

CRANBOURNE. [DORSETSHIRE.]

CRANE. [HERONS.]

CRANE, a machine employed for rising weights vertically by means of a rope or chain acted upon by a windlass, but carried over a pul-

ley or wheels attached to the extremity of a projecting arm or jib. The common warehouse crane, which is usually formed of iron, may be compared to an inverted L, the vertical portion of which is so mounted as to form a pivot or axis upon which the whole may be swung round; so that the horizontal arm, which is strengthened by diagonal struts, may extend in any direction. The rope or chain of such a crane is conducted along the horizontal arm, and connected with a kind of windlass or crab, which is usually provided with two sets of gearing, for working at different velocities, so that in raising light goods a much greater speed may be given to the chain with the same motion of the winch-handles than when the load is very heavy. Wharf-cranes are frequently of somewhat different construction, owing to the circumstance that they usually stand alone, that is to say, that they are self-supported, instead of being attached to and supported by a wall, or a post secured to a wall. There is a vertical pillar of iron or wood, the lower end of which is firmly secured to a foundation of masonry, while the upper end terminates in a pointed or conical pin, upon which, as a pivot, the revolving part of the crane rests and turns. The arm or jib projects obliquely from the pillar, and is strengthened by diagonal braces. The windlass or crab for working the crane is attached to the central pillar. Some cranes are worked by a tread-mill moved by men; some by horses or oxen; some by the surplus power of a steam engine; some by the compression of air in a strong vessel; some by hydrostatic pressure; but the customary mode is by a winch-handle. Many of the cranes at the principal docks and quays are capable of raising immense weights.

CRANIOLOGY. [PHRENOLOGY.]

CRANK, in machinery, is a bend in an axle by which a reciprocating motion in a rod is made to produce a revolving motion of the axle and of a wheel which may be connected with it.

CRANMER, THOMAS, the second son of Thomas Cranmer, was born at Aslacton, in Nottinghamshire, on July 2, 1489. He was first instructed in a village school, and sent thence to Jesus College, Cambridge in 1503, of which he became a fellow in 1510–11. In the following year he married, and in consequence forfeited his fellowship; but, his wife dying in childbed in about a twelvemonth, he was restored by a somewhat irregular proceeding to his fellowship. In 1523 he took the degree of D.D. Cranmer's opinions as to the invalidity of the marriage of Henry VIII. with Catharine of Aragon, his brother's widow, his assertion of the incompetence of the papal authority to legalise such a marriage, and his proposal to submit the question to English and foreign universities caused him to be introduced at court. He was appointed chaplain to the king, archdeacon of Taunton, and sent with others as ambassador to Rome in 1529. The efforts of the embassy to persuade Pope Clement to consent to the divorce were ineffectual; and in 1530 Cranmer visited France and Germany on the same business. While in Germany, in 1532, he married the niece of Osiander, the pastor of Nürnberg, an imprudent act that reduced him to many unworthy evasions, for very shortly afterwards Henry nominated him to the see of Canterbury, and after some delay he accepted the promotion, and pronounced the oaths of celibacy and obedience to the pope in March 1533, making a protestation, however, 'that he did not intend by this oath to restrain himself from any thing that he was bound to either by his duty to God, or the king, or the country.'

Cranmer, soon after his appointment, discussed the king's cause in convocation; and having travelled to Dunstable, to which town the commission adjourned in order to be near Queen Catharine's residence at Ampthill, he there (23rd May, 1533) declared the marriage null and void. Five days afterwards he publicly married the king to Anne Boleyn, a private marriage having taken place in the January previous. He also officiated at their coronation on the 1st of June, and stood sponsor to the Princess Elizabeth, who was born in the following September. In 1534, when Sir Thomas More and Fisher, bishop of Rochester, refused the oath of supremacy, Cranmer's best endeavours were used in vain, first to overcome the scruples of the recusants, and afterwards to dissuade the king from executing the sentence that had been pronounced upon them. In this year, with the consent of the convocation, he set on foot a translation of the Bible, which was completed and ultimately printed at Paris. In 1535 Cranmer assisted in the correction of a second edition of the King's Primer, a book containing doctrines bordering upon Protestantism, of which it has been asserted that the archbishop was originally the compiler. Cranmer continued in favour throughout the reign of Henry, and though compelled to assist his master in several matters of a questionable character, such as the divorces of Anne Boleyn and of Anne of Cleves, and the destruction of the abbeys, he on the whole contrived to forward the interests of the reformed church and of learning. In 1538 six articles were passed in the House of Lords, to which Cranmer offered a strenuous opposition, one of them being directed against the marriage of the clergy. In consequence of this, Bishops Latimer and Shaxton resigned their sees, but Cranmer retained his, and lived for a time in retirement with his wife, who, however, was soon compelled to retreat to Germany.

In May 1543 appeared the King's Book, which was in fact little more than a new edition of the 'Institution' altered in some points by the papal party: it received its name from the preface, which was written in Henry's name. The clergy being hostile to this book, Cranmer, at a visitation of his diocese, in submission to the king's supremacy, forbade them from preaching against any portions of it, however they or he himself might dissent from them.

In 1544 Cranmer successfully exerted himself in parliament to carry a bill to mitigate the severity of the Statute of the Six Articles. He also assisted in compiling an improved English Litany, essentially similar to that which is now in use. Some political changes in the latter years of Henry's

reign seemed to revive the hopes of the enemies of the reformation, but Cranmer continued to retain his influence, and in 1546, the last year of the king's reign, he sanctioned a resolution that the mass should be changed into a communion, the form of which Cranmer was ordered forthwith to draw up. Henry died on Jan. 27, 1547, and Cranmer was named one of the executors of his will, and one of the regents of the kingdom.

On the accession of Edward, the bishops received anew their bishoprics at his hands. The first public act of the primate was the coronation of the new king (February 20, 1547). An inquiry into the state of religion, by means of a visitation of the whole kingdom, was immediately set on foot: twelve homilies, four of which are ascribed to Cranmer, were drawn up, and ordered to be placed in every church, with the translation of Erasmus's paraphrase of the New Testament, for the instruction of the people; and the Act of the Six Articles and other severe statutes were repealed.

Cranmer's labours were incessant during the reign of Edward VI. in forwarding the reformation. In the legislature he was the active leader and promoter of all measures for that purpose, and the able antagonist of all the adherents of the Roman Catholic ritual. He caused to be prepared Cranmer's Catechism written in Latin and German by one Justin Jonas; he was at the head of the commission for framing the Liturgy; he wrote a 'Defence of the true Doctrine of the Sacrament;' and he assisted in procuring the Service Book and the Book of Common Prayer to be adopted by parliament in 1552. The only drawback on his character during this period of his life, was his harshness and persecuting spirit to his more eminent opponents, particularly Bonner and Gardiner, an exception to the usual moderation of his conduct.

In 1553 King Edward died, and Cranmer signed the letter sent by Northumberland to the Princess Mary, declaring Jane Grey to be queen. This was his only act against Mary, and on July 20 he signed the order sent by Mary to Northumberland to disarm. On Mary's accession, the hopes of the Protestants were at an end; her unshaken attachment to the Roman Catholic creed was universally known; Gardiner was released from prison and made chancellor, and power of appointing preachers given to him instead of to the primate: a commission was also granted to the bishops of London, Winchester, Chichester, and Durham, to degrade, and imprison Protestant prelates and ministers on the charges of treason, heresy, and matrimony.

Cranmer's friends recommended his immediate flight; but he rejected their advice. In the beginning of August he was summoned before the council, and ordered to confine himself to his palace: on the 27th he was again brought before the same tribunal, and in September, together with Latimer and Ridley, was committed to the Tower. Soon afterwards he was sent with his fellow-prisoners to the prison of Bocardo at Oxford. After repeated examinations, he was at length declared contumacious by the pope (Paul IV.), guilty of heresy and other enormities, and condemned to be executed. On Feb. 14, 1556, he was degraded, and a few days afterwards, having maintained an admirable constancy till then, his firmness gave way, and he recanted. The recantation, however, could not preserve his life. On the 20th of March, the eve of his execution, he was visited by one Garcina, who requested him to transcribe a recantation, to be delivered by him at the stake, which the prisoner consented to do. On the following day he was led to St. Mary's Church, where, after an exhortation had been read by Dr. Cole, the provost of Eton, and Cranmer had finished his private devotions, he solemnly addressed the people, openly professing his faith, and at length declaring, 'Forasmuch as my hand offended in writing contrary to my heart, therefore my hand shall first be punished. For, if I may come to the fire, it shall be first burned. And as for the pope, I refuse him, as Christ's enemy and antichrist, with all his false doctrine.' The whole assembly was astonished at this speech: they had supposed that he would have confirmed and not retracted his recantation. He was then hurried away to the stake, where he stood motionless, holding up his right hand, and exclaiming, until his utterance was stifled, 'This unworthy hand! Lord Jesus, receive my spirit!' A complete collection of the extant works of Cranmer has been published at Oxford by Dr. Jenkyns.

(Strype's *Memorials of Cranmer;* Fox's *Acts and Mon.;* Burnet's *Hist. Reform.;* Gilpin's, Todd's, and Le Bas's *Lives of Cranmer.*)

CRAON. [MAYENNE.]

CRAPE is a light transparent fabric composed of silk, from which, by the mode of its preparation, all the gloss has been taken, and which, when dyed, as it usually is, of a black colour, is worn as a material for mourning-dresses. For thin crape, the only preparation which the filaments of silk undergo previous to the weaving is the simple twisting, which forms the first process of the throwing mill, and in which state the thread is technically called *singles.* When it is intended to make a more substantial fabric, the warp is made of two and sometimes three filaments twisted together, which in that state are called *tram:* the weft is still composed of singles. The wrinkled appearance of crape is produced by the application of a viscid solution of gum.

CRAPONNE. [HAUTE-LOIRE.]

CRASHAW, RICHARD, an English poet, was born at London, but in what year is uncertain. In early life he was placed upon the foundation at the Charter-House, whence, in March 1632, he went to Pembroke Hall, Cambridge, and took the degree of B.A. in 1634. He afterwards went to Peterhouse, of which he was a fellow in 1637, and became M.A. in 1638.

In 1634 he published a volume of Latin poems, mostly devotional. A second edition of his 'Poemata and Epigrammata' was published at Cambridge, 8vo, 1670.

At what time Crashaw was admitted into holy orders is uncertain, but he seems to have become a popular preacher. In 1644, when the parliamentary army expelled those members of that

university who refused to take the covenant, Crashaw was among the number; and he went over to France, where soon afterwards he embraced the Roman Catholic religion. In 1646 he went to Italy, and became secretary to one of the cardinals at Rome, and was made a canon in the church of Loretto, where he died about the year 1650. His 'Steps to the Temple, Sacred Poems, with other Delights of the Muses,' was published in 12mo., 1646; and other editions were afterwards published. Crashaw resembled Herbert in his turn of mind, but possessed more fancy and genius. In 1652 a posthumous volume of his poems was published at Paris, entitled 'Carmen Deo nostro, te decet Hymnus—Sacred Poems, collected, corrected, augmentcd, most humbly presented to my Lady the Countesse of Denbigh, by her most devoted servant R.C., in hearty acknowledgement of his immortall obligation to her goodness and charity,' 8vo. An edition of his English Poems, selected from the two volumes, was published by Peregrine Phillips, 12mo., London, 1785.

CRASSULA'CEÆ, a naturnl order of polypetalous Exogens. It consists of succulent plants, with herbaceous or shrubby, and annual or perennial roots, growing in hot, dry, exposed places, in the more temperate parts of the old world chiefly. On the sun-scorched cliffs and volcanic soil of the Canaries, and on the dry sterile plains of the Cape of Good Hope, they are most abundant. Their flowers are arranged in panicles, spikes, cymes, and corymbs.

Many species of *Crassula, Rochea, Sempervivum, Sedum,* &c., are cultivated for the beauty of their flowers; the various annual *Tillæas,* &c., are obscure weeds; and House-Leeks (different sorts of *Sempervivum*) are grown for their refrigerant qualities.

All the hardy species may be grown on old walls, roofs, rock-work, or other places thoroughly drained of moisture; the greenhouse kinds require to be potted in a mixture of lime rubbish, broken pots, and earth. In summer they are to be freely exposed to the weather in sunny situations without protection, and in winter they are to be kept moderately cool, and nearly without water.

CRASSUS, MARCUS LICINIUS, the son of P. Licinius Crassus, was probably born a little before 115 B.C. The first important event in his life was his appointment to take the command against Spartacus and the revolted gladiators of Capua. A battle was fought in the south of Italy, near Rhegium, in which Crassus was victorious, and Spartacus fell with 40,000 of his men. Crassus was rewarded with an ovation on his return. At the time of his expedition against Spartacus, he held the office of prætor; and the following year (71 B.C.), he was chosen consul with Pompeius. The influence which Pompeius gained by his popular manners Crassus succeeded in acquiring by his hospitality and munificence. On one occasion he gave a general entertainment to the whole people, and distributed corn enough for three months' provision. After some years, Crassus and Pompeius dropped their violence towards each other, and joined Cæsar in what is commonly called the first Triumvirate. While the actual power was almost entirely engrossed by Cæsar, he endeavoured to blind Crassus and Pompeius to his designs. He included them both in a commission for dividing the lands of Campania, and for settling a colony at Capua, and thus enabled them to provide for some needy adherents. After a time the alliance was discontinued, but it was renewed again; and in B.C. 56 Pompeius and Crassus offered themselves as candidates for the consulship, and were elected. Cæsar had been appointed over the province of Gaul for five years; and Crassus and Pompeius succeeded in gaining respectively the provinces of Syria and Spain for the same period. Crassus set out for Syria without delay, before the year of his consulate was expired, B.C. 55. From the great preparations which he made, and his known avarice, it was clear that a war with the Parthians was the real object at which he aimed. Crassus proceeded, by way of Macedonia and the Hellespont, to Asia. He plundered the temples of Syria and of Jerusalem, crossed the Euphrates, and ravaged Mesopotamia. Orödes, the king of Parthia, being at the time engaged in an invasion of Armenia, his general Surena commanded the Parthian forces against the Romans. Crassus imprudently led his troops into the desert, and a battle was fought near Carrhæ between Crassus and Surena, in which Crassus was defeated, and his son Publius lost his life. The clamours of his soldiers obliged him to accept proposals of peace from Surena, to whom the messengers of the Parthian general promised to lead him. His resistance to their insulting treatment provoked their fury, and they put him to death without delay, B.C. 53. Surena had his head and right hand cut off and sent to Orodes.

Crassus possessed no great talent, and, but for his wealth, he would probably have been scarcely known. His wealth was not acquired by the most honourable means. He is said to have enriched himself by purchasing at a very low price the estates of those who were proscribed by Sulla; also by letting for hire slaves, whom he had instructed in various arts and trades. Cicero ('Brut.,' c. 66) represents him as a man of moderate acquirements and slender abilities, but of great industry and perseverance.

(Appian, *on the Parthian Wars,* s. 134–155; Dion Cassius, xxxvi. and xxxvii.; Plutarch, *Life of Crassus.*)

CRASSUS, LUCIUS LICINIUS, was considered the greatest orator of his time. Cicero ('Brut.,' c. 38) pronounces him perfect, and in the treatise 'De Oratore' he delivers his own sentiments on eloquence in the person of Crassus. In the beginning of the third book he laments the untimely death of the interlocutors in the dialogue, Crassus and Antonius.

CRATÆ'GUS, an extensive genus of hardy trees and bushes, the different species of which are cultivated for the sake of their ornamental appearance, especially when loaded with brightly coloured fruit. It belongs to the pomaceous division of the rosaceous order, and is very nearly allied to the apple, from which it differs in the fruit containing a variable number of stones, as the

medlar does; from the medlar it is known by its fruit being closed; not spread open, at the apex.

The species inhabit woods and hedges throughout the northern hemisphere, from Barbary and Palestine to about 60° N. lat. on the eastern continents, and from Mexico to a similar latitude in the west. South of these limits they do not occur in America. The flowers appear in the greatest profusion, usually in terminal cymes, in the early months of the year, and are succeeded by small round fruits, coloured yellow, red, purple, or black. Most of them are merely haws, and fit only for the food of birds; a few are larger and more fleshy, but none of them have been found worth cultivating for the fruit, except the Azarole (*Cratægus azarolus*), which is eaten in Italy, and the Aronia, which is sold in the markets of Montpelier under the name of *Pommettes à Deux Closes.*

Between sixty and seventy well-marked species and varieties are known in the gardens of this country. Into extensive collections they are all worth introduction except *Cr. parvifolia* and those immediately allied to it; and for the ornament of park scenery there is probably no genus of flowering trees at all to be compared with Cratægus for variety, fragrance, and beauty.

Under the name of *Hawthorns* are comprehended all the numerous sorts which are either varieties of *Cratægus oxyacantha*, or nearly related to it. They have all deeply lobed rather shining leaves, so little hairy that their bright green colour is not deadened, small fragrant flowers, and small shining haws. They are distinguished for the graceful manner in which they generally grow in rich soil and unharmed by the pruning-knife.

Very nearly allied to these are the *Oriental Thorns*, species which have their deeply cut leaves covered so closely with hairs as to have a dull gray or hoary aspect, large fragrant flowers, and large succulent rather angular fruit. These are less graceful in their manner of growth than the true hawthorns, some of them, especially *Cr. tanacetifolia* and *odoratissima* having a round formal head; but their flowers are even more fragrant than the May-bush, and their fruit renders them striking objects in the autumn. The azarole is one of them; but it does not fruit or flower readily, and is the least worth having of the group.

The *Small-leaved Thorns* are all North American: they form small straggling bushes, and are not worth cultivation.

The *Evergreen Thorns* consist of *Cr. Mexicana* and *pyracantha*. The former is a small tree, with lance-shaped bright green leaves and large round yellow fruit; it is probably too tender for hardy cultivation north of London. The latter, an inhabitant of rocks and wild places in the south of Europe and the Caucasus, has so long been cultivated for the sake of its flame-coloured berries and evergreen leaves, as to require no description here.

All these plants may be budded or grafted upon the common hawthorn.

CRATÆVA, a genus of plants belonging to the natural order *Capparidaceæ*. *C. gynandra*, Garlic Pear, is a native of bushy places and thickets near the sea-side in Jamaica. The whole plant has a nauseous smell and a burning taste. The bark of the root is said to blister like cantharides. *C. Tapia*, the Tapia or Common Garlic Pear, is a tree about 20 feet high. Its fruit is the size of a small orange. It is brought both from the West India Islands and from South America. The fruit has the smell of garlic, and communicates its odour to animals that feed on it. The bark is bitter and tonic, and has been employed in the cure of intermittent fevers. *C. Mannelos*, the Bilva or Mahura, is a small tree bearing a large spheroidal berry with a hard shell, and cells which contain, besides the seeds, a large quantity of a tenacious transparent gluten, which on drying becomes very hard, but continues transparent; when fresh, it may be drawn out into threads of one or two yards in length, and so fine as scarcely to be perceptible to the naked eye, before it breaks. It is found in all parts of the East Indies. The fruit is nutritious and aperient, and very delicious to the taste.

CRATI'NUS, the son of Callimédes, a writer of the old comedy, was born at Athens 519 B.C. He was the most formidable adversary of Aristophanes: two occasions are recorded on which the judges pronounced him only second to that great poet; and in 423 B.C. the first prize was awarded to his comedy called the 'Wine-Flask,' the 'Clouds' of Aristophanes being placed third. He died the year after. Cratinus was highly esteemed by his countrymen, and at one time, according to his rival Aristophanes, was so much in fashion, that no songs were listened to at banquets except choruses from his comedies. In his old age he was much addicted to drinking. The names of forty of his comedies have been preserved. (Fabricius, *Bibl. Græca*, ii. p. 431.)

CRATIPPUS, a Peripatetic philosopher, born at Mityléne. He was a contemporary and friend of Cicero, who thought him the first philosopher of the age, and intrusted his son Marcus to his care at Athens. ('De Officiis,' i. 1.) He taught first in his native place, where he was still residing when Pompeius came thither after the battle of Pharsalia; he had an interview with the defeated general, with whom he conversed on providence. Afterwards he went to Athens, and Cicero not only got him made a Roman citizen by C. Julius Cæsar, but even prevailed upon the Areópagus to vote that he should be requested to continue at Athens as an instructor of youth. Brutus heard Cratippus at Athens while engaged in preparations to meet the army of the Triumvirate. Cratippus wrote a treatise on divination, in which he allowed that kind which was derived from dreams and the ravings of idiots, but denied all other sorts of divination. He was an amusing companion, and gifted with great powers of conversation. (Cicero, *ad Familiares*, xvi. 21.)

CRAU, DESERT OF. [BOUCHES-DU-RHÔNE.]

CRAWFISH. [ASTACUS; CRUSTACEA.]

CRAYER, CASPAR DE, a Flemish historical painter, was born at Antwerp in 1582, and was instructed by Raphael, the son of Michael Coxie,

He first distinguished himself at Brussels, where he painted several altar-pieces, but he settled eventually at Ghent, where his greatest works are still preserved in the museum and in various churches: many of his works are however scattered over Germany and the Netherlands. He died at Ghent in 1669.

CRAYONS (from the French *crayon*, derived from *craie*, chalk) are a species of material for drawing. Black chalk, found in Italy, white chalk, found in France, and red chalk form three of the best varieties of crayons: each has its own peculiar value as a drawing material. Artificial crayons are composed of different-coloured earths, and other pigments, rolled into solid sticks with some tenacious stuff such as milk, common gin, or beer-wort; the best are procured from Switzerland. The native crayons are the legitimate materials for the artist in the study of drawing, and in tracing the first thoughts of design. Some of the sketches of Raphael, Michel Angelo, the Caracci, and others of the great painters are in this material.

An instrument called a porte-crayon is employed to hold the crayon. It is a metal tube, split at each end, so as to admit the crayon; a sliding ring embraces the tube, and assists in retaining the crayon. A stump made of leather, cork, or paper, closely rolled, or cut into a short round stick, more or less sharply pointed at each end, is used to soften and spread the chalk or crayon in the shaded parts of the drawing.

CREAM. [BUTTER.]

CREASOTE or KREASOTE is a fluid compound of oxygen, hydrogen, and carbon, obtained by Reichenbach. This substance exists in crude pyroligneous acid, but it is best prepared from that portion of the oil distilled from wood-tar which is heavier than water. It is a colourless transparent fluid, and has a strong odour which greatly resembles that of smoked meat, with a caustic and burning taste. It is highly antiseptic, and combines both with acids and with alkalis; but it is decomposed by strong nitric and sulphuric acid.

Creasote coagulates albumen, even when much diluted, and it also coagulates serum. Meat and fish are preserved after having been brushed over with creasote and dried in the sun; the antiseptic power of pyroligneous acid and wood-smoke is supposed to be derived from its presence. A few drops added to ink are said effectually to prevent its becoming mouldy.

Medical Properties.—Chemical analysis shows this compound to contain a very large proportion of carbon; which circumstance, along with other peculiarities, renders it in certain cases a valuable medicine, and in other cases a formidable poison. The introduction, by its means, of a large quantity of carbon into the body produces all the bad effects which an excess of that principle in the animal system is known to occasion; while, in certain morbid states of the system, this increased quantity of carbon produces the remarkable sedative effect which has followed its use. Independently of its general action on the system when taken internally, it produces, when concentrated, a local effect on the part to which it has been applied. Dropped upon the tongue, it causes violent pain; and unless largely diluted it cannot be swallowed, as, independent of the pain, it coagulates the albumen of all the fluids with which it comes in contact. Fibrine, carefully separated from other principles, is not affected by creasote.

A few drops of a very dilute solution of creasote taken into the stomach causes a sensation of warmth, and if repeated at short intervals, or the dose gradually increased, giddiness and other signs similar to those of intoxication are experienced. In larger doses it has all the effects of a narcotico-acrid poison. Animals, fishes, and insects, plunged into creasote water, speedily die with strong convulsions. Even plants watered with it perish.

Creasote has been recommended as a remedy in very many diseases, in few of which will it ultimately be found useful. Vomiting, including sea-sickness, some forms of bronchitis, cutaneous diseases, and hæmorrhage, either spontaneous or from wounds, are the only cases in which it has a claim to confidence. Creasote possesses great influence over external ulcers when it can be applied sufficiently strong to coagulate the albumen, and so form an artificial skin, under which the healing process goes on kindly. Thus in porrigo, especially ringworm of the scalp, and psoriasis, it is unrivalled. But poisoning has resulted even from its external application. Its power of coagulating the albumen of the blood renders it a most valuable styptic, and it may be employed to stop the bleeding mouths of even the largest arteries, such as the carotid, during surgical operations, or the flow of blood from leech-bites. In case of poisoning by creasote, moderate venesection and artificial respiration may be employed; the latter should be continued till by the operation of the lungs, the liver, and the kidneys, the system can free itself from the hurtful excess of carbon.

CREBILLON, PROSPER JOLYOT DE, was born at Dijon in 1674. He was sent by his father to Paris to study the law, under a person named Prieur, who, observing in Crebillon strong marks of a poetic genius, urged him to try his powers on a tragedy. After failing in his first attempt, the tragedy of 'Idomené' was produced in 1707, and was successful. In the same year appeared his second piece, called 'Atrée;' but it was by the production of 'Rhadamiste,' in 1711, that Crebillon's fame rose to its height, and it is on this piece that it chiefly rests. After the production of this piece, Crebillon did not much increase his reputation by those of 'Xerxes' in 1714, 'Semiramis' in 1717, or 'Pyrrhus' in 1725. After this last piece, domestic afflictions and pecuniary difficulties prevented him from producing any other drama for twenty-two years; at which time the king settled on him a pension of 1000 francs, at the instance, it is said, of Madame de Pompadour, who supported Crebillon as the dramatic rival of Voltaire. Crebillon then wrote 'Catilina,' which was produced in 1745, and was received with great favour on its representation, but when it appeared in print the applause was by no means general. 'Le Triumvirat' was produced when the author was eighty-one years of age, and had but indifferent success; he also begun another tragedy,

called 'Cromwell,' about this time, which was never completed.

Crebillon died in the year 1762, and a monument was erected to his memory in the church of St. Gervois, at Paris.

CREBILLON, CLAUDE PROSPER JOLYOT DE, son of the preceding, was born at Paris in 1707. He wrote a number of romances, which acquired a great popularity, owing, as some say, more to their extreme licentiousness than to any intrinsic merit. But the fact is, that his novels, in spite of their outrageous indecency, contain a most accurate picture of the motives that actuate persons in a corrupt state of society. They are rather the works of a cynic, who tears the mask off vice, than of a voluptuary who is absorbed in its contemplation. Only those whose minds are unassailable by impurity can peruse with any profit the novels of Crebillon.

CRECY. [SOMME.]

CREDENTIALS are the instruments which an ambassador or other diplomatic minister receives from his own government, and which authorise him to appear in his diplomatic character, and define the extent of his powers. The credentials are usually in the form of a closed letter, addressed to the power to which the minister is sent; but ministers are sometimes accredited by letters patent.

A minister will not be received in any other character than that which is given him by his credentials; and for this reason he usually communicates their contents before he is admitted to his first audience. If he is accredited by letters patent, this is done by showing the instrument itself; but, if his credentials are sealed, then by presenting a copy of them. [AMBASSADOR.]

CREDI, LORENZO DI, a Florentine painter and sculptor, was born at Florence about 1453. His real name was, according to Vasari, Lorenzo Sciarpelloni, and he acquired the name of Credi from his master, a distinguished goldsmith at Florence at that time. After leaving Credi, Lorenzo entered the school of Verrocchio, in which he was the fellow-pupil of P. Perugino and of Lionardo da Vinci.

It is not enough to say that Lorenzo di Credi was a good painter for his time: he was an excellent painter for any time. His Birth of Christ, now in the gallery of the Academy at Florence, is one of the best works in that excellent collection. His best work however is the picture of the Madonna and Child, with Saints Julian and Nicolas, painted for a chapel of the Convent of Cestello, but at present in the Louvre at Paris, No. 958, and in excellent preservation. Credi, when old, having become wealthy by his labours, retired into Santa Maria Nuova at Florence, and was still living in 1536, but ill and bed-ridden.

CREDIT is that part of a contract by which one man, to whom money is due, agrees that the debtor shall pay at a future time. The man who trusts or lends is said to give credit, and he who is trusted is said to obtain it. The one is called a creditor, and the other a debtor.

Credit is given either in goods or in money. By the former mode goods are supplied to a purchaser, for which the payment is deferred for some fixed period, or indefinitely, and the person who supplies them indemnifies himself for the delay by an increased price. By the latter mode, money is advanced, upon security or otherwise, and interest is charged upon the loan. Both these modes are used, in conjunction with each other, in the large transactions of commerce. A manufacturer, for example, sells to a merchant, for exportation, goods to the value of a thousand pounds. The merchant however is unable to pay for them until he has received remittances from abroad; and the manufacturer, aware of his solvency, is contented to receive in payment a bill of exchange due at some future period. But in the meantime he is himself in need of money to carry on his business, and, instead of waiting for the payment of the bill when it shall become due, he gets it discounted by a banker or other capitalist. Thus, having given credit to one person in goods, he obtains credit from another in money. In this and other ways capital is circulated and applied to the various purposes for which it is required.

There can be no system of credit until there has been a considerable accumulation of capital; for, when capital first begins to be accumulated, those who possess it apply it directly in aid of their own labour. As a country increases in wealth, many persons acquire capital which they cannot employ in their own business, or can only employ by offering inducements to purchase in the shape of deferred payments. As soon as a sufficient capital exists, a system of credit has a natural tendency to arise, and will continue to grow with the increase of capital, unless it be checked by a general insecurity of property, by imperfect legal securities for the payment of debts, or by a want of confidence in the integrity of the parties who desire to borrow. When the society and laws of a country are in a sound state, and capital is abundant, credit comes fully into operation.

The precise use of credit as an agent in the production of wealth is that it gives circulation to capital, and renders it available wherever it can be most profitably employed. It does for capital what division of employments does for labour. Without augmenting its quantity, it increases its utility and productiveness. Credit, in fact, may be best understood by regarding it as one of the many forms in which the division of employments facilitates the production of wealth. Without the aid of capital, the labour of man is comparatively ineffectual; and credit, by circulating capital among those who are engaged in the productive employment of labour, promotes the most essential of all divisions of industry—that which uses and makes effective the ingenuity of men in those pursuits for which they are adapted. As one of the forms in which capital is distributed, a system of credit is of the highest value; but, if relied on as an independent equivalent of capital, it is delusive or fraudulent.

That description of credit which consists in a deferred payment for goods is a valuable auxiliary to capital and industry; but, whenever it is injudiciously given or accepted, it becomes injurious. In this respect it does not differ from other forms of credit. In whatever form credit is judiciously

and honestly applied, it is an efficient agent in the circulation and productive use of capital; but, whenever it is used without judgment or fraudulently abused, it becomes injurious, and wastes capital instead of encouraging its growth. All great means conducive to social good are, unhappily, liable to perversion and abuse. The public credit of nations and mercantile credit have too often been abused, and the system of tradesmen's credit has also been shamefully perverted; but all alike are conditions inseparable from the application of capital to the infinite purposes for which it is required. The advantages of credit are so great that it will always be extensively used in every form of which it is susceptible.

CREDIT, LETTER OF, is an order given by bankers or others at one place, to enable a person to receive money from their agents at another place. The person who obtains a Letter of Credit may proceed to a particular place, and need only to carry with him a sum sufficient to defray his expenses; and it gives him some of the advantages of a banking account when he reaches his destination, as he may avail himself of it only for part of the sum named in it. A Letter of Credit is not transferable.

CREDITON. [DEVONSHIRE.]

CREECH, THOMAS, the translator of Lucretius, Horace, Theocritus, and detached portions of several other Greek and Latin authors, was born at Blandford, in Dorsetshire, in 1659, admitted of Wadham College, Oxford, in 1675, and elected probationer-fellow of All Souls' in November, 1683. He published in 1682 his translation of Lucretius; a Latin edition of the same author in 1695; and a translation of Horace in 1684, the latter with very indifferent success. He was appointed to the college living of Welwyn, Herts, in 1699; and two years afterwards, in June, 1701, he hung himself in his chamber at Oxford.

CREED, from the Latin *credo* (I believe), the English name for those short summaries of Christian doctrine which in the continental churches are commonly called symbols, though sometimes also credos. The English Church adopts the three ancient Creeds, called the Apostles' Creed, the Athanasian Creed, and the Nicene Creed; but it does not assert any of them to be inspired. The Catholic Church adopts along with these what is called the creed of the council of Constantinople, which contains some addition to what is said in the Nicene Creed on the subject of the divinity of the Holy Ghost.

CREEK is a small inlet on a low coast. Such inlets occur also frequently in harbours inclosed by a low shore and along the banks of rivers. Sometimes creeks are formed by the mouths of small brooks and rivulets. In the United States the name creek is very generally applied to small inland streams, which in England would be called brooks or rivers.

CREEK INDIANS. [NORTH-AMERICAN INDIANS.]

CREEPER (*Certhia*). The Creepers (*Certhiadæ*) constitute a family of birds placed by Cuvier and the Prince of Canino among the tenuirostral section of the Passerine order; on the other hand, Mr. Vigors and Mr. Swainson refer this family to the Scansores; the former ornithologist regarding it as a link between the woodpeckers (*Picidæ*) and the tenuirostral group, viz. Honey-Suckers, Honey-Eaters, Sun-Birds, and Humming-Birds.

The Creepers are birds structurally adapted, by means of their large feet and strong claws, for climbing about the trunks of trees, or the precipitous faces of rocks or steep banks, in quest of food. The toes however are not zygodactyle as in the woodpecker, nor is the tail universally composed of rigid pointed feathers. In general the beak is elongated, sometimes straight, generally more or less arched and slender. The food consists of insects and their larvæ.

Genus *Certhia*.—Bill moderately long, curved, triangular, compressed, slender, and pointed; nostrils basal, partially closed by a membrane; wings short; tail-feathers stiff, a little curved and pointed at the end.

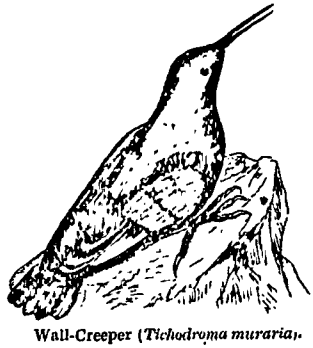
Example. — The Common Creeper or Tree Creeper (*Certhia familiaris; Le Grimpereau* of the French; *Picchio Piccolo* of the Italians; *Baumlaufer* and *Kleinere Grau-Specht* of the Germans; *Krypare* of the Fauna Suecica.)

Tree-Creeper (*Certhia familiaris*).

The Creeper is a restless active little bird ever on the alert, and common in groves and orchards, where it may be observed spirally running up the stems of trees like a mouse, and using the sharp shafts of its tail as a prop or aid in its ascent; it is searching for food, and if narrowly watched may be seen probing with its bill into the chinks of the bark, whence it extracts its insect prey. Having ascended the stem, and finished its examination, it does not attempt to descend, but flits off to an adjacent tree, and again commences its scrutiny. Its note is monotonous, and often repeated. The Creeper makes its nest in a hole or behind the bark of decayed trees; it is formed of grass and the fibres of bark, and lined with feathers. The eggs are six or eight in number, and the female, while she sits on them, is regularly fed by her mate. This species is common in our islands and on the continent of Europe. A distinct species (*Certhia Natterri*, Bonap.) is found in Dalmatia; and another (*C. Americana* Bonap.), long regarded as identical with our British Creeper, tenants the northern and western parts of America.

Genus *Tichodroma* (*Petrodroma*, Vieillot).—Bill longer than the head, triangular at the base, and depressed at the point; nostrils horizontal; tail-feathers nearly equal, not rigid; wings long.

Example.—The Wall-Creeper (*Tichodroma phœnicoptera*, Temm.; *T. muraria*, Bonap.; *Grimpereau de Murailles* and *Echelette* of the French; *Picchio muraiolo* of the Italians; *Mauer Baumlaufer* of the Germans). This elegant bird is a native of the mountain districts of middle and southern Europe. There it tenants the loftiest crags, and the hoary ruins of castles and other buildings which top the frowning heights of Alpine scenery. It does not creep, mouse-like, as does our creeper up the bark of trees, but flits from point to point over the vertical surfaces of precipitous rocks, securing itself by its claws, which are remarkably powerful. Hence the absence of the stiff springy shafts in the feathers of the tail. Spiders are a favourite food.



Wall-Creeper (*Tichodroma muraria*).

The Wall-Creeper breeds in the fissures of inaccessible precipices, or the crevices of ruins. General colour, delicate gray, the shoulders and larger wing-coverts being lively crimson, as are the outer edges of the larger quill-feathers; rest of the quill-feathers and tail black, obscurely tipped with white. In the male, during the spring, the throat acquires a deep black colour, lost at the autumnal moult. Length, 6½ inches.

Genus *Dendrocolaptes* (*Dendrocopus*, Vieillot).—Bill long or moderate, compressed laterally, rather strong, convex, straight, or curved; nostrils round, and lateral; tail-feathers stiff and pointed; claws very much curved and channelled.

Example.—The Curve-Billed Creeper (*Dendrocolaptes procurvus*). The strong claws and spine-shafted tail of this species sufficiently indicate its scansorial habits. It is a native of the forests of Brazil. In size it equals a common blackbird. The general colour is cinnamon brown, with a tinge of gray about the head, which as well as the neck is freckled with white. We have no explicit details respecting its history. The genus *Dendrocolaptes* is divided into several subgenera, and the present bird forms the type of that termed *Xiphorhynchus*.

Genus *Climacteris*.—Bill short, feeble, and somewhat curved; feet very robust, with strong curved claws; external toe united as far as the second articulation; internal toe as far as the first; wings moderate.

Example.—Of this genus two species were formerly known (*C. Picumnus*, and *C. scandens*). Mr. Gould has added two new ones. All are natives of Australia. They are excellent climbers, traversing the hollow limbs or sprouts, as they are termed, of aged Eucalypti, and the rugged bark of decayed trees, in quest of insects, on which they prey. They incubate in the holes of trees, and the eggs are white. The *C. Picumnus* is a native of the north coast of Australia, Timor, and Celebes. Length, about 6 inches. We may remark that this genus holds a very doubtful place among the *Certhiadæ*.

Genus *Furnarius*.—The genus *Furnarius* includes several species which have a very doubtful place among the *Certhiadæ*. Mr. Darwin says, in his notice of the Birds of Bahia Blanca, with respect to the genus in question, that it contains several species of small birds living on the ground, and inhabiting open dry countries. In structure they cannot be compared to any European form. Ornithologists have generally included them among the Creepers, although opposed to that family in every habit.

Example.—The Oven-Bird (*Furnarius rufus*). This species, known to the Spaniards of La Plata as the *Casara*, or House-Maker, is so called from its nest, which 'is placed in the most exposed situations, as the top of a post, a bare rock or cactus; it is composed of mud, and bits of straw, and has strong thick walls; in shape it precisely resembles an oven or depressed bee-hive; the opening is large, and arched, and directly in front; within the nest there is a partition which reaches nearly to the roof, thus forming a passage or antechamber to the true nest.' (Darwin.) Mr. Darwin, mentions another species of *Furnarius* called *Casarita*, or Little House-Builder, and also the *Furnarius fuliginosus*, which lives on the beach of the Malouine Islands, and feeds on small sea-worms, shrimps, &c. It is very evident that these birds are not Creepers; and the same observation applies to the genera *Cœreba* [Sun-Birds], and *Dicæum*, with several others, which by various naturalists have been unwarrantably placed within that family. Among these we may mention *Melithreptus*, of which one species (*Certhia vestiaria*, Shaw) affords the beautiful red feathers with which the natives of the isles of the southern ocean covered their cloaks, helmets, and other articles of dress or ornaments.

CREES. [North-American Indians.]

CREFELD, a town in the government of Düsseldorf in the Prussian Rhein-Provinz, stands in 51° 20′ N. lat., 6° 32′ E. long., 15 miles N.W. from Düsseldorf, and has 30,000 inhabitants. It is well and regularly built, and, being encircled by gardens and country-seats, is one of the prettiest spots in this part of Germany. The town contains a Roman Catholic church, two Protestant churches, a synagogue, an orphan asylum, hospitals, and a house of correction. It is a place of great manufacturing activity; the principal fabrics are silks and velvets, which are woven chiefly by hand, and give employment to 6000

workpeople. The articles of manufacture are calicoes, woollens, tape, ribands, linen, hosiery, glass, refined sugar, soap, iron and copper wares, &c. The trade of Crefeld is brisk and extensive; its growing prosperity may be inferred from the increase in its population since 1825, when it had only 16,325 inhabitants. (Banfield's *Manufactures of the Rhine.*)

CREIL. [OISE.]

CREMA. [LODI.]

CREMNITZ, a mining-town in the county of Bars, in Hungary, is situated in a narrow valley, closed in by seven high hills, in 48° 42′ N. lat., 18° 53′ E. long., and has 10,000 inhabitants, who derive their subsistence chiefly from the adjacent gold and silver mines. It is the place where the earliest mines in the kingdom were opened. The town is the seat of a board of mines; it has a mint, in which the Cremnitz ducats are coined; two paper-mills; and a manufactory of earthenware and of red lead.

CREMONA, a province of Lombardy, is bounded N. by the Oglio and the province of Brescia, E. by the Chiese and the province of Mantua, S. by the Po, which divides it from the duchy of Parma, and W. by the Adda, which separates it from the province of Lodi. Its greatest length is about 45 miles, and its breadth about 15; it contains 480 square miles, and has a population of 188,000. The surface is level, and the soil very fertile, yielding wheat, rice, maize, wine, oil, and flax. The white mulberry-tree is extensively cultivated for the production of silk. Cheese, wax, and honey are important articles of produce. Horses, horned cattle, and pigs are numerous. Although great facilities exist for irrigating the grounds, in consequence of the Po and the Oglio flowing within embanked channels considerably above the level of the adjacent soil, yet the system of irrigation does not prevail nearly to such an extent as in the Milanese. The chief manufactured fabrics are silks, calicoes, and linen; cream of tartar is prepared. The embankments of the Oglio and the Po require constant vigilance, and are kept in repair at considerable expense, in order to prevent the disasters that would occur from the inundations to which these rivers are subject. The principal towns, besides CREMONA, are—Casal Maggiore, on the left bank of the Po, a place of some commercial importance, with a population of 5000; Pizzighettone, a strong fortress on the Adda, which has a population of 4000; and Castelleone, in the north-west of the province, which has 4000 inhabitants. Education is universally diffused among the people of Cremona.

CREMO'NA, the capital of the province of Cremona, and a bishop's see, 45 miles south-east of Milan, is situated on the north bank of the Po, and surrounded by walls flanked with towers and wet ditches. A navigable canal, which joins the Oglio to the Po, passes through the town. The city, which is well built with regular and wide streets, is 5 miles in circumference, and has a population of 30,000. Cremona has many good buildings, such as palaces and churches, all of which are profusely adorned with frescoes and paintings by native artists, the most noted of whom are Boccacino and Campi. The façade of the Duomo, or cathedral, (which is a Gothic building), is ornamented with curious sculptures representing the signs of the zodiac and the rural labours of the various seasons. The other remarkable churches are those of San Nazario, San Pietro, San Abbondio, San Lorenzo, Santa Pelagia, Santa Agata, and Santa Margherita, which last was built under the directions of the celebrated prelate Jerome Vida. The town-house on the great square, the Campo Santo near the Duomo, the new market, the theatre, and some of the gates of the town are worthy of notice. But the famous Torazzo, or belfry, surmounted by a spire, which is close to the Duomo, yet detached from it, and one of the loftiest towers in Italy, is the wonder of Cremona: there are about 500 steps to ascend up to the bells. About one mile outside of the town is the fine church of San Sigismondo. Cremona has civil, criminal, and commercial courts, a lyceum, a gymnasium, a school of the fine arts, and several infant schools.

Cremona carries on a considerable trade in agricultural produce by means of the Po, and the various canals communicating with that river. It has considerable manufactures of silks, cottons, porcelain, earthenware, and chemical products. Its trade in corn, cheese, oil, honey, wax, silk, flax, &c. is considerable. The town was formerly celebrated for its violins and strings for musical instruments. A large fair is held in the town at the end of September each year.

Cremona was in the territory of the Galli Cenomani. It was colonised by the Romans at the time when Hannibal was marching against Italy. (Tacitus, 'Hist.,' iii. 34.) In the civil wars of the triumvirate it was plundered by the soldiers of Octavianus. In the war between Vitellius and Vespasian, the victorious army of the latter plundered and burnt the city. (Tacitus, 'Hist.,' iii.) It was restored by Vespasian. After the fall of the empire, it underwent the same vicissitudes as the other cities of Lombardy: it suffered severely at the hands of Frederic Barbarossa, was afterwards distracted by the Guelf and Guibeline factions, and at last fell under the dominion of the Visconti of Milan.

(F. A. Zacharia, *Cremonensium Episcoporum Series, cum Dissertatione de Cremonæ Origine, Amplitudine, &c.*, 4to., 1749; *Cremona Literata*, 2 vols. fol., 1702-6.)

CREMONA. [VIOLIN.]

CRENILA'BRUS (Cuvier), a genus of fishes of the section *Acanthopterygii* and family *Labridæ*. The species of this genus have all the characters of the true *Labri* or *Wrasses*, but are distinguished by having the margin of the preoperculum denticulated; the cheeks and operculum are scaly. Mr. Yarrell describes four British species—the Gilt-Head, Connor, or Golden Maid (*Crenilabrus tinca*); the Goldfinny or Goldsinny (*Crenilabrus cornubicus*); the Gibbous Wrasse (*Crenilabrus gibbus*); and the Scale-Rayed Wrasse (*Crenilabrus luscus*). (*History of British Fishes*, vol. i. p. 293, et seq.)

CREOLES, a Spanish word used to designate the children and descendants of European parents, who were born in the South American or West Indian Colonies, as distinct from the resident in-

habitants born in Europe, as well as from the offspring of mixed blood, such as the Mulattoes and Mestizoes, born of negro or Indian mothers.

CREOSOTE. [CREASOTE.]

CREPIDO'PTERIS, a genus of fossil ferns, which Presl substitutes for *Pecopteris* of Brongniart, in the case of two species, one from Stuttgardt, the other from Newcastle.

CREPIS, a genus of plants belonging to the natural order *Compositæ*. Most of the species of this genus are common weeds in the hedges of Europe. Five of them are natives of Great Britain.

CREPUSCULA'RIA (Latreille), a section of lepidopterous insects corresponding with the genus *Sphinx* of Linnæus. These insects occupy an intermediate station between the *Lepidoptera diurna*, or butterflies, and the *Lepidoptera nocturna*, commonly called moths. The families contained in this section are the *Sphingidæ*, *Sesiidæ*, *Ægeriidæ*, and the *Zygænidæ*.

CRE'PY. [OISE.]

CRESCENTIA, a genus of plants belonging to the natural order *Solanaceæ*. The species are large spreading trees, with solitary flowers rising from the trunk or branches.

C. Cujete, Cujete or Common Calabash-Tree, is a native of the West India Islands and Spanish Main. It is a tree about twenty feet high, and is readily distinguished from all others by its habit. The form and size of the fruit is very variable, being from two inches to a foot in diameter. It is covered with a thin skin, of a greenish yellow colour when ripe; and under this is a hard woody shell which contains a pale yellowish soft pulp, of a tart unpleasant flavour, surrounding a great number of flat seeds. The shell is of great use to the inhabitants; the smaller oblong ones are formed into spoons and ladles, the larger ones form drinking cups, basins, and bowls for every variety of domestic purposes. There are three or four other species, natives of the West Indies and South America, having the same general characters as the above.

CRESPI, GIUSEPPE MARIA (Cavaliere), a painter and engraver of Bologna, was born at Bologna in 1665. He was the scholar of Canuti and of Cignani, and was called Lo Spagnuolo on account of his gay attire. He had a surprising facility of execution: indeed he is in this respect probably unequalled. There are twelve of his works in the gallery of Dresden, including the Seven Sacraments, painted for Cardinal Ottoboni; and an Ecce Homo, which, with all its faults, is a most masterly performance. Crespi died in 1747.

CRESS, the name given to various plants with acrid or pungent leaves. Common Cress is *Lepidium sativum*; Water-Cress, *Nasturtium officinale*; Belleisle or Normandy Cress, *Barbarea præcox*; Indian Cress, *Tropæolum majus*.

CRESSY, or CRE'CY. [SOMME.]

CREST, from the Latin *crista*, the ornament of the helmet, a term in Heraldry sometimes used for the helmet itself. The principal application of crests was in jousts or hastiludes, when the shield was not borne, but where they afforded an equal distinction; or by the chief commanders of horsemen in the field of battle. Originally conceded by royal grant, and confined to very few persons, in process of time the assumption of them has become universal. They are not held to be absolutely hereditable, but may be assumed; and as females could not avail themselves of their primary use, accordingly no woman is allowed to bear a crest.

CREST. [DROME.]

CRETA. [CANDIA.]

CRETACEOUS GROUP, in Geology, consists of the upper strata of the secondary series, immediately below the tertiary series and superincumbent on the Wealden, or, where that is wanting, on the oolitic system. This group is common to Europe, and also to a part of Asia. It is subdivided into the following strata:—

Chalk	Upper Lower Marly	In which numerous species of marine fossils are found.
Green-Sand	Upper Green-Sand Gault Lower Green-Sand	

The Cretaceous Group occupies nearly the whole of the south-eastern part of England.

The *Chalk*, or upper portion of the system, is in some parts covered with the strata of the tertiary series; in other parts it is denuded. The Green-Sand crops out round its edge, which is broken and interrupted in many places where the lower strata appear. On the N.E. the chalk appears in a narrower belt along the cliff from near Cromer to Hunstanton. From Cromer along the coast to the mouth of the Thames, and along the north bank of that river, it is concealed by the upper strata, which extend a considerable distance inland. The boundary line between the chalk and the superior strata runs pretty nearly by way of Diss, Bury St. Edmund's, Hertford, St. Alban's, and Wendover; it then extends westward and southward by Maidenhead, Reading, Newbury, Marlborough, Kingsclere, Basingstoke, Guildford, Dorking, and then round into Kent.

In many of these places the chalk is denuded and appears on the surface; while in others it is lightly covered by tertiary strata. Along the southern coast the chalk is, for the most part, hidden. It is visible however in the Isle of Thanet, at Deal and Dover, in the Sussex South Downs, in the Surrey North Downs, in the Isle of Wight, and at a few other spots. In some places the Green-Sand forms lofty cliffs and hills. The internal ridge or boundary of chalk, from Dorsetshire to Norfolk, extends by way of Crewkerne, Stourhead, Pewsy, Warminster, Dunstable, Hitchen, Baldock, Royston, Newmarket, Mildenhall, Brandon, and Snettisham. The portion between Dorsetshire and Bedfordshire is interrupted by three or four indentations or gulfs; one of great width, opening towards the west between Crewkerne and the heights about Stourhead, in South Wiltshire; another expanding to the north-west, and terminating in the defile where the Thames cuts through the chalk. The vales of Pewsy and of Warminster are intermediate bays of the same general structure, but of smaller dimensions; and all these valleys are apparently the result of denudation, aided by previous disturbance of the

strata, which has carried away the chalk and laid bare to various depths the strata beneath it.

The chalk inland range is highest towards the central part between Wiltshire and Hertfordshire. In departing from that central tract, the rise is comparatively small both towards Devonshire on the south, as well as in the counties northwards. The chalk nearly disappears in Devonshire, a few insulated portions only appearing there. In many parts of the chalk range, the upper and lower strata are well defined even by the outward features, a marked difference appearing in the vegetation and general aspect. The upper chalk has usually layers of flint nodules occurring at regular intervals, and is softer than the lower chalk. The *Malm Land*, remarkable for its fertility, is the soil over the lowest beds of marly chalk. The *Malm Rock*, immediately below the marly chalk, consists of stony beds belonging to the upper green-sand formation. Salisbury Plain, which is more than twenty-five miles in extent from west to east, and twelve miles from north to south, is occupied by the upper chalk. In the tracts occupied by the lower chalk, and still more in the chalk marl, there are few valleys without streams; hence, as well as owing to the difference of soil, the vegetation differs also, and the luxuriance of the lower regions affords a strong contrast to the barrenness of the higher downs. From various measurements which have been made at Beachy Head, Dover, Wendover, Diss, and other places, it is computed that the entire thickness of the chalk varies from 600 to 1000 feet on an average.

The organic remains in the chalk are usually very abundant, and are mostly marine. They consist of marine plants, lamelliferous and cellulifer ous corals and sponges, Asteriadæ, Crinoidea, and Echinida, mesomyonous and brachiopodous Conchifera, phytiphagous and cephalopodous Mollusca, Crustacea, Fishes, Mososaurus, Chelonia. Sir H. De La Beche observes, 'Organic remains are in general beautifully preserved in the chalk; substances of no greater solidity than common sponges retain their forms, delicate shells remain unbroken, fish even are frequently not flattened, and altogether we have appearances which justify us in concluding that, since these organic exuviæ were entombed they have been protected from the effects of pressure by the consolidation of the rock around them, and that they have been very tranquilly enveloped in exceedingly fine matter, such as we should consider would result from a chemical precipitate.' ('Researches in Theoretical Geology,' p. 349.)

Green-Sand. The general position of this stratum has been sufficiently indicated in describing the boundary of the chalk, the former outcropping round the latter in an uneven line, in some places much wider than in others. Like the chalk itself, it is occasionally denuded, and at other spots covered with what may be termed accidental layers. The Fire Stone of Godstone occurs in the *Upper Green-Sand.* The Black Down Hills, in Devonshire, are composed of Green-Sand. The lower beds of Green-Sand form the tops of the hills all the way from Shaftesbury along the south side of the Vale of Wardour. The town of Devizes stands upon a platform of the Upper Green-Sand. The Upper Green-Sand is mostly composed of gray calcareous marl, resembling the lowest chalk, but so thickly interspersed with green particles as to entirely assume their colour. The green particles, according to analysis, are found to consist of—

Silica	48.5
Black Oxide of Iron . . .	22.0
Alumina	17.
Magnesia	3.8
Water	7.
Potash	traces
	98.3

The stratum called *Gault*, intervening between the Upper and the Lower Green-Sand, is of two different kinds as to composition. The upper part, immediately succeeding the Upper Green-Sand, contains green particles, and thence for some feet downwards it is harsh and sandy. The lower portion consists of a smooth, uniform, very plastic clay, of a light blueish colour, which is used for tiles and common pottery. Throughout the gault, but chiefly in the lower part, concretions of iron pyrites are found, and other nodules and irregular masses. It appears at the surface in many places; and near Folkstone it forms the greater part of some of the cliffs.

The *Lower Green-Sand* occupies a much larger surface area than the upper or the gault. It is extensively quarried for building near Ashford and other places, where it forms the 'Kentish Rag.' In many places it yields beds of fuller's earth. This Lower Green-Sand is of three different kinds. The first of these subdivisions consists principally of sand, white, yellowish, or ferruginous, with concretions of limestone and chert. It commonly forms a flat, but sometimes an irregularly hilly surface rising from the valley of the gault; it bears a dry barren soil. The second group contains an abundance of green matter and comparatively little stone; it is retentive of moisture, and occupies a flat and marshy tract. The third and lowest group contains more calcareous matter than the upper divisions. The thickness of the Lower Green-Sand varies from 30 to 400 feet. The organic remains in the Green-Sand are very similar to those in the chalk.

There are cretaceous groups of some extent in Lancashire and Yorkshire.

CRETINS, the name given in the Valais and other Alpine valleys to certain individuals who are more or less idiots, and most of whom have large swellings on their necks called goîtres. The goître or wen is not however always a necessary sign of crétinism. Many have goîtres without being crétins or idiots; and some crétins, it is said, have no goîtres; but the latter fact seems doubtful, or at least rare. The goîtres are of all sizes, from that of a walnut to the size of a quartern loaf. [BRONCHOCELE.]

CREUSE, a department in France, formed out of the Pays-de-Combrailles, Haute-Marche, and small portions of Limousin and Berri, is bounded N. by the departments of Indre and Cher, N.E. and E. by those of Allier and Puy-de-Dôme, S.

by the department of Corrèze, and W. by that of Haute-Vienne. It extends from 45° 39′ to 46° 26′ N. lat., and from 1° 24′ to 2° 36′ E. long.; its length from N.W. to S.E. is 68 miles, from N.E. to S.W. 50 miles, and the area is 2156 square miles. The population in 1841 was 278,029, which gives 128.95 to the square mile, being 39.05 below the average per square mile for all France.

The department is almost entirely covered with mountains and hills, and contains no valleys or plains of large extent. A great portion of the eastern boundary is formed by that range of the Auvergne Mountains which separates the basin of the Cher from that of the Allier, while the southern boundary is formed by the crest of another range that forms the watershed between the Loire and the Dordogne. [Corrèze.] From the mountain mass in the angle between these two ranges, a chain runs due N. into the centre of the department, whence it turns N.E., separating in its whole length the waters of the Cher from those of the Creuse. Another chain, springing from the mountains on the southern border, runs for a considerable way along the western bank of the Creuse, and then diverges into numerous lines of hills which cover the west and north-west of the department. The spaces between these ranges of mountains and hills are in many instances occupied by isolated or irregularly grouped elevations, which are locally called *puys*, and of which the basalt and scoriæ found near them clearly attest the volcanic origin. The mountains generally consist of granite. Many of their crests are naked and barren, but their sides are clothed with forests of timber trees and chestnuts. The valleys are narrow, and each of them is watered by a clear stream or river flowing over a gravelly bed. The situation of the department on the northern slopes of the Auvergne Mountains, and the extent of surface covered with mountains, rivers, and ponds, render the climate cold, moist, and variable. A great deal of rain falls; storms are frequent; the winter is long and rigorous; autumn is the only fine season.

The Creuse, which gives name to the department, springs from the mountains on the southern border, and flows through a narrow valley first northwards as far as Aubusson, and thence N.W., dividing the department into two nearly equal portions. Entering the department of Indre, it passes Argenton, a little below which it turns W. as far as Le Blanc, where, resuming a north-western direction, it divides for several miles the departments of Vienne and Indre-et-Loire, passes Guerche and La-Haye, and enters the Vienne on the right bank a few miles N.W. of the latter town. Its whole length is about 130 miles, only 51 of which are navigable. It is subject to floods, which frequently rise to the height of 30 feet in the narrow valley drained by it in this department; but in summer it is in many places almost dry. The western slope of the department is drained by the Mande and the Thorion, feeders of the Vienne, and by the Gartempe and the Sedelle, feeders of the Creuse. The eastern part is drained by the Cher and its tributary the Tarde, which is itself fed by the Vouize. The Petite-Creuse rises on the eastern border, and flowing W. enters the Creuse on the right bank near the north-western angle of the department. None of these rivers are navigable in this department.

The department contains 1,379,740 acres, distributed among 68,443 proprietors, and subdivided into 1,064,454 parcels. Of the whole surface 592,560 acres are capable of cultivation, 327,036 are natural pastures, 81,840 are covered with woods and forests, and 297,300 consist of wild moors covered with heath, gorse, fern, and broom. Rye is the chief object of cultivation; buckwheat, oats, potatoes, and turnips are also raised. Agriculture is in a very backward state; the consumption exceeds the produce. The best land is in the basin of the Cher in the east of the department; in the other parts the soil is poor. Horned cattle and horses are numerous, but small in size; the sheep are much esteemed for their flesh, but they are small, and their wool is bad. Great numbers of pigs are fed. These animals form the most important exports of the department. Asses and mules are commonly used as beasts of burthen. Honey of good quality is gathered, and game is plentiful. The farms are in general divided by quickset hedges.

Iron, copper, manganese, antimony, and lead are found; coal mines are worked; granite and building stone are quarried, and potter's clay of good quality is raised. The department is famous for the manufacture of tapestry and carpets. Coarse calicoes, worsted and cotton yarn, leather, and paper are also made. Great numbers of the inhabitants emigrate yearly, and are to be met with in most parts of France, as stone-masons, tilers, sawyers, hemp and wool combers, flax-dressers, carpenters, &c. A large part of the human hair supplied to the hairdressers of the capital comes from this department, the young women generally bartering their hair for silk handkerchiefs, shawls, and other articles of dress. About 275 fairs are held in the year. Roadway accommodation is afforded by 6 royal and 9 departmental roads, the total length of which is 496 miles. The department contains 969 wind and water mills, 1 iron foundry, and 57 factories of different kinds.

The department is divided into 4 arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1841.
Guéret . .	7	77	94,137
Aubusson . .	10	113	105,434
Bourganeuf .	4	49	40,568
Boussac . .	4	57	37,890
Total. . .	25	296	278,029

In the arrondissement of Guéret, the chief town is Guéret, formerly the capital of Haute-Marche, but now of the department of Creuse. It is situated on the slope of a hill between the Creuse and the Gartempe, and has a tribunal of first instance, a college, public library, and 4849 inhabitants, who trade chiefly in cattle and butter. Ahun, 10 miles N. of Guéret, in a district famous

for cattle and dairy produce, and near a large coal field, has 2212 inhabitants. Bonnat, in which there are several Roman remains, has a population of 2830. Salagnac, on the left bank of the Gartempe, has 2601 inhabitants. La-Souterraine, an ancient town on the Sedelle, takes its name from a large cavern near it, in which there is a stream that turns a mill; it has linen factories, and 3092 inhabitants. St.-Vaulry, 6 miles N.W. from Guéret, has a population of 2522.

Of the arrondissement of Aubusson, the chief town is Aubusson, which stands on the Creuse in a wild rocky defile 20 miles S.E. from Guéret; it is an ill-built but improving town, with a tribunal of first instance; and 5196 inhabitants, who manufacture carpets, tapestry, coarse woollens and calicoes. The town also has woollen and cotton yarn factories, dye-houses, and tanyards. Evaux, formerly the capital of the Pays-de-Combrailles, stands in a well-cultivated plain between the Cher and the Tarde; it is a walled town, and has a population of 2698. Felletin, on the right bank of the Creuse, has a college and 3814 inhabitants, who manufacture cloth, coarse cottons, excellent carpets, worsted, paper, leather, &c. Chenerailles, formerly a fortified town, now a small place of 1100 inhabitants, deserves mention on account of the great number of Roman remains, funeral urns, and medals found near it.

The arrondissement of Bourganeuf takes its name from its chief town Bourganeuf, which is prettily situated on an eminence near the left bank of the Thorion, and has a tribunal of first instance, some paper and porcelain factories, and 3095 inhabitants. Royère, 10 miles from Bourganeuf, has a population of 2451. Bénévent, formerly called Segunzelas, and Pontarion, near which are extensive caverns and the remains of a Roman bridge over the Thorion, are small places that give name to the other cantons.

The arrondissement of Boussac, is named from Boussac or Boussac Ville, once an important fortress situated in a mountain gorge at the junction of the Veron and the Petite-Creuse; near it is Boussac-Bourg; the united population of the two places is 2212. Chambon, in the fork between the Tarde and the Vouize, which meet below the town, has a tribunal of first instance, some Celtic and Roman remains, and 2125 inhabitants. Auzance, in a marshy district near the source of the Cher and Chatelus, W. of Boussac, are the chief towns of the other cantons, and have each a population under 2000.

The department of Creuse, together with that of Haute-Vienne, forms the see of the Bishop of Limoges. It is comprised in the jurisdiction of the Cour Royale and University Academy of Limoges, and belongs to the 15th Military Division, of which Bourges is head-quarters. Under the late Monarchy, the department returned 4 members to the Chamber of Deputies; it now has 7 representatives in the National Assembly under the Republic.

(*Dictionnaire de la France; Annuaire pour l'an* 1847; *Decree of the Provisional Government of the French Republic.*)

CREUTZ. [CROATIA.]

CREUZNACH, a town in the government of Coblenz in the Prussian Rhein-Provinz, is situated on the Nahe, a feeder of the Rhine, in 49° 51′ N. lat., and 7° 53′ E. long., and has 8100 inhabitants. It is irregularly built; the streets are narrow and crooked. The town has two Roman Catholic and two Protestant churches, a synagogue, gymnasium, and hospital. The principal traffic is in grain, wine, cattle, salt, flax, leather, brandy, tobacco, and soap. There are salt springs near the town, which are profitably worked. In the vicinity are the interesting ruins of the Rheingrafenstein and Ebernburg, the former of which are situated on a precipitous rock of porphyry 600 feet above the Nahe.

CREUZOT. [SAONE-ET-LOIRE.]

CRE'VECŒUR. [NORD; OISE.]

CRE'VIER, JEAN BAPTISTE, born at Paris in 1693, studied under Rollin, and afterwards became professor of rhetoric in the college of Beauvais. After Rollin's death he continued his 'Roman History,' of which he wrote eight volumes. He is less diffuse than his master, but his style is less pleasing. He also published an edition of Livy, in 6 vols. 4to., 1748, with notes. In his 'Histoire des Empereurs Romains jusqu' à Constantin,' 6 vols. 4to., Paris, 1756, he has carefully followed the ancient authorities in the statement of facts. Though not a critical work, nor entitled to a high rank, it is still a useful compilation. Crévier wrote also 'Histoire de l'Université de Paris,' 7 vols. 12mo., 1761, which is in great measure an abridgement of the larger work of Egasse du Boulay; and 'Rhétorique Française,' 1765, a good work, which has been frequently reprinted. Crévier died at Paris, in December, 1765.

CREWKERNE. [SOMERSETSHIRE.]

CRICACA'NTHUS, a genus of fossil fishes, from the mountain limestone of Armagh. (Agassiz.)

CRICHTON, JAMES, commonly called 'The Admirable Crichton,' son of Robert Crichton, who was Lord Advocate to King James VI., was born in Scotland in the year 1561. He received part of his education at St. Andrew's, where the illustrious Buchanan was one of his masters. At the early age of fourteen he took his degree of Master of Arts, and was considered a prodigy not only in abilities but in actual attainments. When not more than seventeen years old, he was sent to the continent. He had scarcely arrived in Paris, when he publicly challenged all scholars and philosophers to a disputation at the College of Navarre, to be carried on in any one of twelve specified languages, 'in any science, liberal art, discipline, or faculty, whether practical or theoretic;' and, as if to show in how little need he stood of preparation, or how lightly he held his adversaries, he spent the six weeks that elapsed between the challenge and the contest in a continual round of tilting, hunting, and dancing. On the appointed day however he is said to have encountered all 'the gravest philosophers and divines,' to have acquitted himself to the astonishment of all who heard him, and to have received the public praises of the president, and

four of the most eminent professors. The very next day he appeared at a tilting-match in the Louvre, and carried off the ring from all his accomplished and experienced competitors. He next served for two years in the army of Henry III., and then repaired to Italy, and repeated at Rome, Venice, and Padua the literary challenge and triumph that had gained him so much honour in Paris. At Venice however it appears that, spite of his noble birth and connections, he was miserably poor, and became for some time dependent on the bounty and patronage of a Venetian printer—the celebrated Aldus Manutius. We next hear of Crichton at Mantua, where he fought a public duel with a professed swordsman, in which the young Scotchman was victorious, and the Italian left dead on the spot.

Soon after this the sovereign Duke of Mantua engaged Crichton as companion or preceptor to his son Vincenzo Gonzaga. At the court of Mantua Crichton added to his reputation by writing Italian comedies, and playing the principal part in them himself. His popularity was immense, but of brief duration. He was cut off in his twenty-third year, without leaving any proofs of his genius except a few Latin verses, printed by Aldus Manutius, and the testimonials of undoubted and extreme admiration of several distinguished Italian authors, who were his contemporaries and associates. He was attacked one night by several armed men, and it is generally said that it was by the sword of the young prince of Mantua that he was killed.

(P. F. Tytler's *Life of James Crichton of Cluny, commonly called the Admirable Crichton; with an Appendix of Original Papers*, 1819.)

CRICKEITH, or CRICCEITH. [CAERNARVONSHIRE.]

CRICKET. [GRYLLIDÆ.]

CRICKHOWEL. [BRECKNOCKSHIRE.]

CRICKLADE. [WILTSHIRE.]

CRICO'PORA, a genus formed by De Blainville out of a subdivision of the *Milleporidæ*, including some fossil species, which chiefly occur in the oolitic formations. *C. straminea* is found near Scarborough; *C. cæspitosa* near Bath.

CRIME and PUNISHMENT. [TRANSPORTATION.]

CRIMEA lies between 44° 20′ and 46° 10′ N. lat., and between 32° 40′ and 36° 30′ E. long., and forms a part of the Russian government Taurida. Its figure is nearly a quadrilateral, whose angles are directed to the cardinal points. From the eastern point however a peninsula stretches out between the Sea of Azof and the Black Sea. On three sides the peninsula is inclosed by the Black Sea; on the north-east it is washed by the Sea of Azof. Its area may be about 8600 square miles. The neck of land by which this peninsula is connected with the continent is about 20 miles long, and in one part only 5 broad.

Few countries of equal extent present a greater variety than the Crimea. The isthmus of Perecop and three-fourths of the peninsula form an arid plain or steppe, which is occasionally diversified with hollows. The soil varies in quality, but for the most part consists either of sand alone or sand combined with clay. Towards both seas there are numerous salt-lakes, some of which are from 15 to 20 miles in circuit. They are generally divided from the beach by narrow and low strips of land, and in their neighbourhood the country is of a dry, clayey, and saline nature, resembling the steppes on the Caspian Sea. The plain declines imperceptibly towards the lakes, and is destitute of water and wood, but in some parts covered with grass. It is nearly uninhabited.

Along the south-eastern shores a mountainous tract extends from Cape Khersonese to Kaffa; thence to the Straits of Yenikale, which divide Crimea from Caucasus, it is hilly. Some of the mountains near the sea rise to a height of 2000 feet, and rapid streams flow from them to the sea. The summit of the mountains consists of extensive flats, which may be compared with the *páramos* of the Andes, and sometimes extend several miles, with occasional eminences on them. These mountain table-lands, called by the Tartars *Yailas*, are only visited by them during hot summers, on account of the rich pastures which they supply for cattle; some of them are covered with snow till the latter end of May. Most of the remaining portions of the country are tolerably level.

The winters and summers show great extremes of temperature. In very severe winters the mercury sometimes sinks 9° below zero. The climate is so unsettled, that it often varies six or eight times in twenty-four hours. The winds are very variable, and bring rain from the west and south-west, mild air and frequent mists from the south, serene dry weather from the east, and cold from the north. In spring the weather is settled, the heat moderate and refreshing, and the nights cold and serene; there is seldom any rain, especially during the prevalence of violent east winds. In summer the thermometer frequently rises to 98°, 100°, and even 102°, On the same day however it falls sometimes 20°, or even 30°. Droughts frequently prevail for several successive years, and dry up the wells and brooks. Thunder-storms rarely occur, but they are tremendous, and sometimes accompanied by hail-stones and destructive water-spouts.

The crops cultivated in open fields are wheat, rye, barley, oats, maize, spelt, millet, chick-peas, flax, and tobacco. In the gardens are raised melons, water-melons, cucumbers, gourds, artichokes, cabbages, onions, garlic, leeks, brocoli, celery, parsley, carrots, and red beets. The numerous and extensive orchards in the valleys produce pears, apples, quinces, plums, cherries, peaches, apricots, almonds, medlars, pomegranates, mulberries, and nuts. Some of these trees grow also wild on the declivities of the mountains. The forest trees, which cover a great portion of the declivities of the mountains, especially on the northern side, are oak, beech, elms, poplars, lime-trees, maples, ash, and pines (pinus maritima). There are a few camels. Horses are numerous, and of a good breed. The horned cattle are of a middling size in the plains, and small in the mountains. There are three varieties of

sheep, all of which have a long tail, which for half its length is overgrown with fat and covered with coarse wool. Lamb-skins of fine quality are largely exported. The chief kind of fish met with on the shores is sturgeon.

The population of the Crimea is about 300,000. More than two-thirds of its inhabitants are a mixture of Monguls and Turks, and are called Tartars. Those who live on the plain show in their features their Tartar origin; but those in the northern valleys display a strong mixture of Turkish blood. There are also a few Russians, Germans, and Greeks.

The chief towns are—BAKTCHISSARAI; Simperopol (3000 inhabitants); and Karasubazaar (3700 inhabitants). The chief harbours are—KAFFA; Koslow (4000 inhabitants); Sevastopol (3000 inhabitants); Kertsch (4000 inhabitants); Balaklava, and Yenikale.

Manufacturing industry is confined to the preparation of leather, morocco, cutlery, sadlers' and shoemakers' work, and coarse earthenware. The chief exports are salt, lamb-skins, sheep's and bullocks' hides, wool, camels' hair, leather, hare-skins, wines, walnuts, fruits, together with the dry fruits imported from other parts, and fish. The imports are grain, provisions, iron, cotton, silks, wines, and tobacco.

The Greeks became early acquainted with this peninsula, probably about six centuries before the Christian æra. It was at one time considered the granary of Greece, especially of Athens, whose territory, being of small extent and of indifferent fertility, was unable to maintain its great population by its own produce.

(Strabo, vii.; Pallas; Lyall's *Travels in Russia*; Captain Jones's *Travels in Norway, Sweden, Finland, Russia, and Turkey.*)

CRIMINAL CONVERSATION. [ADULTERY.]

CRIMINAL LAW. [LAW, CRIMINAL.]

CRINUM, a genus of plants belonging to the natural order *Amaryllideæ*. The species are handsome plants, and many of them form the greatest ornaments of our gardens.

C. Asiaticum, Poison Bulb.—The bulbs of this plant are powerfully emetic, and are used in Hindustan for the purpose of producing vomiting after poison has been taken, especially that of the *Antiaris*. It is a native of the East Indies. *C. amabile* is a native of the East Indies, but is now common in our green-houses. Many of the species have been introduced within these few years.

CRIOCERATITES. The discoidally spiral *Ammonitidæ*, whose whorls do not touch each other, receive this generic title. The species occur in the oolitic and lower cretaceous strata.

CRIOCE'RIDÆ (Leach), a family of coleopterous insects of the subsection *Eupoda*, and section *Tetramera*. The principal genera contained in this family are—*Donacia, Hæmonia, Ptauristes, Crioceris, Zeugophoro, Auchenia*, and *Megacelis*.

Of the typical genus *Crioceris* about eight species are British, of which one is the Asparagus Beetle (*Crioceris Asparagi*), common on asparagus beds in the south of England.

CRITICISM. Criticism properly means an impartial judgment of a subject, the element of the word signifying in its original language, the Greek, *to separate, to distinguish, to judge*. Criticism, then, by no means implies censure. Criticism may either praise or blame, but the praise or blame is not arbitrary, it is founded on sufficient reasons; and it may neither praise nor blame, for the object of criticism is simply to judge truly of the matter which it examines.

In philosophy, the word 'critical' signifies that method of reasoning which is opposed to 'dogmatism.' A dogmatist maintains an assertion without proof; the critical inquirer not only endeavours to prove every assertion which he makes, considering fully both sides of the subject, but also commences his investigation by an analysis of the powers of the human mind, in order to ascertain what can be known, and what cannot. Upon this principle Kant's celebrated work, 'Kritik der Reinen Vernunft,' or 'Criticism of Pure Reason,' was written.

Criticism must not be confounded with scepticism, the object of which is to show that truth is not attainable by philosophical inquiry.

CROATIA (*Horvath-Orzag*), a part of Hungary which has the title of *Kingdom*, and forms a province of the Austrian empire, is bounded N. and N.E. by Styria and Hungary proper, E. by Sclavonia and Turkey, S. by Dalmatia and the Adriatic Sea, and W. by Illyria. It extends from 44° 5′ to 46° 25′ N. *lat.*, and from 14° 20′ to 17° 25′ E. *long.* It is divided into—1, Provincial Croatia; 2, the Hungarian Litorale; and 3, the Croatian Military Frontier.

Provincial Croatia occupies all that part of the province that lies W. of the Kulpa, and between the Drave and the Save, except a narrow strip on the eastern border which forms part of the Military Frontier, and is separated from Sclavonia by the Illova. It is divided into three comitats, or counties, named from the chief town in each, Agram, Warasdin, and Kreutz, and contains an area of 3639 square miles, with a population of 460,000.

The Hungarian Litorale is a narrow strip of land lying between the Merzlavoditza Mountains and the channel of Morlacca, and extending from Fiume, the chief port of Hungary, to the town of Segna or Zeugh. It has an area of about 129 square miles, a mild climate, and a rich soil yielding the olive, the grape, the fig, and the almond.

The Croatian Military Frontier occupies all the rest of the country from the Kulpa on the borders of Illyria to the Velebitchi Mountains, which separate Crontia from Dalmatia; from the Merzlavoditza Mountains and the Adriatic Sea, to the Dinaric Alps and the Unna, which form the boundary on the side of Turkey, and comprises also the narrow strip before mentioned between the Save and the Drave. It has an area of 6094 square miles, and a population of 588,000, who have a purely military government. [MILITARY FRONTIER.]

The surface of Croatia is extremely irregular. It is traversed in the north by an offshoot of the Carnic Alps which forms the watershed between the Save and the Drave. Between the Save and the Adriatic it is almost wholly covered with the

continuations of the Julian Alps, which are intersected by deep valleys, and inclose high and extensive plains. The loftiest ridge, that of the Velebitchi, is in the southern part of the country, and extends from the Zermagna to the town of Segna or Zeugh. Its general altitude is from 4000 to 5000 feet. The second chain, called the Kapella, commences in the south-western extremity of Croatia, and runs east to the bank of the Unna; the elevation of its highest summit, the Plessiovicza, on which the snow scarcely melts throughout the year, is more than 5550 feet above the sea. The mountains which compose the chain from the banks of the Kulpa to those of the Unna are much lower and less rugged. Towards the Save they gradually decline, and at its confluence with the Kulpa terminate in a plain. The greater part of these mountains consists of limestone. Many of the valleys are entirely closed, and the streams which traverse them, not having a vent, find their way to different rivers by subterraneous channels, and often inundate the surrounding country. Among the most picturesque of these valleys are those of Korbavia and Licca, which abound in waterfalls. The Szluinchicza forms above forty beautiful cascades. Croatia contains many mineral springs. Copper, iron, coal, sulphur, lead, rock-salt, and silver are found in various parts; gold is obtained from the sand of several of the rivers, especially of the Drave.

The climate of Croatia varies considerably in different parts. The southern districts enjoy an Italian climate. Here the vintage takes place in August; but in the high plains and valleys the harvest does not commence till the beginning of September, soon after which the snow begins to fall, and does not melt till April or May. On the higher summits it frequently lies the whole summer.

The scourge of this country is the wind called *Bora*, which blows from the north or north-east, and generally sets in between seven and eight A.M., and ceases at four or five P.M. It is accompanied by excessive cold, and blows with such violence that large stones are carried by it to a great distance.

The eastern and northern parts of Croatia, which are more level and less mountainous, and especially the parts watered by the Drave and Save, are very fertile, yielding wine, various kinds of grain, particularly barley, maize, and oats; the soil is also favourable for fruits, among which the damson is most carefully cultivated, as from it is distilled a sort of brandy which is the favourite drink of the Croatians. Croatia has immense forests of oak and beech. Flax, hemp, and tobacco are grown only in sufficient quantity for home consumption. The rearing of horned cattle, horses, sheep, and swine, all of which are very numerous, is the most profitable occupation of the inhabitants. The mulberry is cultivated in favourable districts. There are extensive fisheries; and much wax and honey are gathered. The manufactures are unimportant and of the rudest description, and the commerce is chiefly confined to the transit trade. The three great roads for trade are the Louisa, from Carlstadt to Fiume, and the Caroline and Josephine, leading into Illyria and Bosnia.

The inhabitants are all Roman and Greek Catholics, and strongly attached to the imperial family of Austria. The public system of education is that of the national schools. There are two gymnasia at Agram and Warasdin, and a college at Agram, which has also a seminary of theology.

The Croatian language is a dialect of the Sclavonian and of all the Illyrian languages bears the greatest affinity to the Polish.

Several islands lie to the west and south of the Molacca Channel, in the Gulf of Quarnaro, the principal of which are Veglia, Arbe, Cherso, Lossini, and Pago.

Towns.—In the county of Agram the chief town is AGRAM, the capital of Croatia, and the residence of the Ban or Viceroy, and of the military commandant of the Croatian Military Frontier. Carlstadt or Karlovecz, at the junction of the Kulpa and the Korona, has 4400 inhabitants; it is defended by a strong fortress and surmounted by a baronial castle. The three roads to Fiume, Segna, and Karlopago on the Adriatic, and the Külpa, which is navigable from this town, facilitate the communication with the rest of Hungary.

In the county of Warasdin the chief town is Warasdin, which stands about 2 miles from the right bank of the Drave; it is surrounded by walls, is well built, and contains many fine edifices, among which are several churches, a synagogue, county-house, and a bishop's palace. The town has a gymnasium, several schools, and a population of 9000. Good wine and tobacco are produced in the environs.

In the county of Kreutz or Creutz, lying E. of the two preceding counties, the chief town is Creutz, which stands on the Glogovnicza, a feeder of the Save; it is the seat of a Greek-Catholic bishop, and has 3000 inhabitants. Koprcinitza, in the valley of the Drave, is strongly fortified, and has 3200 inhabitants.

In the Hungarian Litorale the chief town is Fiume, which is beautifully situated on the shore of the Adriatic, at the mouth of the Fiumara, and has 9000 inhabitants. It consists of an old town built on a hill, and a new town which is well built, with wide handsome streets running along the shore. The chief buildings are the church of St.-Veit, the Casino, which has ball-rooms below and a theatre above, and a Roman arch in the old town. Fiume is a free port; but its trade is not flourishing, owing to the superiority of the harbour of Trieste, for that of Fiume has an intricate entrance, but within it is safe and capacious. The principal manufactures of Fiume are cloth, linen, wax, hats, tobacco, earthenware, sugar, and leather. Ship-building is actively carried on. The exports consist of wine, tobacco, rags, staves, timber, hemp, linen, fur, &c.: the imports are manufactured goods, colonial produce, &c.

The Croatian Military Frontier is divided into the generalates of Carlstadt, and Warasdin, and the Banal Frontier, which last is contiguous to Turkey. The generalate of Carlstadt contains the small towns of Ogulin, Gospich, Ottochaz, and Szluin, which give name to the 4 circles into which the generalate is divided, and to the 4 regiments which it furnishes. To this generalate also belong

the town of Segna or Zeugh, on the Adriatic, which is a free port with a considerable trade and 5000 inhabitants; and Karlopago, also on the coast, considerably further south. The generalate of Warasdin contains 2 circles, furnishing 2 regiments, the head-quarters of both of which are at the town of Bellovar, a small place E. of Creutz, with about 2000 inhabitants. The Banal Frontier furnishes 2 regiments, one of which has its head-quarters at Glina, and the other at Petrinia, a town of 3200 inhabitants, on the Kulpa. In this part also is the strong town of Kostainicza, on the left bank of the Unna, which has 2900 inhabitants, and is the residence of the Bishop of Carlstadt.

(*Die Oesterreichische National Encyclopädie;* Hassel, *Handbuch;* Balbi, *Géographie;* Murray's *Hand-book for South Germany.*)

CROCKET, an ornament of frequent use in Gothic architecture. It consists of leafy buds growing out of the angular sides of pinnacles and the label moulding of windows and doors.

CROCODILE, CROCODILE TRIBE, CROCODILIDÆ, a family of *Saurians*, comprising the largest living forms of that order of reptiles. Duméril and others distinguish the family by the appellation of Aspidiot (Shielded) Reptiles; while many modern zoologists have considered them as constituting a particular order. They form the *Loricata* of Merrem and Fitzinger, and the *Emydosaurians* of De Blainville. For the general characters of these terrible reptiles see the article ALLIGATOR.

Of the three genera into which the present family is divided, *Alligator* is peculiar to America; the second, *Crocodilus*, is common to the Old World and to America; while the third, *Gavialis*, seems to be limited to the Ganges, and the other large rivers of continental India.

Of the restricted genus *Crocodilus* (distinguished by the contraction of the muzzle behind the nostrils, and by the reception of the fourth tooth on each side of the lower jaw into a notch of the upper jaw), M. Bibron enumerates the following species:—1, *Crocodilus rhombifer;* locality, Cuba. 2, *Crocodilus Gravesii;* locality, Africa. 3, *Crocodilus vulgaris;* locality, Egypt, Senegal, Madagascar, Malabar, &c. 4, *Crocodilus galeatus*, Cuvier; locality, Siam. 5, *Crocodilus biporcatus;* locality, the Ganges in India, the rivers of Pondicherry, Batavia, the Seychelles, Timor, Java, &c. 6, *Crocodilus acutus;* locality, St. Domingo, Martinique, and the northern parts of South America. 7, *Crocodilus cataphractus;* locality, the river Galbar, near Sierra Leone, Fernando Po. 8, *Crocodilus Journei;* locality, unknown. Mr. Bennett has described a species from Fernando Po under the title of *C. leptorhynchus* ('Proceeds. Zool. Soc.,' 1835): it is altered to *C. cataphractus*. Of the *C. vulgaris*, MM. Duméril and Bibron enumerate four varieties, viz. *C. vulgaris*, *C. palustris*, Lesson, *C. marginatus*, Geoffroy; *C. suchus*, Geoffroy. ('Erpétologie,' vol. iii. p. 104, et seq.)

Habits, Reproduction, &c.—Cuvier says that the *Crocodilidæ* inhabit fresh water, and that they cannot swallow while in the water, but drown their prey, and place it in some nook under the water, where they suffer it to putrefy before they eat it. This account seems to require some modification. Mr. Lyell, in his 'Principles of Geology,' observes that the larger Gangetic species descends beyond the brackish water of the Delta into the sea: and other instances are recorded of the true crocodiles (but not of the alligators) frequenting the mouths of large rivers, and even passing between different islands at considerable distances from each other. [ALLIGATOR.] This should be remembered by geologists. Then, as to their inability to swallow while in the water, those authors who describe their collective fishing expeditions entirely contradict it. True it is, according to them, that the alligators, after they have seized the fish from below, *rise to the surface* and toss the fish *into the air* to get rid of the water which they have taken in with it, catching it again in its descent; but it is clear that they swallow it without resorting to the land, though they go thither for the purpose of devouring those land animals which they have succeeded in capturing and drowning, after they have undergone some degree of decomposition. This mode of proceeding and a general view of the habits of the Caimans, which may be taken as an example of those of the whole tribe, is stated in the article ALLIGATOR.

The Crocodile (*Crocodilus vulgaris*) of Egypt and Senegal on the upper part of the body is of an olive-green colour, sprinkled with black on the head and neck; the lower part of the body is of a greenish yellow. The length is from eight to ten feet. It is said to be no longer seen in the Delta of Egypt, but is occasionally perceived in considerable numbers in the Thebaid and Upper Nile. The Crocodile was held sacred by the ancient Egyptians. ('Egyptian Antiquities' in 'Library of Entertaining Knowledge.')

Crocodile (*Crocodilus vulgaris*).

We here subjoin some information from an eye-witness, M. Ricord, as to the mode of reproduction of the crocodiles of St. Domingo, and transmitted by him to MM. Duméril and Bibron. 'L'accouplement m' a semblé se faire de préférence au bord de l'eau; la femelle se place sur le côté, et tombe quelquefois sur le dos, ainsi que j'ai pu le voir une fois; l'intromission dure assez long temps,

puis ils se plongent tous deux dans l'eau. 'The laying of the eggs takes place in April and May, and the number amounts from twenty to twenty-five, more or less, laid at many times. The female deposits them in the sand with little care, and scarcely covers them. I have met with them in the lime which the masons had left on the bank of the river. If I have reckoned right, the young come forth on the fortieth day, when the temperature is not too cold. At their birth they are five or six inches in length. They are hatched alone, and, as they can do without nourishment while coming out of the egg, the female is in no haste to bring it to them: she leads them towards the water and into the mud, and disgorges for them half-digested food. The male takes no account of them.' The young preserve for some time the umbilical mark or cicatrice on the abdomen, whereby the vitellus was absorbed.

With respect to the restricted genus *Gavialis*, it contains only one recent species (*Gavialis Gangeticus*). Cuvier indeed was led to think, principally from the figures published by Faujas de Saint Fond, that there was more than one species, and on subsequent inquiry distinguished two, the *Great Gavial* and the *Little Gavial;* but he was afterwards satisfied from the examination of numerous specimens, that age alone made the difference between them. The synonyms of the *Gavialis Gangeticus* are very numerous.

The following description will show the distinctive characters of the Gavial. The head may be considered as framed of two parts; one anterior and long, almost cylindrical in form, more or less flattened; the other posterior and short, presenting the figure of a depressed hexahedron, wider behind than before. The jaws constitute the anterior part or beak, which is long, straight, and of extreme narrowness, but not, properly speaking, cylindrical. It is four-sided, but the angles are rounded. It spreads out at its base and terminates in front, so as to recall to the observer the beak of the Spoonbill. Its vertical diameter is throughout less than its transverse diameter.

The head, properly so called, that is, the part situated behind the beak, has its sides straight and perpendicular. The upper surface is quadrilateral. The post-orbital portion is flat and smooth, except that one can perceive through the skin the subtriangular or ovöid holes with which the skull is dotted. The other portion is considerably inclined forwards, and mostly occupied by the eyes, the interval between which forms a slight gutter-like depression. The mandible is not continued from the forehead by a gradual slope as it is in the Crocodiles, but sinks suddenly to follow a straight and nearly horizontal direction, on a line with the inferior edge of the orbit. At the extremity of this upper mandible are the four notches for the passage of the first and fourth lower teeth when the mouth is shut. Two of these notches are very deep, and situated quite in front; the other two are moderate, and placed one on the right, and the other on the left, behind the spatuliform termination of the beak, where it is slightly constricted.

The division of the lower jaw into two branches does not commence till towards the twenty-second or twenty-third tooth. The first ten upper teeth, among which the two anterior teeth are the least separated, are implanted in the intermaxillary bone, and the greater portion of the teeth of the upper mandible are longer than the corresponding teeth of the lower jaw. Up to the nineteenth or twentieth pair they are turned a little outwards, so that when the mouth is shut the upper teeth pass over the sides of the lower jaw, and the lower teeth over the sides of the upper. The last six pairs are straight or nearly so, so that the points of the one set correspond exactly with the intervals of the other. The first, the third, and the fourth above, and the first, second, and fourth below, are the longest. They are, in general, a little curved and slightly compressed from before backwards, and are very slightly trenchant right and left. Hardly more than the last eight or nine on each side are nearly conical. Slight vertical ridges show themselves on the surface of the teeth of the old individuals.

Under the throat, about the middle of the branches of the maxillary bone, are situated, one on the right and the other on the left side, the musky glands.

The external orifice of the nostrils opens on the upper side of the beak, at a small distance from its terminal border. The aperture is semilunar, at the bottom of which may be perceived a cartilaginous plate, which divides it longitudinally in two. The edges of this opening form two lips, which appear to have the power of approaching each other, so as to close the aperture hermetically. The anterior of these is curvilinear, and the posterior rectilinear: in the females and in young subjects they are very delicate and quite soft; but in the old males the anterior lip not only arrives at a cartilaginous consistence, but a development that carries it backwards as far as the seventh pair of teeth, and triples the thickness of the muzzle. This pouch or cartilaginous sac, with two compartments, is of a sub-oval form, and is notched behind so as to form two very thick rounded lobes. Above these is, on the mesial line and in front, a cordiform prominence, on each side of which is a deep fold in the form of the letter S. This sac has its opening, which is common to it and the nostrils, below. This apparatus is the nasal purse or pouch (*Bourse nasale*) of M. Geoffroy, and in his opinion performs the office of a reservoir of air for the animal when plunged beneath the surface of the water.

The Gavial is one of the largest of the living Saurians. The measurement of the largest noticed by MM. Duméril and Bibron is given at five metres and forty centimetres (17¾ feet).

Fossil Crocodilidæ.—Fossil relics of *Crocodilidæ* occur in the secondary and tertiary strata.—'In the living subgenera of the crocodilean family, we see the elongated and slender beak of the gavial constructed to feed on fishes; whilst the shorter and stronger snout of the broad-nosed crocodiles and alligators gives them the power of seizing and devouring quadrupeds that come to the brinks of rivers in hot countries to drink. As there were scarcely any mammalia during the secondary periods, while the waters were abundantly stored

with fishes, we might à *priori* expect that, if any crocodilean forms had then existed, they would most nearly have resembled the modern gavial, and we have hitherto found only those genera which have elongated beaks in formations anterior to and including the chalk; whilst true crocodiles, with a short and broad snout, appear for the first time in strata of the tertiary periods in which the remains of mammalia abound.' (Buckland in 'Bridgewater Treatise.')

Of the long-nosed fossil genera we may mention, *Steneosaurus*, Geoffr., which approaches the nearest to the living gavial, and *Teleosaurus*, from the lias, oolite, &c. The broad-nosed species may be referred to the genera Crocodilus and Alligator.

CROCUS, a beautiful genus of iridaceous plants, consisting of many hardy species, some of which are among the commonest ornaments of gardens. Crocuses are chiefly found in the middle and southern parts of Europe and the Levant, three only being wild with us, namely *Crocus nudiflorus*, *C. vernus*, and *C. sativus*.

C. vernus.—This is the common Purple or White Crocus of our gardens in the spring. It has produced a multitude of florists' varieties, some of which are extremely beautiful and well marked. *C. versicolor*, the common Sweet-Scented and Variegated Spring Crocus, grows wild about Nizza (Nice), and in all the eastern parts of Provence. *C. biflorus*, the Scotch Crocus, is a native of the most southern parts of Italy, growing wild in sterile subalpine pastures in the kingdom of Naples, and in similar situations in Sicily. *C. luteus* or *maesiacus*, the Large Yellow Crocus, is an oriental plant, but its exact locality is unknown. *C. aureus*, the Small Yellow Crocus, is by no means so common as the last, of which it is probably a variety. Dr. Sibthorp found it wild on the hills of the Morea. *C. susianus*, the Cloth of Gold Crocus, is a native of the Crimea, the Ukraine, and other parts of south-western Russia.

Crocus Sativus.—The Saffron Crocus is a native of Asia Minor, but extensively cultivated in the more southern countries of Europe. That which is obtained in England, chiefly from Suffolk, is from the *Crocus autumnalis*, and is scarcely now to be met with, being nearly quite supplanted by the saffron imported from Spain. The officinal part is the stigmata of the flower, with a small part of the style attached. The plant flowers in September and October, and once a day the stigmata are carefully plucked out of the open flowers, and dried on paper or sieves, either in the sun, in a room, or by kilns if the weather be unfavourable for drying in the sun. The attention necessary for procuring it in perfection may be estimated from the circumstance, that nearly 40,000 flowers are required to yield one pound of saffron. The good saffron occurs only in the state called Hay; that which is termed Cake Saffron is entirely composed of the flowers of a compound plant called *Carthamus tinctorius*, or Safflower.

Saffron formerly enjoyed a high repute, both as a perfume, and as a nervine, stomachic, and narcotic drug. That the odour has powerfully affected some very susceptible individuals is undeniable; but so little regard is now paid to it, that it is employed chiefly as a colouring ingredient, or adjunct to other more powerful agents. It was formerly cultivated in Essex, and the town of Saffron Walden has obtained its name from that cause.

C. odorus, a native of Calabria, *C. Thomasii*, likewise a Calabrian plant, and *C. ecrotinus* are amongst the other varieties of this beautiful genus.

CRŒSUS, son of Alyattes, succeeded his father as king of Lydia, at the age of thirty-five, B.C. 560. (Herod., i. 7 and 26.) He was contemporary with Pisistratus, tyrant of Athens (Herod., i. 59), and with Anaxandrides, king of Sparta. He attacked and reduced to subjection all the Ionians and Æolians, in Asia and all the nations west of the Halys (the Kizil-Ermak). He conquered the Cappadocian Syrians, east of the Halys. After an indecisive engagement with Cyrus the Persian, Crœsus was attacked by him in his own capital, Sardis, which was taken by the Persians B.C. 546. Crœsus was made prisoner, and was placed on a pile to be burnt, but Cyrus relented, and the fire was extinguished. He reigned fourteen years. After his captivity he became the favourite companion of Cyrus. While king, he was visited by Solon; and Herodotus (i. 30—33) records a long conversation between them on wealth and happiness. The wealth of Crœsus has passed into a proverb.

CROFT, WILLIAM, was born in Warwickshire in 1677, and educated in the Chapel Royal, London, under Dr. Blow. He became successively organist of St. Ann's, Soho; gentleman-extraordinary, organist, and composer of the Chapel Royal; organist of Westminster Abbey; and was made Mus. Doc. by the University of Oxford. These preferments occurred between 1700 and 1715. He died in 1727. His anthem-organ exercises, and other church music, are held in the highest estimation. He composed also several sonatas and songs, and published a large work, 'Musica Sacra,' in two folio volumes.

CROMARTY. [Ross and Cromarty.]

CROMER. [Norfolk.]

CROMLECH, a large stone placed in the manner of a table, but in an inclined position, upon other stones set up on end. Two of the largest cromlechs in Britain remain at Plas Newydd, in Anglesey. Many others are seen in Wales. They are likewise found in Scotland, Ireland, Jersey, Britany, and in fact wherever the religion of the Druids prevailed. Cromlechs are also described to have been found both in North and South America. It is not clearly determined whether they were erected for sepulchres or altars.

CROMWELL, THOMAS, was born at Putney, near London, where his father was a blacksmith, and afterwards a brewer. He received a good education, and at an early age went to the Continent, where he learned several foreign languages. He became clerk in a factory at Antwerp; whence he was taken to Rome in 1510, by some merchants of Boston, in Lincolnshire, who thought he might be useful to them in some business which they had with the pope. On his return he was re-received into Cardinal Wolsey's employ, and was returned as a member to the House of Commons, where he defended Wolsey, who had been in-

dicted for treason. After the cardinal's fall, Cromwell was taken into the service of the king: in 1531 he was knighted, and made privy councillor and master of the jewel-house. He now rapidly rose to the most important offices in the state. In 1532 he became Clerk of the Hanaper in the Court of Chancery, and afterwards Chancellor of the Exchequer: in 1534 he was Principal Secretary of State, Master of the Rolls, and Chancellor of the University of Cambridge; in 1535 Visitor-General of English monasteries, and in 1536 Keeper of the Privy Seal. He then resigned the Mastership of the Rolls, and was created Baron Cromwell of Okeham in Rutlandshire, and appointed Vicar-General and Vicegerent in all religious matters, the next in authority to the king, who was now the supreme head of the English Church. His friendship with Cranmer was intimate, and their views respecting the Reformation very similar. The sudden rise of Cromwell, his measures in favour of the Reformation, and his wealth, occasioned him to have many enemies, but he continued to preserve the king's favour. In 1537 he was appointed Chief Justice of all Forests beyond Trent; in August in the same year was elected Knight of the Garter, and nominated Dean of Wells; in 1538 he was made Constable of Carisbrook Castle; and in 1539 he was created Earl of Essex, and named Lord Chamberlain of England.

Hitherto there had been little check to the career of Cromwell's prosperity: but his fear of the predominance of the Catholic party led him to promote with great zeal the marriage of Henry with Anne of Cleves. This he effected, but the dislike of Henry to his bride caused him to listen more favourably to the charges brought against Cromwell, who was at length arrested, June 10, 1540, and committed to prison. He was impeached of treason, heresy, oppression, and bribery. He was not allowed to make any defence, and after an imprisonment of six weeks was beheaded on Tower Hill, July 28, 1540.

CROMWELL, OLIVER, the son of Robert Cromwell, and his wife Elizabeth, daughter of Sir Richard Stuart, was born in the town of Huntingdon, on April 25, 1599. He was educated at a school in Huntingdon till 1616, when he was sent to Sidney Sussex College, Cambridge, but did not distinguish himself greatly at either. On his father's death, which happened soon after he went to college, he was entered at Lincoln's Inn, but he felt no inclination for the study of law, and fell, it is said, into the vices and extravagancies of the town, until he had greatly injured his character and impaired his fortune. The inconvenience arising from the latter, and compunction for the former, induced a total change of conduct: he became grave and religious. He thus regained the friendship of his relations, the Barringtons and the Hampdens, who arranged for him a marriage with the daughter of Sir John Bouchier, a virtuous and sensible woman, with a moderate fortune. Cromwell was now twenty-one, and his attachment to the Puritans began to be publicly shown, his house at St. Ives being the resort of many of the disaffected clergy. In 1628 his dissatisfaction with the proceedings of the court being well known, he was elected member of parliament for Huntingdon, but the king very speedily dissolved that parliament. Soon after the dissolution his circumstances became more embarrassed, and he was forced to sell a portion of his property, and at this time, if at all, he was engaged in a brewery. In 1636 Sir Thomas Stuart, his maternal uncle, died, and Cromwell succeeded to an estate in the Isle of Ely producing about 500*l.* a year; but, in the hope of better providing for his children, he determined in 1637 to emigrate to America, but was prevented by a proclamation forbidding such embarkations, unless under a license from the government, which he knew that he should be unable to procure. He then lived at Ely in retirement with his wife and children; and in such esteem was he held, that he was elected representative of the town of Cambridge, both to the short-lived parliament of 1640, and afterwards to the Long Parliament, by which it was speedily followed.

Cromwell was now in the middle age of life; his health was strong, and his judgment matured; yet he had deficiencies, not only in fortune, but in person and in knowledge, which precluded any anticipation of the height to which he would rise.

The tyranny and maladministration of the weak and obstinate Charles became the subject (1641) of a violent remonstrance from his parliament, which at once insured their rupture with the king. Cromwell, now associated in the councils of Hampden, Pym, and the rest of the democratic leaders, strenuously supported this remonstrance, and in 1642, when the civil war commenced, eagerly raised a troop of horse, under the authority of the parliament. All writers bear testimony to the military abilities that he displayed throughout the succession of battles between the parliamentary and royalist forces. At Marston Moor, at Stamford, and in the second battle of Newbury, he was equally distinguished; and so valuable were his services considered by the parliament, that he was exempted from obedience to the 'self-denying ordinance.' At the battle of Naseby (June 1645) Cromwell commanded the right wing, and Ireton, his son-in-law, the left; the main body of the royalists was commanded by the king in person. Ireton was repulsed early in the day; but Cromwell and Fairfax, taking advantage of Prince Rupert's temerity, totally dispersed the king's infantry, and took his artillery and ammunition.

The king, who had passed the winter 1645-6 at Oxford, escaped from that city in May, and threw himself upon the protection of the Scottish army at Newark. After some negotiations he was given up to the parliamentary commissioners, from whom he was taken by Cornet Joyce on the part of the army. The king was at this time sought by both parties; but after the triumph of the army over the Scots in the north, the Welsh in the west, and after the 'purge' of the House of Commons, the flight of the king to the Isle of Wight, and his being brought back to London, his trial was resolved upon in 1649, and his exe-

cution followed. Cromwell has been represented as having been reluctantly forced into this decisive measure. Perhaps he was, for he was not naturally a cruel man; but, once convinced of its necessity, he seems to have had no hesitation either in forwarding the decision, or in withstanding the entreaties even of his own family to save the king's life. Soon after the execution, the House of Lords was declared by a vote to be useless, and a council of state was formed, with Bradshaw for president, and Cromwell a principal member. Difficulties soon crowded round their government. A mutiny broke out in the army, which was suppressed with difficulty; and Ireland was still hostile to the parliament. Cromwell joined in August 1649 the army which had been sent there: he besieged and took Drogheda, gave no quarter to the garrison, and proceeded to capture Wexford, Kilkenny, and Clonmell. In nine months the country was nearly subdued; and, leaving Ireton to complete the task, Cromwell returned to London, where he was received with fresh honours by the parliament.

In 1650 Prince Charles, the heir of the crown, arrived in Scotland, and was received as king by the Presbyterian party. The English government became alarmed, and it was determined to march northward with all the troops that could be raised. Fairfax, himself a presbyterian, refused to lead the forces, and Cromwell was therefore nominated to the command, and became the general of the commonwealth. He began his march with 16,000 men (1650). The miscarriage of provisions was at first severely felt; but, when supplies arrived, the troops regained their courage. The battle of Dunbar was gained by the English, and Edinburgh and Perth were taken. Upon this Charles II. suddenly marched into England. Cromwell by forced marches overtook the king, and brought him to an engagement near Worcester, the result of which was a total defeat of the royalists (September 1651).

How early Cromwell thought of taking into his hands the reins of government cannot be determined: after the battle of Worcester however his mind was bent upon this object; but the war with Holland occupied much of his attention and engrossed the thoughts of the nation. At length (1653), perceiving that the parliament became daily more jealous of his power, he determined to put an end to their authority. This he effected by the memorable dissolution of the Long Parliament. The next step was to summon by name 139 persons, and to constitute them a parliament for the purpose merely of surrendering their power to Cromwell, who, after their voluntary resignation, was declared 'Protector' by a council of the officers of his army, and solemnly installed in his dignity (1653).

The difficulties of Cromwell's administration were great; but they were surmounted by his vigour and ability, which shone forth as much in wielding his power as in obtaining it. The point that seemed most to perplex him was the calling together of parliaments: he would neither reign with them nor without them. He abruptly dissolved the House in 1654, in direct contradiction to the advice of Whitelock and his friends generally: but in 1656 his success at home and abroad encouraged him to assemble another parliament; the majority however was still intractable, and he then ordered the doors of the House of Commons to be guarded, and that no member should be admitted unless he produced an order from his council. Thus 'purified,' this assembly voted the abolition of all title to the throne in the family of the Stuarts; and Colonel Jephson moved that the crown should be bestowed upon Cromwell. Cromwell wavered somewhat; but he felt that the danger of acceding would be imminent, while the increase of power would be trifling. He therefore reluctantly rejected it.

As Cromwell's treatment of his parliaments was arbitrary, so also were his dealings with the courts of justice. He degraded three judges without just cause, and intimidated the barristers. Equally shameless were the means which were used for the erection of the courts, by which, in 1654, Gerard and Vowel, and, in 1658, Slingsby and Hewit, were brought to the scaffold.

The foreign policy of the Protector has been variously estimated. It seems to have been imprudent, but magnanimous, enterprising, and ultimately successful. At length, fatigued by the pressure of public business, uneasy at the general prevalence of discontent, and, as is said, harassed by a fear of assassination, his health gave way, and he died of fever and ague on Sept. 3, 1658, the anniversary of his victories at Dunbar and Worcester. 'His burial,' says Sir Walter Scott ('Tales of a Grandfather'), 'was conducted with unusual pomp and magnificence at Westminster: but his corpse was not suffered to rest in peace. At the Restoration it was disinterred by the royalists, and, having been hung at Tyburn, was cast into a hole beneath the gallows.'

CROMWELL, RICHARD, the third son of Oliver Cromwell the Protector, but the eldest that survived him, was born at Huntingdon on October 4, 1626. He was educated at Felsted, in Essex, with his brothers Henry and Oliver, and thence removed to Lincoln's Inn, where he was admitted in 1647. His study of the law was only nominal, and he took no part in the public affairs of the time under his father. At the age of twenty-three he married Dorothy, the eldest daughter of Richard Major, Esq., of Hursley, in Hampshire, to which place he retired, following the sports of the field and other rural pursuits. When however his father was made Protector, he forced him from his retirement, nominated him for the counties of Monmouth and Southampton, for which he was elected in 1654, and appointed him first lord of trade and navigation. In 1656, he was again chosen member of parliament for Hampshire and the University of Cambridge; in the following year he succeeded his father in the chancellorship of Oxford; and shortly afterwards he was made a privy councillor, a colonel in the army, and leader of the newly constituted House of Lords.

On the death of his father on Sept. 3, 1658, Richard Cromwell succeeded him as Protector, and for a short time the peace of the kingdom was undisturbed. Thurloe, Whitelock, and Broghill were

his chief counsellors. The aspect of affairs very soon began to change. Discontents prevailed; the want of resources was felt; it became necessary to call a parliament (1659); and intrigues among almost every faction and sect in the kingdom were set on foot. The parliament and the army were at utter variance. The parliament passed a vote that no council of officers should assemble without the Protector's consent. The army demanded the dissolution of the parliament, which the Protector wanted resolution to deny. The dissolution was equivalent to his dethronement, and he soon afterwards signed his abdication in form, April 22, 1659. His brief reign ended, Richard Cromwell descended into humble life, burdened with debts, arising partly from the pompous funeral of his father, the cost of which, amounting to 28,000*l.*, the state unworthily suffered to descend upon him. To assist him in these difficulties, the parliament voted him 20,000*l.*; but so small a portion of the money was paid, that he was still in danger of being arrested by his creditors. To leave England was his only method of escape from them, and he therefore resided sometimes at Geneva and sometimes at Paris. At length he ventured to return to England about 1680. A house was hired for him at Cheshunt, in Hertfordshire, where at first he concealed himself under a feigned name, and continued to live in strict privacy, until the year 1712, when he died in his 86th year.

CROMWELL, HENRY, fourth son of Oliver Cromwell, Lord Protector, but the second and youngest that survived him, was born at Huntingdon in January 1627-8. He was educated at Felsted, in Essex, and enrolled in the parliamentary army at the age of sixteen. In 1649, having become a colonel, he went with his father to Ireland, where he behaved with considerable gallantry. He was one of the members for that kingdom in the Bare-Bones Parliament. He married, in 1653, a daughter of Sir Francis Russell, of Chippenham, in Cambridgeshire, and resided at Whitehall until he was appointed Lord Deputy of Ireland, being at the time (1654) a member for the University of Cambridge. During the following year he was again sent to Ireland, where he behaved so as to acquire great reputation by his talents, and great esteem for his kindness. He retained this office until the deposition of his brother, upon which event Henry was desirous of keeping Ireland for the king, and it was not until his submission was forcibly required by the parliament that his object was finally relinquished. Henry now retired to Chippenham, whence, in five or six years, he removed to his estate at Soham in Cambridgeshire, where he spent the remainder of his days, and died at the age of forty-six (1673 4).

CRONSTADT, or KRONSTADT, the capital of the district of Kronstadt, and the largest and most commercial town of Transylvania, stands in a narrow valley at the foot of the Eastern Carpathian Mountains, in 54° 40′ N. lat., 25° 33′ E. long., and has 36,000 inhabitants. The inner town is surrounded with walls, towers, and ditches; it is well built, and is inhabited mostly by Saxons or their descendants. There are three suburbs, inhabited chiefly by Wallachians. The inner town has five gates, six principal streets, which are straight and regular, and a spacious market-place with two fountains. Among the chief buildings are—the Protestant church; the Roman Catholic church, dedicated to St. Peter and St. Paul; the town hall, in the market-place; the old Lutheran church of St. Bartholomew; and the Kaufhaus, or mart, which is the general place of rendezvous for merchants of all nations, Saxons, Hungarians, Armenians, Greeks, Turks, Wallachians, Jews, Gypsies, and Bulgarians, who meet here at the annual fairs and expose their goods for sale, while Turkish money-changers are seated outside and around the market-place for the exchange of Austrian and Turkish coins. The town contains a gymnasium, a high school, a military academy, a normal school, two hospitals, a house of correction, and a house of industry.

The inhabitants manufacture cloth, linens, cottons, coarse woollens, hosiery, woollen yarn, &c., flasks of maple wood, &c. There is a paper-mill, and two grounds for bleaching wax. Cronstadt was the first place in Transylvania where a printing-press was established. The town has a very important commerce in manufactured goods, Austrian and Turkish produce, salt, &c., which is chiefly in the hands of a Greek trading company.

CRONSTADT, a town, fortress, and port in the Russian government of St. Petersburg, is situated in 59° 58′ N. lat., and 25° 49′ E. long., at the south-eastern extremity of the island of Cotlin, in the Bay of Cronstadt, about 16 miles from the mouth of the Neva, and 20 from St. Petersburg. The population during summer, including the garrison and those employed on the river, amounts to 45,000. At the entrance of the harbour, on an island opposite the citadel, lies the fortress of Cronschlott, built by Peter the Great. The passage between this fortress and Cronstadt is 2000 paces in width, and has ample depth for the largest vessels.

Cronstadt is the harbour of St. Petersburg, and the principal naval station of Russia. It is built in the form of a triangle, and is strongly fortified on all sides. The citadel is built on a rock in the bay, and commands the three harbours of the town, one of which, capable of containing 600 ships, is allotted to merchantmen. The imperial naval harbour is formed by a mole, and can accommodate 35 ships of the line besides smaller vessels. Adjacent to it are slips for building ships, a powder-magazine, a manufactory of pitch, tar, &c. Vessels are repaired and built in the large canal of Peter the Great, which runs directly into the town between the middle and merchant's harbour. Near it are the various docks for repairing ships; the foundry, which supplies annually 1200 tons of bombs, balls, &c.; the admiralty rope-walk, tar-works, and excellent wet docks. By the Catherine Canal vessels are enabled to take their stores, munition, &c., directly from the store-houses. Large vessels load and unload at Cronstadt, and the cargoes are conveyed to and from St. Petersburg by lighters; but vessels drawing not more than 8½ feet water can get over the bar of the Neva and proceed directly up

to the city. The navigation is shut in consequence of the ice from the end of October to the end of April generally; during the season of business the waters of the bay and river present a most animated appearance, ships arriving in fleets with foreign produce, and the long barges that navigate the interior of Russia dropping down the Neva with the produce of the country.

The town is very regularly built, and contains many fine, straight, and well-paved streets, and several public squares. The houses however; with the exception of those belonging to government, are chiefly of one story, and built of wood. There are three churches and two chapels of the Greek worship, besides Lutheran, Anglican, and Roman Catholic chapels. The city has three gates, and is divided into two parts, the Commandant and Admiralty quarters. It has a school of pilots, which is held in the Italian palace built by Prince Menzikoff; a naval hospital with accommodation for 2500 patients, and a separate building for officers of the navy. Among other public buildings we may mention the admiralty, exchange, custom-house, barracks, various schools, an invalid asylum for 60 females, the nobility's club, and the house in which Peter the Great resided for some time.

The imports, exports, and shipping will be noticed more appropriately in the article on St. Petersburg. [PETERSBURG, ST.]

CRONSTEDTITE (*Hydrous Silicate of Iron*) occurs massive and crystallised. Primary form, a rhomboid. Colour, black and brownish black. Hardness, 2.0 to 2.5. Specific gravity, 3.3 to 3.36. Found in Cornwall, Brazil, and Bohemia. Silica, 22.45; oxide of iron, 58.85; oxide of manganese, 2.89; magnesia, 5.08; water, 10.70.

CROOKED ISLANDS, a group of three islands, called Crooked, Acklin's, and Fortune, and several rocky islets which stand on the Great Bahama bank, and form part of the Bahama government. [BAHAMAS.] At the south-west end of Crooked Island there is an unsafe anchorage, with a custom-house and post-office, where the Bahama mail is left, and taken up by the Jamaica packet on her voyage home. The population is very scanty, and supplies are scarce and dear, but a stock of turtle is constantly kept in ponds.

CROPS. [EMBLEMENTS.]

CROSIER, from *Crocia*, in the Latin of the Middle Ages, a pastoral crook or staff, formerly used by bishops and abbots. These pastoral crooks were sometimes barely curled, and at others very richly ornamented. The abbot's staff was usually of a simpler form than that of the bishop. One of the earliest abbatical staffs, the form of which can be seen in England, is probably that represented on the tomb of Abbot Vitalis, in the cloister of Westminster Abbey, who died in 1082. The most splendid episcopal crosier remaining is that of William of Wykeham, of silver gilt, richly enamelled, which is exhibited to visitors in the chapel of New College, Oxford, to the society of which the bishop himself bequeathed it in 1404.

CROSS, from the Latin 'Crux.' This cruel mode of punishment appears to have been in use from the earliest recorded periods of history.

Crosses were made of two pieces of wood crossing one another either at right angles, or in a form like the letter X; there were also other varieties.

Among the Carthaginians, persons of all conditions were subjected to the punishment of the cross; but among the Romans it was the punishment of slaves only, and sometimes of robbers and other malefactors. With respect to the Jews, it seems doubtful whether crucifixion, as we understand it, was a mode of punishment used by them in ancient times.

Previous to crucifixion the sufferer was scourged. He was also forced to carry his own cross. Previous to the infliction of the punishment, the person was stripped quite naked, and it is probable that he was generally laid down on the cross for the purpose of having the nails driven in his hands and feet, or being fastened with ropes, which was sometimes the case. The cross was then elevated. Afterwards the legs were broken, and wounds inflicted with a spear, or other sharp instrument, to hasten death; but this was not always done. As death, in many cases, did not ensue for a length of time, guards were placed to prevent the relatives or friends of the crucified from giving them any relief, or taking them away whilst alive, or removing their bodies after they were dead.

Death by the cross, in a strong and healthy person, must have been tedious and lingering, and instances have occurred of persons who, after remaining some time on the cross, were taken down and survived. When the crucified person was only attached to the cross by ropes, this seems by no means extraordinary; and, even when it took place by nailing, neither the wounds themselves nor the quantity of blood lost would be sufficient, in all cases, to bring on speedy death. During the reign of Louis XV. several women (religious enthusiasts, called Convulsionaires) voluntarily underwent crucifixion, though not unto death. One of these females, Sister Felicité, declared to an eye-witness of one of her crucifixions, that it was the twenty-first time she had undergone it.

(Justus Lipsius, *De Cruce Libri Tres, Opera*, vol. iii., ed. 1675.)

CROSS. Various religious edifices called crosses, from their being surmounted with this emblem of Christianity, have been erected in England and on the Continent. The most remarkable which remain in England are those built by the command of Edward I. in memory of his queen Eleanor, at Geddington, Northampton, and Waltham Cross. Churches have usually crosses fixed on their gable ends. Market-crosses were formerly very common in England. They are often designed with niches and vaulted, thus forming an open chamber, as at Salisbury and Chichester. Winchester Cross, which is one of the most perfect of the crosses erected for religious purposes, is of much later date than those erected by Edward I. Near Ely, on the road to Downham-market, there is a singular cross, consisting of a long slender stone shaft, on the top of which there are richly carved niches projecting beyond the sides of the shaft.

CROSS-BOW. [ARCHERY; ARMS.]

CROSSBILL. [LOXIADÆ.]

CROTCHET, in music, represents the fourth part of a semibreve in duration.

CROTON, now Cotrone, a town on the coast of Calabria, with a castle and a small port. The district of Cotrone, one of the four into which the province of Calabria Ultra II. is divided, contained, at the census of 1824, 37,175 inhabitants, chiefly employed in agriculture. Croton was one of the oldest and most flourishing Greek colonies in Magna Græcia. It was famed for the salubrity of its climate, the fertility of its territory, and the beauty of its women. During the second Punic War it was besieged by a combined force of Carthaginians and Bruttians, and the inhabitants, who were reduced to 20,000, were unable to defend the large extent of their walls. They surrendered, and afterwards sought a refuge among their ancient enemies the Locri. (Livy, xxiii. 30.) The Romans afterwards sent a colony to Croton. This town was the residence of Pythagoras.

CROTON, an euphorbiaceous genus comprehending a large number of species, many of which have important medical properties.

Croton cascarilla is a native of St. Domingo and Florida.

Cascarilla bark is yielded by the *Croton cascarilla* (Don), a tree or shrub growing in the vicinity of Jalapa. It most likely comes to Europe through the Bahama Islands, from one of which the appellation *C. eleutheria* is derived; but it is not yielded by any plant indigenous to these islands.

The bark occurs in pieces about a foot long. The colour externally is yellowish, ash-gray, or varying to reddish brown; this last colour is mostly owing to the presence of lichens. The inner surface is a dirty or rusty brown colour. Odour faintly aromatic: taste bitter, not unpleasant, and stimulating. No alkaloid has been detected in it, but it possesses much volatile oil. One pound of bark yields one drachm and a half of volatile oil. This bark is sometimes mixed with the cinchona barks, being called Gray Fever-Bark; a substitution in no respect hurtful.

The action of cascarilla on the human system depends partly on its bitter principle, and partly on its volatile oil; by the former it approaches the pure bitters, by the latter the aromatic stimulants. It possesses this great advantage over almost all other tonic medicines, that it is more easily digested by the stomach, when no other affection of that organ exists than debility and inactivity.

Powder or infusion is the best mode of administration; decoction is objectionable from its dissipating the volatile oil.

Croton tiglium, an inhabitant of the Moluccas, Ceylon, and other parts of the East Indies. This plant is at once the most active and dangerous of drastic purgatives; every part, wood, leaves, and fruit, seems to participate equally in the energy. The leaves are so acrid as to inflame the mouth, lips, and fauces of those who merely chew them, bringing on swelling, and producing a sensation of burning as far as the anus.

The seeds were formerly used as a drastic purgative medicine, under the name of Grains of Tilly, or Molucca Grains; but at present the oil only is employed. The seeds are roasted and then subjected to compression: the oil is therefore termed an expressed oil. The taste is at first slightly rancid, afterwards acrid, causing a feeling of burning in the throat for several hours.

A portion of the oil is taken up by alcohol, and more by æther; it is however soluble in every proportion in fixed and volatile oils. In the dose of one drop (when the pure oil is used) it produces considerable purgative effect, and may be very advantageously employed when difficulty of swallowing exists, since its application to the tongue is often sufficient to insure the purgative action. Hence in cases of apoplexy, or paralysis of the throat, the desired effect may be obtained even when the patient is insensible.

Croton lacciferum is a native of the East Indies. This species is said to furnish the finest of all the sorts of lac, but scarcely ever to find its way to England. It is very pure, of a bright red, and furnishes a brilliant varnish in Ceylon.

Croton Draco, a Mexican plant. *C. sphærocarpum*, and *C. sanguifluum* yield, when wounded, a resinous substance of a deep red colour, resembling dragon's blood. Others are merely aromatic. From *C. balsamiferum*, the liqueur called Eau de Mantes is distilled. *C. aromaticum, nivrum, fragrans*, and *coriaceum*, have similar qualities; and *C. thuriferum* exudes a fragrant resin analogous to incense.

CROTO'PHAGA, Linn. (*Crotophagus*, Browne, Brisson), a genus of zygodactyle or scansorial birds, found in the warmer portions of America and the Antilles. They are characterized by the bill being short, compressed, elevated, arched, and ridged above; nostrils basilary; tail long and rounded; fourth and fifth quills longest; feet with two toes before and two behind.

These birds are called *Ani* and *Anno* in Guiana and Brazil, and *Anno* in Paraguay. In Mexico they are named, according to Hernandez, *Cacalototl*, and in the Antilles *Bouts de Petun*, *Diables de Savannes*, and *Perroquets Noirs*. In Cayenne their common name is *Bouilleur de Canari*. Their colour is mostly black, with metallic reflections.

The Anis live in flocks, and are so far from being timid, that when they see their companions fall before the gun the survivors fly but a short way and settle again. Bushes, the skirts of woods, and the borders of flooded savannahs, are their favourite haunts. Their food consists of lizards, insects, and seeds. Many pairs are said to use the same nest, built on the branches of trees, and of large dimensions, and in this they lay and hatch their young in concert. These birds may be easily tamed, and even taught to speak. Their flesh is of a bad odour. One of the best known species is the *Crotophaga Ani*. It is rather less than a jackdaw, and inhabits the West India Islands, the Carolinas, Brazil, Paraguay, &c. It is the Razor-Billed Blackbird of Catesby, the Savannah Blackbird of the English colonists, and the Great Blackbird of Sloane.

CROUP, a specific inflammation of the mucous membrane of the air-tubes, giving rise to a peculiar secretion, which concretes almost immediately it is formed, producing a false membrane, which lines the affected parts.

The membrane, the result of plastic or croupal inflammation, moulds itself to the part inflamed; it does not extend beyond the inflamed portion of the mucous membrane; it varies in thickness from half a line to a line; it is of a white or whity brown colour; it has the consistence of boiled white of egg, and its firmness is always greatest where it is thickest. When it is raised from the mucous membrane, the latter is always found to be reddened and swollen, but rarely to the degree common in catarrh.

This morbid secretion is most commonly poured out on that portion of the windpipe which constitutes the larynx; hence in general the larynx forms the peculiar and proper seat of croup; but the site of this adventitious membrane is by no means confined to the larynx, it often extends above to the glottis and epiglottis, and below to the bronchial tubes.

It is remarkable that in general the seat of plastic inflammation is strictly limited to the larynx, trachea, and bronchi in children, and to the fauces in adults: hence children are by far the most subject to croup, while those of more advanced age are seldom or never attacked with croup as a primary disease, but with cynanche maligna, or gangrenous sore throat.

The symptoms of croup are very characteristic. The air-passage in the progress of the disease is often obstructed to such a degree as to produce a most painful *feeling of suffocation*, attended with all the signs that denote the imminent danger of suffocation, and death is constantly occasioned by the narrowing of the air-tube to such an extent as actually to produce suffocation. In milder cases, when not impeded to this extreme degree, the respiration is still always difficult, anxious, and distressing.

Owing to the diseased condition of the air-tubes, the acts of respiration and of coughing produce peculiar sounds. The inspiration is sonorous and ringing, as if the sound were formed and resounded in a brazen tube. Sometimes it is dry and hissing, resembling the sound produced by a piston forced through a dry pump, or by a crowing noise similar to that emitted by a chicken in the pip. The croupal cough is a peculiar, loud, clangous, ringing sound, which has caused it to be almost universally compared to the crowing of a cock. The voice partakes of the same character, being shrill and hoarse.

The fever excited in the system by this local inflammation is commonly acute and intense. The skin is burning hot; the face flushed, sometimes covered with perspiration; the eyes prominent, injected, or watery; the carotid arteries throb powerfully; the jugular veins are tumid, and the pulse at the wrist is frequent, hard, and wiry. Sometimes, on the contrary, the febrile symptoms are of a low or asthenic character; the skin cool, and of a dirty pallid colour; the pulse frequent, but exceedingly feeble; the breath fœtid; and the general prostration extreme.

Croup is chiefly prevalent in the neighbourhood of large bodies of water, running or stagnant, salt or fresh, and especially among the ragged and half-starved children of the poor, who live on the sea-coast, or near the banks of rivers or canals. But it also occasionally prevails in other situations as an epidemic, especially during the continuance of north or easterly winds, after heavy and long-continued falls of rain.

There is perhaps no disease to which the human body is subject the progress of which is so frightfully rapid. In a few hours after the attack, the morbid secretion is often formed to such an extent as to prove inevitably mortal; yet the inflammation of which it is the result might have been checked by immediate, vigorous, and judicious treatment.

If the diet of the child be changed from its ordinary food to that of the simplest and blandest kind, as gruel or arrowroot, the moment the hoarse cough and rough voice are perceived; if it be immediately placed and kept in bed in an equable and moderately warm temperature, and one grain or two grains of the powder of ipecacuanha be given every hour, or every alternate hour, all the symptoms may subside without any further remedies, and the threatened attack be effectually prevented.

When the disease has been allowed to establish itself, the prompt employment of the most powerful remedies is indispensable. When the fever is intense, the skin hot, the pulse full and hard, and the patient plethoric, bleeding must be employed, and carried as far as the strength will admit; but experience has amply shown that in this disease the strength will not admit of its being carried as far as is safe and even necessary in diseases purely inflammatory. Bleeding, either by the lancet or by leeches, which latter should never be applied to the throat itself, but to its immediate neighbourhood, is a most powerful auxiliary; but it is not *the* remedy to be relied on. *That* is mercury, which should be given instantly and efficiently, that is, in doses of from one to two grains of calomel every hour, or every two hours, until the mouth be affected, the breath fœtid, or the patient relieved. All agree that blisters are useful auxiliaries. The vomiting produced by the tartar emetic sometimes powerfully promotes the expulsion of the adventitious membrane.

CROW. [Corvidæ.]
CROW-SHRIKES. [Barita.]
CROWFOOT. [Ranunculus.]
CROWLAND. [Lincolnshire.]
CROWLE. [Axholme, Isle of.]

CROWN, the ornament of the head which denotes imperial or royal dignity, from the Latin *coróna*. The radiated appears to be the earliest form of the royal crown. It appears upon the heads of the figures which are represented upon the Persian darics: radiated crowns also occur on the coins of Antiochus IV. of Syria, and of his successors; on many of those of the Greek cities, and on those of the Roman emperors. The strophium, bandelet, or fillet, and the laurel wreath, were also used as crowns. In Constantine's time the fillet of pearls came into use; which the latter Byzantine emperors turned into

a kind of coronet. The trefoil appears on the crowns of Clovis and his sons, but these trefoils were used on Constantinopolitan crowns before the time of the Franks. Aubrey was of opinion that the fleur-de-lis is really a spear-head adorned, no flower of that kind having the middle part solid.

Crowns were placed on the statues and images of the heathen gods, as well as worn by the priests in sacrificing. Some antiquaries have even thought that the crown was originally rather a religious than a civil ornament; and that it only became common to kings, inasmuch as the ancient kings were priests as well as princes.

Among the Romans there were various kinds of crowns distributed as rewards for military and other achievements. The principal were the civic, the mural, the naval or rostral crown, the obsidional, and the triumphal.

CROWN-SOLICITOR. In state prosecutions in England the solicitor to the treasury acts as solicitor for the crown in preparing the prosecution. In Ireland there are officers called crown-solicitors attached to each circuit, whose duty it is to get up every case for the crown in criminal prosecutions. They are paid by salaries. There is no such system in England, where prosecutions are conducted by solicitors appointed by the parish or other persons bound over to prosecute by the magistrates on each committal. In Scotland there is a crown-prosecutor in every county, who prepares every criminal prosecution.

CROWN OF THE SUN, *Ecu d'Or au Soleil*, was a French coin, first struck by Louis XI. of France in 1475. They were for a time made a legal currency in England. By royal proclamation of 14 Henry VIII. their value was fixed at 4*s.* 4*d.*; in 1549, under Edw. VI., at 7*s.*, and again reduced to 6*s.* 4*d.*, at which they were continued by Queen Mary in 1553 and 1554.

CROWNE, JOHN, a play-writer, of the time of Charles II., was the son of an Independent preacher in Nova Scotia. He came to England, and had the equivocal honour of being brought forward by the Earl of Rochester as a dramatic rival of Dryden. The latter part of his life is very obscure; but he is believed to have died soon after 1703. He left in print seventeen plays. The tragedies are among the worst specimens of the corrupt taste which then ruled in the drama. His comedies are his best works, and have some merit in their portraiture of characters.

CROYDON. [SURREY.]

CROZO'PHORA TINCTO'RIA, a cinchonaceous plant, is a native of barren places all over the south of Europe, and is cultivated about Montpelier for the sake of the deep purple dye, called Tournesole, which it produces. Its properties are acrid, emetic, corrosive, and drastic, like the most virulent euphorbiaceous plants.

CRUCIBLE, a chemical vessel in which substances are exposed to high temperatures. Earthen crucibles are used in assaying ores; for these purposes the refractory kind, called Hessian or Cornish crucibles, are prepared. Black-lead crucibles, formed of about three parts of plumbago and one of good clay, are much employed, especially in melting metals. Glass-makers' crucibles are usually made of Stourbridge clay. Crucibles of silver and of platinum are employed in various chemical processes.

CRUCI'FERÆ, a very extensive and most natural assemblage of plants, called *Tetradynamæ* and *Cruciatæ* by Linnæus, and *Brassicaceæ* by others. It comprehends the mustard, cress, turnip, cabbage, scurvy-grass, radish, horse-radish, and similar plants, having a pungent volatile principle.

About a couple of thousand species are dispersed over the milder parts of the world, refusing alike to exist beneath the severe cold of the arctic zone and the excessive heats of the tropics. A large proportion consists of inconspicuous and useless weeds: many are objects of beauty, from the size and gay colours of their petals; and the names already mentioned show that another part of the order consists of plants useful to man. Their use as a condiment depends on their possessing an acrid volatile principle, and their anti-scorbutic action, according to recent researches, seems to depend on their containing potash.

CRUDEN. [CONCORDANCE.]

CRUSADES. Under this name are designated the religious wars carried on for two centuries between the Christians and Mohammedans. At first the Christians demanded only a free pilgrimage to the holy sepulchre, but afterwards the contest was for the possession of Jerusalem, and the wars had an important influence upon the civilisation of Europe. As long as the caliphs of Bagdad, and after them the Fatimides of Egypt, possessed Palestine, the Christians were not checked in the exercise of the religious practice of visiting the holy sepulchre; but, when the Turks had effected the conquest of Palestine, the hospitality of the Arabs gave way to the brutality of the new possessors; the Christians were subjected to so many vexations, that the whole of Europe re-echoed with the complaints of the pilgrims.

It was in 1095 that Pope Urban II. decreed the first Crusade. First at the Council of Piacenza, in March, afterwards at that of Clermont in Auvergne, in November, supported by the ambassador of the Emperor of Constantinople and numerous powerful lords, he proclaimed the sacred war, and appointed the 15th of August (1096), the Day of Assumption, for the departure of the army. The minds of the Christian warriors had been previously excited by the preaching of Peter of Amiens (the Hermit), and by the loud complaints of the Patriarch of Jerusalem, who, provided with letters of credit from the pope, travelled through Europe, and filled all classes of society with enthusiasm for this holy warfare. Those who determined to set out for the Holy Land wore on their breast the figure of a red cross, and hence the name of Crusaders. The first Crusade ended by the taking of Jerusalem in 1099, and the election of Godfrey of Bouillon to be its king; and the kingdom was transmitted to his successors till 1187, under Guido of Lusignan, when Saladin put an end to the Christian domination. The second Crusade was led by Louis VII. of France, and Conrad III., Emperor of Germany. It began in 1147,

consisted of 140,000 armed knights, and near a million of foot-soldiers; but it ended in a complete failure in 1149, chiefly through the opposition and intrigues of Manuel Comnenus, the Emperor of the East. The third Crusade, in 1189, numbered among its chief leaders the Emperor Frederic Barbarossa, Philip Augustus, king of France, and Richard Cœur de Lion, king of England. Dissensions among the leaders, and particularly between Richard and Philip, led, notwithstanding some brilliant successes, to the abandonment of the enterprise in 1192. The fourth Crusade, of which the chief promoters were the Venetians, principally occupied its force in conquering Constantinople, in order to restore Alexius, the son of the Emperor Isaac Angelos; but, after elevating and deposing several emperors, the imperial crown was placed on the head of Baldwin, count of Flanders, in 1204. Frederic II., emperor of Germany, undertook the fifth Crusade in 1227, and he succeeded in obtaining possession of Jerusalem by treaty with Melek Kamel, sultan of Egypt; he then returned home, and Jerusalem was retaken by the Turks in 1244. St. Louis (Louis IX. of France) led the sixth Crusade, in 1249. He took Damietta, and advanced towards Cairo, but was surrounded by the troops of the sultan, and taken prisoner with the remains of his army, which had been wasted by battle, sickness, and fatigue. Louis was afterwards ransomed, and in 1270 undertook another Crusade, but died on the shores of Africa. The seventh and last Crusade was undertaken by Edward I. of England; he effected nothing permanent, and soon returned home. Before the close of the 13th century, the whole of Palestine and Syria became a possession of the sultans of Egypt, and obeyed the laws of Mohammed.

There were other expeditions, also called Crusades, in the west of Europe: against the Moors in Spain, the heathens in Prussia and Lithuania, against the Waldenses and Albigenses in France, and others; but these differed from other civil wars only in the cruelty with which they were pursued.

Though the Crusades sacrificed the lives of several millions of Christians, among whom were many women and children, and though they were one of the causes which contributed to give the popes such an overwhelming power in Europe; although they were instrumental in bringing about the religious wars or persecutions which afflicted Europe, and also in weakening the power of the eastern princes, and rendering them unable to withstand the attacks of the Mongols; it cannot be denied that the Crusades were accompanied by many beneficial effects. Such, for instance, were the increased activity of political life in Europe; the breaking up of the feudal system, by the sale of estates to the merchants in exchange for the money required by the nobles for their military accoutrements and provisions; the increased wealth of the mercantile towns in Italy, which led to the revival of the fine arts and the sciences in that country; and, finally, the diffusion of more liberal modes of thinking in matters of government and religion, occasioned by the intercourse of the western and eastern nations. The great influence of the Crusades in extending commerce has been pointed out by Heeren, in his 'Essay on the Influence of the Crusades.'

(For more detailed accounts of the Crusades, see Wilken, *Geschichte der Kreuzzüge*, Leipzig, 1807; Mailli, *Esprit des Croisades*, Paris, 1780; Voltaire, *Histoire des Croisades;* Michaud, *Histoire des Croisades;* Bongarii *Gesta Dei per Francos;* Robert Mons, *Historia Hierosolomitana;* Albertus Acquensis, *De Passagio Godoffredi de Bullion;* Mill, *History of the Crusades;* Michaud, *Bibliographie des Croisades*, which gives an account of all the writers who have treated this subject.)

CRUSCA, ACCADE'MIA DELLA, a society of Italian philologists, who compiled the great Dictionary of the Italian Language, and who continue to discuss and decide upon questions concerning that language, its grammatical rules, and the choice, application, and etymology of its words. This academy, which is patronised by the Tuscan government, is generally looked upon by the Italians as the highest authority in matters of language. The great and laborious work of the academy, which Leonardi Salviati first promoted, but which was not completed till many years after his death, was the Dictionary which was published at Venice in 1612, at the expense of the academy, 'Vocabolario degli Accademici della Crusca.' It has since been enlarged and revised, and has gone through several editions, the last of which is that of Florence, 6 vols. fol., 1729–38, with another volume of Giunta, or additions, 1751. A reprint of this edition, with additions, was made by Pitteri, in 5 vols. 4to., Venice, 1763; and another by Father Cesari, with more additions, in 6 vols. 4to., Verona, 1806. All the additions however contained in these two editions have not received the approbation of the academy. The society has rendered an essential service to the Italian language by fixing its rules, and collecting its appropriate words from the best writers. It has also published very correct editions of Dante, Boccaccio, and other Italian classics.

The Academy della Crusca, having lost many of its most distinguished members, fell into comparative inertness in the latter half of the last century, when, by a decree of the Grand Duke Leopold I., it was merged in the new Florentine Academy in 1783. The Magliabecchi Library was assigned for the sittings of the new society. In 1811 Napoleon restored the Crusca Academy to its separate existence, with twelve resident and twenty corresponding members. When Tuscany returned under the sway of the Grand Duke Ferdinand, in 1814, he confirmed the institution of the academy, and assured it of his patronage. The academy then began to publish its acts, 'Atti dell' Imperiale e Reale Accademia della Crusca,' of which several volumes have since appeared. The first volume, 1819, begins with a concise history of the academy from its first foundation. Its sittings take place in the Palace Ricardi, formerly Medici, which was built by Cosmo the elder. Prizes are awarded by the

academy every five years. The prize of 1830 was given to the historian Botta, for his history of Italy during the French revolution and war.

The name Crusca means 'bran,' and the emblem of the academy is a 'frullone,' or sifting machine, with the legend, 'Il più bel fior ne coglie:'—'It gathers the finest part of the flour of the language.'

CRUSTA'CEÆ (*Crustacés* of the French, *Krustenthiere* of the Germans, *μαλακόστρακα* (malacostraca) of Aristotle and the ancient Greeks), a class of Cuvier's sub-kingdom ARTICULATA, containing an extensive group of animals, of which the lobster, the crab, the shrimp, &c. are familiar examples. The skeleton of the Crustacea is external; it is made up of the tegumentary envelope, which in some of the class always continues soft, but in the greater portion is very firm, constituting a shelly case or armour, in which all the soft parts are contained. In the more perfect Crustaceans it is complex. This tegumentary armour consists of a *corium*, intimately connected with a kind of serous membrane which lines the cavities of the Crustacea; of an *epidermis*, and *pigmentum* of a peculiar nature communicating to the *epidermis* the colours with which it is tinted. Both these are secreted by the *corium*, or true skin. This epidermic membrane is originally thin but tough, as is seen when the lobster or crab has cast its shell; but it becomes more or less infiltrated by a deposit of calcareous matter, with more or less *chitine*, *albumen*, and *pigment*, and then assumes the character of shell, replacing the shell previously cast off. In fact it is never found in the perfectly membranous state, save at the time of the Crustaceæ casting their old shell, which this tissue newly exuded is to replace, undergoing the process which made that cast-off shell what it was. The degree of hardness and amount of calcareous matter deposited within its tissue vary considerably: in some, as the shrimp, its structure is semi-corneous; in others, as the common edible crab, it becomes a dense solid plate. The colouring matter or pigment is in the greater number of species changed to red by alcohol, æther, the acids, and water at 212° Fahr. Thus, then, the tegumentary skeleton or armour of the Crustacea, hardened in different degrees, is merely a modification of the epidermis, which at the free joints of the limbs, &c., ever retains its pliability. This tegumentary armour consists of many pieces, or rings—normally twenty-one. Let us look at the lobster. We observe that the head and thorax are blended into one portion, called *cephalothorax;* this, according to Milne Edwards, consists of fourteen rings or portions, seven for the head, seven for the thorax, consolidated into one plate, called the carapace, forming a buckler. To this succeeds an abdominal portion (usually called the tail) covered with seven rings of armour, overlapping each other above, membranous below. They work on hinges, and of these the last may be regarded as the true tail ring, terminated by oar-like plates. In the brachyourous Decapods, as the Crab, the abdominal portion is small, and the cephalothorax extremely developed. The carapace is divided into regions, named after the viscera and

organs protected respectively by them, viz. the stomachic region, the genital region, the cardial region, the posterior hepatic region, and the branchial region.

The limbs, at least on the higher Crustacea, and taking the lobster as our type, are divided into three sets. On each side of the mouth are six limbs, termed jaw-feet (*pieds-mâchoires*), which are furnished with tentacular appendages. These limbs manipulate the food, turn it about, and apply it to the powerful jaws. Under the chest are based five pairs of true limbs; of these the first pair are often remarkably developed, possessing vast power, and the last joint presents us with pincers, or chelæ. In some Crustaceæ the chelæ are the same; but in the lobster they differ, the left pincer having its opposing edges finely dentated, for cutting or rending the prey: those of the right are bluntly tuberculated, and adapted for holding solid objects, or mooring the animal against a stone, or other convenient anchorage. The succeeding limbs are as a general rule comparatively small, but they exhibit many points of difference in various genera, and in many they are paddle-like. Along the under surface of the abdomen are certain articulated appendages, termed false feet, which are largest in the female, and enable her to affix the roe, or eggs, to the under surface of the abdomen: these in the lobster are arranged in five pairs; they are not used in locomotion. The anterior margin of the carapace generally projects, is often prolonged into a spine, is frequently dentated, and sometimes plain. The head is furnished with variable antennæ. The mouth, taking the lobster as our example, is very complicated. It is furnished, as described, with jaw-feet, and consists of two powerful mandibles, two powerful maxillæ, and two maxillary palpi. The shell forms a labium or sort of upper lip, but there is no distinct labium or lower lip.

The digestive organs are simple in the lobster and its allies; the gullet leads directly to the stomach, which is of considerable size; its pyloric portion is supported by strong calcareous pieces, and is further furnished with three hard grinding teeth, acted upon by strong muscles, the whole constituting an efficient apparatus for crushing and bruising. The alimentary canal is simple. The liver consists of two large masses inclosing the pylorus, and is composed of agglomerated clusters of minute sacculi.

With respect to the system of respiration, it consists of branchial appendages as a general rule; but the form, disposition, and variety of the apparatus, and in some cases the complexity of it, are very great. In the lobster, we find connected with the base of the jaw-feet and of the true feet a series of pyramidal tufts, consisting each of a stem covered with vascular filaments. These tufts or gills are shrouded beneath the carapace on each side, and fill a sort of chamber lined with a fine membrane. Each chamber freely admits the water by a wide fissure, while an orifice near the mouth allows its egress. This latter orifice is closed by a semi-membranous flap or flabellum, continued from the second jaw-feet, and so arranged that every motion of the jaw-feet tends to create a cir-

culation of the water imbibed. The movements of the true limbs also add to this circulation, and maintain a due current over the branchial surfaces. The stems of the branchial plumes inclose each an artery and vein.

Turning to the circulating system, still keeping the lobster in view, we find a heart of an oval shape, below the carapace; it consists of a single cavity, with strong muscular walls, and gives off several main arteries, which ramify over different parts. Of these main trunks, one goes to the stomach, antennæ, eyes, and mouth; another is ramified over the lobes of the liver; a posterior vessel supplies the muscles of the tail; while a thoracic vessel, directed downwards, sends a branch anteriorly to supply the limbs, jaw-feet, and branchiæ, and another branch posteriorly to supply the false feet. The blood returns from every part by a system of veins, or rather membranous canals, which merge into a series of extensive but shallow reservoirs along the dorsal region. The largest communicates with the heart by several short trunks, guarded at their entrance by valves. The blood poured into the heart would, then, appear to be of two kinds: 1st, venous blood; 2ndly, arterial blood from the branchiæ. Hence the blood sent through the arteries of the system generally must be of a mixed character. It must be observed that Milne Edwards and Audouin regard the heart as purely systemic, and that the venous blood is at once transmitted to the branchiæ, and thence returned purified to the heart by a series of vessels. It is however sufficiently established that, though the venous reservoirs send a portion of their blood to the branchiæ for renovation, they also send a portion through four valvular orifices into the heart, the valves being so constructed as to prevent its reflux during the action of the latter.

The nervous system is ganglionic, the ganglia being more or less contralised, according to the elevation of the respective groups.

As it regards the senses, that of *taste* is no doubt in considerable perfection, and is seated most likely in the tegumentary membrane that lines the mouth and œsophagus.

Smell is also enjoyed, but where the organ is seated is not ascertained. Perhaps this sense may be inseparable from that of taste; it may be the taste of effluvia dispersed through the water.

Hearing is at least in some degree of perfection. In the lobster, at the base of the larger antennæ, is a little vestibular cavity filled with a fluid, and covered by a tympanic membrane; it is penetrated by a filament of the antennal nerve.

The sense of *sight* is possessed by the whole class at some period of their lives, and in the great majority the organ is of a highly complicated structure. The parasitic Crustaceæ, which undergo a kind of metamorphosis, possess eyes in the early stage of their existence, though they are subsequently obliterated; but the great mass of Crustaceans are gifted with the sense of *sight* from their birth to their death. The eyes are—1st, *smooth* or *simple*, without facets; 2ndly, *intermediate*, with the cornea undivided externally, but with a small number of crystalline lenses and vitreous humours, each in its separate pigmentary sac; and 3rdly, *compound*, the cornea being divided into numerous facets, each being a distinct eye. The position of the eyes differs in the various groups; in some they are immoveable and sessile, in others supported on moveable peduncles. The sense of *touch* appears to reside in the antennæ, according to the observations of Milne Edwards; these vary in length, slenderness, and the power of mobility.

In all the Crustaceæ the sexes are distinct, and the females are oviparous: many Crustaceans, and especially those of the lower class, which may be said to be hatched prematurely, pass through a series of singular changes before they reach their final state; indeed, it has been asserted by many physiologists, that even the decapod Crustaceans undergo several metamorphoses after exclusion from the egg before they obtain their permanent figure. Mr. Thompson in the 'Philosophical Transactions' describes the changes in the common crab, the newly hatched young of which, according to him, differs so much from the adult as to have been placed in a very distinct group of Crustaceans, and described under the specific name of *Zoea pelagica*. The question however is by no means decided. Rathke, who has elaborately traced the development of the Crayfish, asserts that the Decapods, as far as he has examined their habits and economy, do not undergo the changes described by Mr. Thompson in the case of the crab, adding, that at the end of their existence in the egg they have exactly the same aspect, and are as fully developed, except as to size, as the full-grown individuals. ('Ann. Nat. Hist.,' 1837.) Mr. Westwood has dissected the eggs of the Land Crab of the West Indies, and also denies the fact of any metamorphosis in that species. ('Phil. Trans.,' 1835.)

Among other curious facts in the history of the Crustaceæ, we may notice the power they possess of reproducing their limbs when lost by accident. The loss of a leg *seems* to be of but little importance; indeed, when suddenly alarmed, a lobster will frequently throw off a claw with a sudden jerk; and, when a limb is injured, the animal generally breaks it off at the second joint from the trunk, where the growth of the new limb most speedily takes place. No pain appears to attend this strange operation. The wound becomes covered with a delicate pellicle, and a new claw is in due time produced; it remains unprotected by a hard shell until the next general moult, and seldom or never acquires the size of the corresponding claw, although it is perfect in all its parts.

We have once or twice mentioned the moult, exuviation, or *ecdysis*, of the Crustaceæ. It appears to be undergone by all the species. Imprisoned in their armour, which cannot grow, the necessity of frequent changes of it, in order to allow the body to develope in size, is imperative. Hence this process is more frequent in the young than in the older animals; and indeed, when complete fulness of size is attained, no further moult appears to take place. Strange to say, it is not only the shelly plates that are cast off, but also the covering of the eyes and antennæ, the lining membrane

of the stomach, the teeth connected with it, and also the calcareo-tendinous expansions to which the muscles of the claws are attached. Released from its hard encasement, the soft body suddenly pushes forth its growth, a new epidermis has been secreted beneath the old shell; in due time it becomes consolidated into a coat of mail, to be again and again changed for a fresh covering. The time occupied in throwing off the shell varies in different species and under different conditions of atmosphere; and this observation applies equally to the number of days required for giving the new tegumentary sheath the consistency of the old shell. [ASTACUS; BRANCHIOPODA; CRAB.]

For full details relative to the anatomy of the Crustaceæ, we must refer to the works of Rathke, Lund, Audouin, Milne Edwards, Cuvier, Mr. Newport, and the 'Cyclopædia of Anatomy and Physiology.'

With respect to systematic arrangement, almost every writer on this class of animals has embodied his own views. Among the principal zoologists who have written on the subject, the names of Cuvier, Desmarest, Latreille, and Leach, with many others, may be mentioned. Milne Edwards divides the whole order into two *primary* sections according to the characters of the mouth. His *first* section he again divides into two great groups, *Maxillosa*, or *Mandibulata*, and *Edentata*, or *Haustellata*, which are again subdivided. The *second* of his *primary* sections contains but one group, *Xyphosura*.

Fossil Crustaceæ.—Crustaceæ occur in a fossil state throughout the series of fossiliferous beds. One form now extinct appears to have been among the earliest of the created beings whose remains have been preserved to us. The Trilobitic type is to be traced from the oldest fossiliferous strata to the coal-measures; and the Decapoda have been found below the chalk, in the chalk, and in some of the most recent deposits. Even the branchiæ and eyes of some of these fossil Crustaceans are in a high state of preservation.

CRUTH, or CRWTH, a musical instrument of the violin kind, formerly much used in Wales. It had six strings, and was somewhat of the lute form.

CRUX, a southern constellation formed out of Halley's observations, by Augustin Royer, in his maps, published in 1679. It is situated close to the hinder legs and under the body of Centaurus.

CRYOLITE is a fluate of soda and alumina; it is of a white colour, or reddish, or yellowish brown, and its streak is white. It occurs in crystalline masses. It is not so hard as fluor spar, is translucent, and by immersion in water becomes transparent.

CRYO'PHORUS, an instrument invented by Dr. Wollaston for the purpose of exhibiting the congelation of water in consequence of evaporation. It consists of two glass bulbs connected by a bent stem. One of the bulbs, if cooled when empty, causes water to freeze in the other, the stem being in vacuo.

CRYPT, a low-vaulted chamber, the vaulting of which is supported on columns and the basement walls of a church or cathedral. Some crypts have become the receptacle of the monuments of the dead, as at the abbey of St. Denis. Crypts are far from being common to all churches and cathedrals.

CRYPTOCE'PHALUS (Geoffroy), a genus of coleopterous insects of the section *Cyclica* and family *Chrysomelidæ*. Upwards of twenty species of this genus are found in this country; of these the *Cryptocephalus sericeus* is the most abundant. This little beetle is of a brilliant golden green, and is found, during the month of July, in the flowers of the *Hieracium* and similar plants.

CRYPTOGA'MIA, the twenty-fourth class of the Linnæan system of plants. It includes all those genera the flowers of which are either altogether absent or formed upon a plan different from that of ordinary plants. Ferns, mosses, lichens, algæ, fungi, with their immediate allies, form the class, which is the same as the *Acotyledons* of Jussieu, and the *Cellulares* of De Candolle.

CRYPTO'PHAGUS (Herbert), a genus of coleopterous insects of the family *Engidæ*. They are minute beetles, which are found in fungi and in flowers; some of the species are common in damp cellars. About sixteen species have been found in this country.

CRYPTORHY'NCHIDES (Schönheer), a family of coleopterous insects (section *Rhyncophora*), the species of which are chiefly distinguished by the presence of a groove in the chest, into which the rostrum is received when at rest. The family contains upwards of twenty genera, of which *Cryptorhynchus* may be considered as the type. Of ninety species which it is known to contain, only one (*C. Lapathi*) is British.

CRYSTALLINE LENS. [EYE.]

CRYSTALLO'GRAPHY, or the doctrine of the relations of crystalline forms, is allied to mineralogy, and may be regarded as a subsidiary department of that science.

Minerals occur very generally in the state of crystals, that is, in certain definite and symmetrical forms; and these are regarded as crystals, whether they are transparent or opaque.

In order to classify crystals, mineralogists have adopted certain groups of *primary* and *secondary* forms. The primary forms, according to one system of crystallography (for there are more systems than one), consist of the *cube*, the *square prism*, the *right rhombic prism*, the *oblique rhombic prism*, the *doubly oblique prism*, and the *rhomboid* or *rhombohedron*. The nature of these forms may be best explained by showing the relations between them. The *cube* has the well-known form of a die, with six equal surfaces. If the lateral edges of the cube be supposed to be longer or shorter than the terminal edges, a *square prism* would be produced; if two opposite lateral edges of a square prism could be pressed towards each other, the parallelism being kept, a *right rhombic prism* would be formed; if this prism could be pressed in the direction of either of the diagonals of its terminal plane, so as to make the figure overhang the base in that direction, an *oblique rhombic prism* would be represented; and if again pressed in the direction of the other diagonal, so that it should overhang the base in both directions, a *doubly oblique prism* would be

formed. If a cube be made to stand on one of its angles by placing the fingers on an opposite one, and if, while held in this position, the two angles could be pressed nearer together or drawn further apart, the altered cube would become a *rhomboid*.

Crystals are more generally met with in secondary than in primary forms, so that the primary must be inferred from the secondary. It is supposed that these modifications of the primary are occasioned by some natural influence operating upon the first germ of the crystal, and continuing during the period of its increase in size. Secondary crystals are sometimes altered from the primary only by single sets of planes replacing some of the angles or edges; in other cases both the angles and edges are replaced by planes in the same secondary crystal; and, in others, several different sets of planes appear replacing the angles and edges of the same crystals, and producing very numerous and complicated secondary forms. The number of known secondary forms belonging to each system is already very great; in one mineral, carbonate of lime, they amount to many hundreds. *Twin crystals* are produced by the union of two or more crystals according to some regular plan, so that, if any number of twin crystals of the same kind of mineral should be found, they would be fashioned in the same manner. The secondary forms of crystals are not derived from the primary by accidental and indefinite truncations of the angles and edges, but according to known and definite laws. There are irregular forms called *hemi*, *epigene*, and *pseudomorphous*. The laws according to which any secondary planes are produced are termed the laws of those planes; and the investigation of these laws constitutes the mathematical part of crystallography, which has been extensively treated of by Haüy, Möhs, Whewell, Miller, and others.

Crystallisation and the circumstances under which it takes place form an interesting subject of inquiry, not only in respect of the variety of figures under which crystals present themselves, but in relation to geological processes of formation. Natural crystallisation is too slow a process to be satisfactorily watched; and therefore our only sources of information relative to the formation of crystals are those afforded by the processes of artificial crystallisation, which have been largely increased in number within the last few years by electrical agency.

The crystallisation of salts from solution in fluids generally takes place when the solutions are considerably evaporated, but the degree of evaporation is very different for different substances. Some salts begin to crystallise at the surface very soon after evaporation commences; and others (for example, sugar) must be evaporated to the consistence of a thick syrup before any crystals will be formed. Hot fluids will generally dissolve more matter than cold ones, and crystals are frequently produced during the cooling of the hot solution. Some soluble substances however cannot be brought to crystallise under any circumstances hitherto tried; but, on the solvent evaporating, a thick pasty matter is left, which by further evaporation becomes a hard solid mass. Camphor affords an instance of the formation of crystals by volatilisation. The slags of furnaces will frequently be found to contain crystallised matter; and the common rolls of sulphur when broken will frequently present small cavities lined with thin needle-like crystals. Becquerel, Crosse, Fox, and others, by the electrical induction of chemical action, have effected the crystallisation of mineral bodies which are wholly insoluble in any fluid which does not subject them to immediate chemical change.

CSABA. [HUNGARY.]

CSONGRAD. [HUNGARY.]

CTENACA'NTHUS, a genus of fossil placoid fishes, from the mountain limestone and old red sandstone. (Agassiz.)

CTENODAC'TYLA (Dejean), a genus of coleopterous insects of the section *Geodephaga* and subsection *Truncatipennes*. Dejean, in his 'Catalogue des Coléoptères,' only enumerates three species from Guiana, but others are known.

CTENODAC'TYLUS, a genus of rodent Mammalia of the family *Arvicolidæ*, established by Mr. Gray.

Generic Character.—Each foot with four toes only, and an obsolete clawless wart in the place of a thumb; claws small and falculated; toes pectinated internally with small bony appendages; tail very short and hairy. *Dental formula*:—

$$\textit{Incisors}, \frac{2}{2}\ ;\ \textit{Molars}, \frac{3—3}{3—3}\ \text{(Gray)}.$$

Example.—Masson's Comb-Rat (*Ctenodactylus Massonii*). This little animal, which is about nine inches long, with a tail of one inch, is a native of the Cape of Good Hope; it is covered with soft silky fur, fulvous brown above, whitish below. Speaking of the comblike appendages of the feet, Mr. Gray says, 'I am not aware of the same kind of process being found on the toes of any other of the mammalia. It nearly resembles the pectinated edge of the claws of the middle toes of the feet of the goatsuckers and herons; it may be used for the same purpose, to clear their coats of intruding insects; and this idea is strengthened by the fact of two living animals in the collection of the Zoological Society, said to come from Barbary, continually scratching themselves with their hind claws. Some of the Lemmings, to which these animal are most nearly allied, are peculiar for having a very curious conformation in the claw of the index finger of the hand.' (*Spicilegia Zoologica*, pt. i.)

CTE'NODUS, a genus of fossil fishes, from the coal formation of Yorkshire and Lancashire, and the limestone of Burdiehouse. (Agassiz.)

CTENOID FISHES, a great division of fishes, thus named by Agassiz from the pectinated appearance of the retral edges of the scales, which are of a horny substance, not bony nor enamelled. Abundant in the actual creation, they are rare as fossils in all but the more recent strata.

CTENO'LEPIS, a genus of fossil fishes, from the oolite of Stonesfield. (Agassiz.)

CTENO'STOMA (Klug), a genus of coleopterous insects of the section *Geodephaga* and family *Cicindelidæ*. Several species are known, all of

which inhabit South America. One species (*Ctenostoma macilentum*) is about half an inch in length, and of a brassy black colour; the elytra are distinctly punctured, and have a transverse yellowish fascia in the middle; legs yellowish. Three other genera, *Therates*, *Tricondyla*, and *Colliurus*, are related to the present. The species of the first are from Java and Guinea, of the second from the islands north of Australia, and of the third from the southern parts of Asia, and the islands north of Australia.

CTE'SIAS was a Greek physician and historian, who lived about the end of the 5th century B.C. He spent seventeen years of his life at the court of Artaxerxes Mnemon. It appears from Xenophon and Plutarch ('Anab.,' i. 8, s. 27; 'Artaxerxes,' c. xi.) that Ctesias was one of Artaxerxes' immediate attendants at the battle of Cunaxa, B.C. 401. Ctesias wrote—1. Persian History, in twenty-three books, of which the first six treated of the Assyrian monarchy, and the remainder carried down the history of Persia to the year 398 B.C. (Diod., xiv. 46; and the end of the Persica in Photius.) 2. Indian History, in one book. 3. A Treatise on Mountains. 4. A Description of Sea-coasts. 5. On the Revenues of Asia. 6. On Medicine. Many fragments of his historical writings, especially of the Persian History, are preserved in the 'Myriobiblon' of Photius. There are also Fragments in Diodorus, Ælian, and other writers. The latest edition of the Fragments of Ctesias is by Bähr.

CTESI'BIUS, an Alexandrian Greek, who lived about B.C. 120-150, the instructor of Hero (according to Pliny), and the inventor of various hydraulic and other machines, according to Pliny, Vitruvius, Philo of Byzantium, and Athenæus. This is all we know of Ctesibius, except that he wrote various works, which are referred to by Vitruvius, and cited (cap. i.) with those of Archimedes, where mention is made of authors on physics.

Of the clepsydra we have already spoken. [CLEPSYDRA.] The remaining inventions attributed to Ctesibius are the water organ, mentioned by Pliny and Vitruvius, a pump for raising water, described by Vitruvius, and, according to Philo of Byzantium, a machine similar in principle to the air-gun. But all these contrivances are imperfectly described, except the pump, which was like what we now call a forcing pump. The water was raised by exhaustion into a cylinder with an entering and an issuing valve; it entered by means of the former, and was expelled through the latter by the descent of the piston.

CTE'SIPHON, a town of Assyria, on the eastern bank of the Tigris, a little below Seleucia, and 18 or 20 miles from the present Bagdad, was the winter residence of the kings of Parthia. The town appears to have been founded by Vardanes. (Ammianus Marcellinus, xxiii. 20.) Ctesiphon was destroyed by the Emperor Severus, A.D. 198. Near this place are some remains, especially the Taak Kesra, of which a particular description is given by Ives.

CTESIPHON. [ÆSCHINES; DEMOSTHENES.]

CUBA is the largest of the islands which constitute the Columbian Archipelago. It lies between 74° 11′ and 84° 58′ W. long., and between 19° 47′ and 23° 9′ N. lat. The greatest length is about 790 miles; the width varies from 28 to 127 miles; so that the island has a very elongated shape. The area is about 43,000 square miles. The coast-line of Cuba is above 2000 miles, but hardly one-third of it is accessible to vessels; the remainder is surrounded by banks, reefs, and rocks.

Only the south-eastern part of the island is mountainous, that which lies between the Cabo de Cruz, Cabo Maysi, and the town of Holguin. This mountain group is called Sierra or Montañes del Cobre (Snake Mountains), and probably in its highest parts rises more than 7200 feet above the sea. A few minor mountains occur in other parts. Along the southern coast large tracts of low country occur. The whole space between Batabano and Xagua is nothing but a low swamp, which extends three or four miles inland.

There are no large rivers in Cuba. Some are navigable a few miles inland for small boats; others are used for irrigating the adjacent fields.

The climate of Cuba is for the most part temperate, compared with that of some other islands in the same latitude. No snow is ever known to fall, either on the Lomas de San Juan, or on the Sierra del Cobre. Hail-storms are rare; they occur only once in fifteen or twenty years, and always with S.S.W. winds. Hurricanes are less frequent in Cuba than in Jamaica and the other Antilles. Sometimes none occur for six or eight years. They vent their fury more on the sea than on the land, and happen more frequently on the southern than on the northern coast. Cuba is exposed to the boisterous north winds (los nortes), which blow particularly during the cold months. No month of the year is free from rain; the greatest quantity falls during May, June, and July. Earthquakes frequently occur.

The aborigines who inhabited Cuba in the time of Columbus were annihilated before the year 1560, though the Spaniards settled in this island only in 1511. The population was estimated in 1775 at 170,000; in 1827, at 729,000, of whom 287,000 were slaves; in 1841, at 1,007,624. This last number was thus made up:—

Whites . . .	418,291
Free coloured . .	88,054
Free negroes . .	64,784
Coloured slaves . .	10,974
Negro slaves . .	425,521
	1,007,624

This population however is not distributed over the island, but gathered about the most fertile localities; indeed, nearly four-fifths of Cuba are very thinly inhabited. The most populous portion is near the western extremity.

The cerealia of Europe are not cultivated in any part of Cuba, and a great quantity of flour is consequently imported from the United States for the consumption of the white inhabitants. The slaves and people of colour live principally on mandioca, yams, bananas, maize, potatoes, sweet potatoes, &c. The objects raised for consumption and exportation are sugar, coffee, tobacco, cotton,

cocoa, and indigo; but the last three on a very small scale. As immense tracts are not cultivated, but only used as pasture-ground, the number of cattle is very great, and hides form an article of exportation. About 2,000,000 acres, or one-fourteenth of the whole surface of the island, is under cultivation. The uncultivated part contains large prairies of great fertility, on which great numbers of cattle pasture; but the greatest part is overgrown with large forest-trees, some of which supply excellent timber for ship-building. Gold and copper have been found in the Sierra del Cobre.

Cuba is divided into three provinces or *Intendencias*, the Western, the Central, and the Eastern. The whole island contained, in 1841, 22 cities and towns, 108 villages, 96 hamlets, and 279 rural districts. The Western Province, besides the capital of the island [HAVANA], contains the towns of Matanzas (19,000 inhabitants), Guanabacoa, and the Isla de los Pinos, with about 5000 inhabitants. The Central Province, which is the most fertile, contains the towns of Santa Clara, Santo Espiritu, San Juan de los Remedios, Trinidad de Cuba, Fernandina de Xagua, and Santa Maria do Puerto Principe. The last-named is the capital of the province, and contains a population of about 24,000: formerly it was much more. The Eastern Province contains the ancient capital, Santiago de Cuba, with about 26,000 inhabitants; and the harbours of Manzanillo, Baracoa, and Gibara.

In few countries has commerce increased so rapidly as in Cuba. About 1780 the exportation of its own produce amounted to little more than two millions of Spanish dollars in value: in 1760 the produce of sugar and coffee together amounted to 5,000,000 lbs.; in 1800, to above 40,000,000 lbs. In 1820 the exports of these articles reached 100,000,000 lbs.; and in 1847 the quantity of sugar alone exported had advanced to 256,800 tons, or 575,232,000 lbs. In 1842 the exports of Cuba amounted to 26,000,000 dollars. Havana is by far the largest port for foreign trade. The chief articles of importation are provisions, particularly flour, rice, and maize, butter, cheese, candles, tallow, jerked beef and hams, and salted fish and cod. Brandy and the wines of Spain, France, Portugal, and Germany also form a considerable branch of importation. Upwards of 45,000*l.* worth of machinery and mill-work was imported from England during the four years ending with 1847. As Cuba has no manufactures, cotton stuffs, woollen goods, linens, hardwares, and silk stuffs, are imported to a large amount. The imports and exports in 1842 were as follow:—

	Dollars.
Imports in Spanish vessels . .	15,398,430
„ Foreign „ . .	9,239,089
	24,637,519
Exports in Spanish vessels . .	6,072,813
„ Foreign „ . .	20,611,789
	26,684,602

Of the whole exports, rather more than one-third were to England, and one-fifth to the United States. Of the whole imports about one-eighth were from England, and one-fourth from the United States. The recent change in the Sugar Duties has largely increased the English consumption of Cuba Sugar: other commercial statistics of the island are given under HAVANA.

The internal traffic, formerly impeded by the badness of the roads, is much facilitated by the introduction of railroads, of which there were 800 miles open in 1847; the coasting-trade is active, four thousand small vessels being used to bring the produce of the neighbourhood to Havana alone.

The political importance of Cuba does not rest on its extent and productions alone, but principally on its position with respect to the common routes of navigation; for the trade winds and the gulf stream so affect the navigation of those parts, that the possession of Cuba gives an absolute control over the trade between Europe and all countries lying about the Caribbean Sea and the Gulf of Mexico, and consequently a great portion of the United States of America.

Cuba was discovered by Columbus *on his* first voyage in 1493; in 1511 the Spaniards formed the first settlement. *Since that* time the island has remained *in their possession.* In 1762 the *English took Havana*, but it was restored to *Spain* by the peace of 1763.

(Humboldt; Ramon de la Sagra; *Notes on Cuba*, 1845; *Parliamentary Papers*, &c.; Macgregor's *Statistics.*)

CUBE (*κύβος*), a solid figure contained by six equal squares; a box of equal length, breadth, and depth.

Owing to its being the most simple of solids, the cube is the measuring unit of solid content, as the square is that of superficial content, or area. Whatever the unit of length may be, the unit of solidity is the cube which is a unit every way: thus we have the cubic inch, the cubic foot, &c.

Cubes of different sides are to one another as the algebraical third powers of the number of units in their sides: thus cubes which are as 7 to 10 in their sides are as $7 \times 7 \times 7$ to $10 \times 10 \times 10$ in their contents.

For the celebrated historical problem connected with this article, see DUPLICATION OF THE CUBE.

CUBEBS. [PIPER CUBEBA.]

CUBIT, a measure of length in use among the ancients, and more especially among the Jews. The cubit was originally the distance from the joint or bending of the elbow to the extremity of the middle finger. Bishop Cumberland and Pelletier fix the Hebrew cubit at twenty-one inches; but it is more usually considered as a foot and a half.

The best authorities assert that there were two cubits in use among the Hebrews; one sacred, the other common. In Ezekiel, chap. xl. 5, and xliii. 13, we find the cubit for measuring the temple was a *cubit and a hand-breadth*; whence it appears that the larger cubit was longer than the common one by a hand-breadth, or three inches. Thus we may reconcile the two lengths of

eighteen and twenty-one inches already specified. Among the Greeks the cubit (*péchus*) was twenty-four fingers (δάκτυλοι). See Herodotus, ii. 175. (Arbuthnot, *Tables of Coins, Weights, &c.*, and Calmet's *Dict. of the Holy Bible*, in voce.)

CUCKFIELD. [Sussex.]

CUCKING-STOOL. [Tumbril.]

CUCKOO. [Cuculinæ.]

CUCU'BALUS, a genus of plants belonging to the natural order *Caryophyllæ*. There is only one species of this genus. *C. baccifer*, the Berry-bearing Campion. It differs but little from the species of *Silene* except in its berried capsule, which is black. It is a native of Europe, and has been found wild in Great Britain. It has been undoubtedly introduced, but is scarcely naturalised.

CUCU'LIDÆ (*Cuckoos* or *Cuckoo Tribe*), a family of birds belonging to the scansorial or zygodactylous order, and placed by Vigors and Swainson among the aberrant group, between the *Certhiadæ* and the *Rhamphastidæ*. The genera are numerous, and the restricted genus *Cuculus* may be regarded as the typical form. Referring to variations of external characters presented by the genera of this family, Mr. Vigors observes that some genera are associated with the true *Cuculus* by their curved and slender bill; others, like *Indicator*, Vieill., have a shorter and stronger bill; while *Saurothera*, Vieill., by its serrated bill, evinces an approaching conformity to the *Rhamphastidæ*, and a considerable number such as *Centropus*, Illiger, *Phœnicophaus*, Vieill., and *Crotophaga*, Linn., indicate the same affinity by the gradual increase of the bill in length and size. The last-mentioned genus, it may also be added, bears a relation, through the medium of *Scythrops*, to the *Hornbills*; some species of that family, and one more particularly, lately discovered (*Buceras Leadbeateri*) in the interior of Africa, possessing, though with gigantic dimensions, the exact bill of the Ani. [Crotophaga.] Mr. Swainson, who paid much attention to this family, thus characterises it:—Feet not strictly scansorial, very short; nostrils naked; tail-coverts remarkably long. He separates the group in the following sub-families; *Cuculinæ*, *Coccyzinæ*, *Saurotherinæ*, *Opisthocominæ*, *Indicatorinæ*. Of the first family *Cuculus*, Linn., is the type; of the second *Coccyzus*, Vieill.; of the third, *Saurothera*, Vieill.; of the fourth, *Opisthocomus*, Hoff.; of the fifth, *Indicator*, Sparrm. In the third and fifth parts of the 'Magazine of Zoology and Botany' (1836, 1837) will be found two memoirs by Mr. Swainson, on the natural history and relations of the family of *Cuculidæ*, in which that ornithologist's views are explained at length, and an account given of the habits and manners of the Brazilian Cuckoos (*Coccyzus*) in their native forests.

Warm and temperate climates are the chosen haunts of the cuckoos; it is only during the warmer months that the common cuckoo shows itself in our quarter of the globe, returning in the autumn to the woods of Northern Africa. The greatest number of species are intertropical. Their food consists of soft insects and larvæ, together with tender fruits. The typical cuckoos are all parasitic: they deposit their eggs in the nests of other birds, to which they commit the care of hatching and rearing their offspring. The cow-bunting of America (*Molothrus Pecoris*) acts in a similar manner.

CUCULI'NÆ.—Mr. Swainson's name for the sub-family of the Cuculidæ, which comprises the true Cuckoos.

The following are the characters of this sub-family:—Bill wider at the base than high, rather suddenly contracted behind the nostrils and becoming compressed; upper mandible slightly sinuous at the tip; wings long and pointed; tarsi very short, and thickly clothed with feathers for nearly half their length; toes zygodactyle, the outer hind toe partly reversible, the two anterior toes joined at the base; nostrils basal, and margined by a naked membrane. Habits parasitic as a general rule.

The following genera are comprehended under *Cuculinæ*.

Genus *Cuculus*.—Of this genus the common Cuckoo (*Cuculus Canorus*) is the type. This migratory bird is the κόκκυξ of the Greeks, *Coccyx* of the Latins, *Cucculo* and *Cucco* of the modern Italians, *Cocou*, *Cocu*, and *Coucou* of the French, *Kukuk* of the Germans, *Gok* of the Swedes, *Gjoeg* of the Danes, *Gouk* of the Norwegians, and *Cog* of the ancient British, *Gowk* provincial English. This bird arrives in England generally about the middle of April, and departs late in June or early in July. In every language its well-known notes have suggested its name. In its habits it is shy and recluse, and its voice may be often heard whilst the eye seeks in vain to discover the utterer. The food of the bird consists of caterpillars, especially the hairy kinds, and various insects, as dragon-flies, which, according to White, it not unfrequently takes upon the wing ('Hist. of Selborne'). The nests of the birds selected by the cuckoo for the reception of her eggs, and which she most probably conveys in her wide bill, belong always to insectivorous species, as the hedge-sparrow, the wagtail, the whitethroat, the titlark, and others. A single egg only is deposited in each nest, and the young cuckoo, in due time, ejects its

Cuckoo (*Cuculus canorus*). Male.

companions, and occupies alone the nest and the care of its fosterers. We may observe that the eggs of the cuckoo are very small comparatively to the size of the bird, scarcely exceeding those of the

common chaffinch. Many instances are on record of young cuckoos having been kept for some time in captivity, but none have lived to maturity. They always preferred the hairy caterpillars of lepidopterous insects (moths and butterflies), and indeed the stomach of the adult cuckoo is generally found coated with hairs derived from this source. (Mr. Thompson's communication in 'Proceedings of the Zoological Society,' 1834, p. 29.)

It is the male cuckoo only which utters the well-known call-note; the voice of the female is a mere chattering. This bird is too well known to require a detailed description; we may observe however that the plumage of the young, rufous barred with dusky, is very different from that of the adult, insomuch that Brisson regarded the immature bird as a distinct species, and termed it *Cuculus rufus;* it is the *Cuculus hepaticus* of Latham.

For a complete history of the cuckoo, Dr. Jenner's paper in 'Phil. Trans.,' 1788, Montagu's 'Dictionary,' White's 'Nat. Hist. of Selborne,' Selby's 'Ornithology,' Yarrell's 'British Birds,' and other works, may be consulted.

The Cuckoo was considered by the Romans a delicacy for the table. (Pliny, x. c. 9.)

Genus *Oxylophus* (Sw.).—In this genus the head is crested, the tail very long, and the tarsi moderate and naked.—Locality, the old world. Parasitic. Type, *Oxylophus Levaillantii.* This species is a native of Senegal and Western Africa. According to Mr. Swainson, it rears and provides for its young in the ordinary manner.

Genus *Erythrophrys* (Sw.).—Head not crested. Locality, America. Not parasitic.—Example, the Yellow-Billed or Carolina Cuckoo (*Erythrophrys Carolinensis*), *Cuculus Carolinensis*, Wilson; *C. Americanus*, Linn.; *Coccyzus Americanus*, Bonap. This species is migratory in its habits, rapid and silent in its flight, and appears in loose flocks on its southward passage, but returns northwards singly. It frequents the deepest shades of the wood, and builds a flat nest like that of a wood-pigeon on the fork of a branch. The eggs are four or five in number, of a bright green. Its note is dull and unmusical, not unlike those of a young bullfrog. Its food consists of caterpillars, butterflies, and other insects, as well as berries. For a full account we refer to Wilson's 'American Ornithology,' and Audubon's 'Ornithological Biography.'

Genus *Chalcites* (Less).—General form as in *Cuculus;* plumage of the most brilliant metallic green or bronzed green. Locality, Africa.—Example, *Chalcites auratus.* These beautiful little shining cuckoos, of which there are four or five species, perhaps many more, are at once characterised by their diminutive size and refulgent plumage. They are parasitic in their habits. See Le Vaillant's 'Travels in Africa.' The *Chalcites auratus* is the *Didric* of this traveller.

Genus *Eudynamys* (Horsf. and Vig).—Bill strong and thick; wings pointed; tarsi very short, and plumed above; tail-coverts full and soft. Locality, the old world.—Example, *Eudynamys orientalis* (*Cuculus orientalis* of authors). This species is the Eastern Black Cuckoo, and the Mindanao Cuckoo of Latham. The male is black, with a metallic lustre; the bill is yellow. The female is shining greenish brown, spotted with white; the tail-feathers banded with white; the under parts are whitish, undulated with greenish brown. This is Latham's Mindanao Cuckoo, but it is now regarded as the female of *E. orientalis,* although it presents so great a distinction in colouring from the Eastern Black Cuckoo of that author.

CUCUMBER, a kind of trailing annual, whose unripe fruit is used for salads and pickles. The finest cucumbers are always obtained from shaded plants growing in a warm damp atmosphere, and therefore growing rapidly; this is exclusively owing to the ordinary action of solar light being prevented.

When it is an object to procure very fine and long fruit, the plant should not be allowed to bear early. All the female blossoms should be destroyed until the plant has become vigorous and well rooted in the bed. A fruit set after that time will grow much faster than one fertilised at an earlier time.

The best sorts of cucumbers are, for gherkins, the Russian; for stewing, the Large White Bonneuil; for large size, the Longford; and for ordinary forcing purposes, the black-spined Long Prickly, if well saved. A small sort called the Sandy Cucumber is grown in the fields in some parts of Bedfordshire, but it is altogether inferior to the Russian.

CU'CUMIS, the cucurbitaceous genus which comprehends the melon, the cucumber, and some sorts of gourd.

C. Melo. The Melon. The native country of this valuable plant is unknown. For the cultivation of this fruit, see MELON. All the melons known in Europe belong to the present species, unless it be the Winter Melon and its varieties.

C. utilissimus, an annual, native of the higher cultivated lands of India, but generally found in a cultivated state.

C. sativus, the Cucumber. Tartary is assigned to this species as its native country, but upon authority equally questionable with that for the melon. No modern traveller seems to have found it wild. [CUCUMBER.]

C. Colocynthis, the Colocynth Gourd. This plant furnishes the drug colocynth, so well known for its purgative properties. It is found wild in the Grecian Archipelago, Egypt, and the north-eastern parts of Africa generally. Burckhardt saw it covering large tracts in Nubia; and Roxburgh speaks of it as common on the coast of Coromandel. This species grows like a cucumber. Its fruit is small, round, deep yellow, smooth, hard externally, with an intensely bitter pulp. The gourds are gathered in autumn, when they are beginning to turn yellow; they are then peeled and dried rapidly in stoves.

C. Citrellus, the Water-Melon, is most extensively cultivated in India and the tropics of Africa and America, and generally in hot countries, but which is of no value in the north of Europe, where high flavour is required more than cooling properties.

The other species are of little moment; many are eatable, but they are in all respects inferior in quality and size. *C. Dudaim* is sometimes grown under the name of Queen Anne's Pocket Melon; but it is a mere curiosity.

CUCUMIS COLOCYNTHIS, or *Bitter-Apple*, an annual plant, the fruit of which is about the size of an orange, but of rather lighter colour, the rind smooth; when the rind has been removed, a white spongy pulp or pith is found within, which constitutes the officinal part, or the Colocynth, the seeds being rejected. The rind is generally removed before reaching Europe.

The active principle is a peculiar bitter principle (Colocynthin), which is of a resinoid nature, more soluble in alcohol than water: its solubility in water is much increased by union with extractive, combined with which it exists in the pulp, so that nearly all the virtues are yielded to a watery extract, which is generally employed for its administration. The compound extract, in the formation of which proof spirit is used, and to which are added other purgative substances and aromatics, is however preferable, and it is thereby rendered milder yet more certain in its action.

It is a purgative in very constant use, either alone, or more commonly united with mercurial purgatives. As an over-dose is poisonous, it must be used with caution.

CUCUMITES, a genus of fossil plants, from Sheppey. (Bowerbank.)

CUCU'RBITA, the genus from which the natural order derives its name. The common Gourd, *C. maxima*, with its endless varieties, the Vegetable Marrow, *C. ovifera*, the Orange Gourd, *C. aurantia*, and *C. Melopepo*, the Squash or Bush Gourd, are the principal types. It is not a little remarkable that the native country of these common plants is entirely unknown.

Generally speaking, the species and varieties of cucurbita are harmless and eatable, constituting a very important part of the diet of the poorer classes in countries which are subject to long summer drought. Hence, in the south of Europe, in India, and Africa, they are invaluable; but the Orange Gourd is bitter, and the Bottle-Gourd, *C. lagenaria*, is a dangerous poison.

CUCURBITA'CEÆ, a natural order of plants, consisting of climbing or trailing species.

The order abounds in useful or remarkable plants, comprehending as it does the melon, gourd, cucumber, colocynth, bryony, and all the many species approaching those types. They are chiefly remarkable for the power of adapting themselves to the different situations where they may be grown. Thus, we hear of their affording large and juicy fruit in the midst of the Indian desert, where water is 300 feet from the surface; and they are equally grown in the dry season on the sandy islands of Indian rivers; but excess of moisture does not appear to be injurious, as the great majority are successfully cultivated in the rainy season; and Mr. Moorcroft describes an extensive cultivation of melons and cucumbers on the beds of weeds which float on the lakes of Cashmere: they are similarly cultivated in Persia and in China.

Two principles especially deserve attention in this order, the one saccharine and nutritious, the other bitter, acrid, and purgative; and the qualities of the products of the species vary according to the preponderance of the one or the other. In the melon, the gourd, and their allies, the first exists almost exclusively, and hence the edible nature of their fruit; but even here its well-known laxative quality sufficiently attests the presence of the bitter principle in some degree. In the colocynth, the bottle-gourd, various species of luffa, bryony, and others, the bitter principle is found in a state of concentration, and hence the active and even dangerous qualities of those plants, from which the cucumber itself is not exempt; only its bitterness is destroyed by the peculiar cultivation of that plant.

CUDDAPAH, a town of Hindustan, capital of the district of Cuddapah, is situated in 14° 30′ N. lat., and 78° 54′ E. long., on both sides of the river Cuddapah, a small stream which rises in the hills to the south-east of the town, and falls into the Pennair about 6 miles to the north. This town was long the capital of an independent Patan state, and so continued for some time after the destruction of the kingdoms of the Deccan. The palace of the former nabobs has been converted into a court of justice and a prison. The celebrated diamond mines of Cuddapah are about 7 miles north-east of the town, on both sides of the Pennair. These mines have, it is said, been worked for several hundred years with various success. The mines are pits of small depth. The diamonds are not scattered through the whole of the mine from the surface to the greatest depth, but occur in beds usually not exceeding one or two feet in thickness. Cuddapah is 153 miles N.W. from Madras, and 220 miles N.N.E. from Seringapatam, travelling distances.

CUDDALORE, a town of Hindustan, in the Carnatic, on the shore of the Bay of Bengal, 11° 44′ N. lat., and 79° 50′ E. long. The town is built on both sides of the river Pennair. The houses on the north side are modern, and many of them handsome. The streets on the south side, called the Old Town, are many of them spacious, and contain several well-built houses. Altogether, Cuddalore is one of the handsomest towns in the south of Hindustan. Cuddalore, with the rest of the province of Arcot, came into possession of the English by treaty, in 1795, and is included in the presidency of Madras.

CUDWORTH, RALPH, was born at Aller, in Somersetshire, in 1617. He began to reside at Emmanuel College, Cambridge, in 1632, and became in course of time, as his father had been, a fellow of the college. He was for some time tutor in the college, and had among his pupils the afterwards celebrated Sir William Temple. In 1644 he was appointed master of Clare Hall, and in the succeeding year was elected to the regius professorship of Hebrew. On receiving this appointment, he devoted himself with zeal to the subject of Jewish antiquities. He took the degree of D:D. in 1651. Owing, it is said, to pecuniary difficulties, he now absented himself for some time from Cambridge, but returned in 1654, having

been chosen master of Christ's College. He now married, and the remainder of his life was spent in this college. In 1662 he was presented by the then Bishop of London to the vicarage of Ashwell, in Hertfordshire; and in 1678 he was installed prebendary of Gloucester. In 1678 appeared his great work, the 'True Intellectual System of the Universe;' or rather (for, though complete in itself, it is but a fragment of a larger work which he designed), the first part of the Intellectual System. This first part is devoted to the refutation of atheism. The whole work was to consist of three parts; but the second and third parts, which were to treat respectively of the nature of moral distinctions and of free will, though written, were never published by him*.

Dr. Cudworth died at Cambridge, in 1688, in the 71st year of his age, and was buried in Christ's College. He left one daughter, who married Sir Francis Masham, and who is known, under the name of Lady Masham, as the friend of Locke.

Dr. Cudworth was one of those Cambridge divines, Latitudinarians, Arminians, and Socinians, as they were called by those who, having nothing definite to bring against them, resorted to ugly names, on whom Bishop Burnet has passed a high eulogium in his history of the reign of Charles II. The chief others at this time were Drs. Whitchcot, Wilkins, Henry More, and Worthington. 'Dr. Whitchcot,' says Burnet, 'set young students much on reading the ancient philosophers, chiefly Plato, Tully, and Plotin, and on considering the Christian religion as a doctrine sent from God, both to elevate and sweeten human nature, in which he was a great example, as well as wise and kind instructor. Cudworth carried this on with a great strength of genius and a vast compass of learning. He was a man of great conduct and prudence; upon which his enemies did very falsely accuse him of craft and dissimulation.' ('Hist. of his own Time,' vol. i. p. 321.)

The 'Intellectual System,' or that (properly the first) part of it which now passes under the name, is a work of great learning, and also of great acuteness. But grave charges have been founded upon this work. 'You know,' says Lord Shaftesbury, 'the common fate of those who dare to appear fair authors. What was that pious and learned man's case who wrote the Intellectual System of the Universe? I confess it was pleasant enough to consider, that though the whole world were no less satisfied with his capacity and learning than with his sincerity in the cause of the Deity, yet was he accused of giving the upper hand to the atheists, for having only stated their reasons and those of their adversaries fairly together.' ('Characteristics,' vol. ii. p. 262.)

'There wanted not country clergymen,' says Warburton, 'to lead the cry and tell the world that, under pretence of defending revelation, he wrote in the very manner that an artful infidel might naturally be supposed to use in writing against it; . . . . that, with incredible industry and reading, he had rummaged all antiquity for atheistical arguments, which he neither knew how nor intended to answer; in a word, that he was an atheist in his heart, and an Arian in his book.' ('Divine Legation of Moses,' vol. iii., ed. 1765, Preface.) The accusation alluded to in these passages is made in a circuitous way by Mr. John Turner, in a 'Discourse of the Messiah.'

The 'Treatise on Eternal and Immutable Morality' corresponds to the second part of the 'Intellectual System.' It is directed against those who 'affirm justice and injustice to be only by law and not by nature;' among which affirmers he places, erroneously in our opinion, Hobbes.

Besides the 'Intellectual System,' Dr. Cudworth published several other works, among which are two sermons. He left several works in manuscript, only one of which has yet been published—the 'Treatise concerning Eternal and Immutable Morality,' which appeared with a preface by Dr. Chandler, bishop of Durham, in 1731. His other manuscripts, after having passed through many dangers, were finally purchased for the British Museum, where they now are.

An abridgment of the 'Intellectual System' was published in 1706 by Mr. Wise, Fellow of Exeter College, Oxford, in two volumes 4to. In 1733 a Latin translation was published by Dr. Mosheim, at Jena, in which the numerous errors in Cudworth's numerous quotations are corrected, and whose style is less complicated than that of the original.

(Kippis's *Biographia Britannica;* Mosheim's and Birch's *Lives.*)

CUENÇA. [Castilla la Nueva.]

CUERS. [Var.]

CUIRASS or CUIRASSE, a piece of defensive armour, made of metal, and serving to cover the body from the neck to the girdle, both before and behind; the front, called the breast-plate, and the hinder part, or back plate, were fastened to each other by straps, buckles, hooks, or some other contrivance. The name is supposed to be derived immediately from *Curatia* or *Curassa*, a Latin word of the Middle Age, and originally from the Latin *corium*, 'a *hide*,' cuirasses having at one time been made of leather.

The Egyptians are said to have been the inventors of such armour, but among that people it consisted of folds of linen. Cuirasses of brass or steel, and occasionally of gold or silver highly ornamented, were used by the Greeks and Romans. After having been long disused, the cuirass was revived in Europe about the middle of the fourteenth century; and in the English service it was again disused after the reign of George II. Since the year 1820, however, it has been revived as part of the accoutrements of the life-guards.

CUIRASSIERS, heavy cavalry armed with cuirasses. Most of the German powers, especially the Emperor of Austria and the King of Prussia, have regiments of cuirassiers. They also form a portion of the French cavalry. In England we have no regiments which go by this denomination, although what are called the life-guards now wear the cuirass.

* A reference to Dr. Cudworth's preface, in which he makes a division of his subject, or to the beginning of his first chapter, shows that the treatise on Eternal and Immutable Morality, which has been published since his death, is the second part, and the treatise on Liberty and Necessity, which is still in MS., is the third part of the work.

CUJA'CIUS, CUJAS, JACQUES, was born at Toulouse in the year 1520. His father, a tanner of Toulouse, was named Cujaus, which the son changed into Cujas, for the purpose of making the name better suited for the Latinised form of Cujacius. In the latter part of his life he often signed De Cujas. Cujas, at an early age, distinguished himself by his talents and assiduity, and is said to have learned Greek and Latin without any teacher. He studied law at Toulouse under Arnold Ferrier, for whom he entertained a high respect all his life; but he acquired the best part of his extensive knowledge by his own industry. With unwearied labour he studied all the works of the best civilians, and exercised himself in discussions with his fellow-students. In 1547 he began to lecture on Justinian's Institutes, and soon acquired such a reputation, that the most distinguished men of the country, as President Dufaur and John de Foix, sent their sons to Toulouse to study under Cujas. In 1554 a professorship of the Roman law being vacant in the university of Toulouse, Cujas was a candidate; but, by the intrigues of his enemies, a man of very moderate talents, Stephen Forcadel, was preferred. Shortly after, being invited to Cahors as professor of law, he removed there with the greater part of his pupils. In the following year Margaret de Valois, at the suggestion of the Chancellor l'Hôpital, invited Cujas, as professor of law, to the university of Bourges. At that time there were two celebrated lawyers in Bourges, Hugh Doneau (Donellus) and Francis Duarin (Duarenus), both of whom became the rivals of Cujas, who, in consequence of their cabals, and chiefly the enmity of Duarin, removed to Paris. From Paris he was invited to Valence, where he accepted a professorship; but, on the death of Duarin in 1559, he returned to Bourges, where he resided till 1566. In the meantime Margaret de Valois had married the Duke of Savoy, who gave Cujas an invitation as professor to the university of Turin, and he went there. But, not liking Italy, he returned to Valence as professor, and lived there till 1575, with some short interruptions, when he left on account of the religious quarrels which disturbed that city. During his residence in Valence the reputation of Cujas rose to its height. Young men from all parts of Europe, and particularly from Germany, not only students of law, but those who were devoted to other sciences, came to Valence to study under Cujas. Among his pupils was Joseph Scaliger, and James Augustus de Thou (Thuanus), the French historian. Henry III. of France made Cujas counsellor in the parliament of Grenoble, and loaded him with honours. In 1575 Cujas returned to Bourges as professor; but, to avoid the religious troubles, he again left Bourges for a year, during which he lectured on the civil law at Paris. Returning to Bourges, he resided there till his death.

The latter years of his life were greatly troubled by the religious disturbances which then distracted France. On the death of Henry III. the party of the Cardinal de Bourbon made great promises to Cujas, if he would write in favour of the cardinal against the claims of Henry IV. Cujas refused the proposals, and, the fanatics of Bourges being excited against him by his enemies, he nearly lost his life in a tumult. On the 4th October, 1590, Cujas died of grief, as it is said, for the wretched situation of his country. Both friends and enemies united in honouring him with a splendid funeral.

Cujas was twice married. He had a son of great talents, who died in 1581, and a daughter by his second marriage, who was notorious for her disorderly life.

Cujas was distinguished both as a teacher and a writer. His merits principally consisted in substituting a more rational system in place of the unscientific method of Bartolus, and in grounding his interpretation of the civil law on a profound study of the original authors, and of the manuscripts of the Roman law. He possessed in his own library 500 MSS. on the Roman law. His knowledge of archæology also and his exact acquaintance with the ancient languages gave him a decided superiority over other civilians. In teaching as well as in his writings he followed the exegetical method, in which he may still be considered as a model.

The works of Cujas are very numerous. They are commonly divided into Opera Priora, which were published in his life by himself: first at Paris, 1577, 5 vols. fol., and again in 1583; and Opera Posthuma, which were edited by his friends after his death. Both the Opera Priora and Posthuma were first collected and edited by Alexander Scot, Lyon, 1614. The most complete edition is that by Fabrot, Paris, 1658, 10 vols. fol. As it is very difficult to find what we want in the works of Cujas, the 'Promptuarium Operum Jacobi Cujaci, auctoro Dom. Albunensi,' Naples, 1763, 2 vols. fol., is a great assistance.

The works of Cujas consist: 1, of editions of the original texts of the civil law, principally of the Codex Theodosianus, Pauli Receptæ Sententiæ, Justinian's Institutes, of the three latter books of the Codex Justinianeus, and the Consuetudines Feudorum with notes, and a translation of the sixtieth book of the Basilica, of which he also published an edition; 2, of commentaries, notes, and interpretations relating to most parts of the Institutes, Pandect, Code, and Novels; a Commentary on the Decretals, and Lectures on many passages of the Pandect; 3, other important works, as his 'Observationum and Emendationum libri xxviii.,' a work which civilians in the time of Cujas called 'opus incomparabile et divinum.' It contains corrections of the original texts of the civil law and of a great number of authors, both Greek and Latin; 4, Paratitla ad Digesta et in libros ix. Codicis, which is a summary of the titles of the Pandect, and the Constitutions of the Code.

CULDEES, the name of a religious order in Scotland, Ireland, and the north of England, whose origin may be dated from the middle of the sixth century. The information regarding their origin is chiefly derived from the memoirs of their founder Columba. The Culdees had establishments in various parts of Scotland, many of them in the form of colleges, where they kept small libraries of MSS., and gave instruction to youth.

Their principal establishments, besides that of Iona, were at Abernethy in Perthshire, the island of St. Serf in Lochleven, Dunkeld, St. Andrews, and Monymusk in Aberdeenshire. Besides the dispute as to the holding of Easter, and the difference of opinion on the marriage of ecclesiastical persons, the Culdees had many subjects of dispute with the Romish hierarchy, from whose customs they seem to have diverged on the subject of auricular confession, and on various others. They were at last obliged to give way before the waxing influence of the Church of Rome. (Jamieson, *Historical Account of the Ancient Culdees of Iona.*)

CULEX. [CULICIDES.]

CULI'CIDES, a family of dipterous insects of the section *Nemocera*. They are armed with a long and slender proboscis, usually straight and projecting. This family is divided into three genera, thus characterised:—

Anopheles. Palpi equal in length to the proboscis, in both sexes.

Culex. Palpi of the males longer than the proboscis, and in the females very short.

Œdes. Palpi shorter than the proboscis, in both sexes. We are but too well acquainted with the tormenting insects of this tribe, known in this country by the name of *Gnats;* in France they are called *Cousins*, and in America *Mosquitoes*. They pierce the skin by means of their proboscis, in order to feed upon the blood, and at the same time inject a poisonous fluid, producing considerable inflammation and swelling, which do not always readily subside. It is said that the females alone are the persecutors. As examples we may mention the Common Gnat (*Culex pipiens*), and the Mosquito (*Culex Mosquito*).

It is generally during the night or towards evening that the Gnats or Mosquitoes (often in countless myriads) emerge from their concealment and commence their life of activity. They abound alike in the regions of the north and in the hotter countries; and dreadful are the attacks of these armies of minute beings, details of which appear in the works of so many travellers, and are in fact sufficiently familiar to all. The females deposit their eggs (which amount to 200 or 300) one by one, agglutinating them together so as to form a sort of raft, which floats on the surface of the water, in which element the larvæ exist and receive air, while floating head downwards, through a caudal or terminal tube. The species are numerous.

CULLEN, WILLIAM, was born in Lanarkshire, in the year 1712. His parents being in humble circumstances, he commenced the study and even the practice of physic under certain disadvantages; and, after serving an apprenticeship to a surgeon-apothecary in Glasgow, he became surgeon to a merchant-vessel trading between London and the West Indies. He soon returned to his own district, and practised in the country parish of Shotts, a region proverbial, even in Scotland, for bleakness and poverty. Here an incident occurred which was perhaps his first gleam of good fortune, or, in other words, the first accident of which his genius availed itself to further his success. The Duke of Argyle, while on a visit to a gentleman in the neighbourhood, was amusing himself with some chemical experiments, for which the apparatus in his possession proved insufficient: his host recollected Cullen as a person likely to supply the deficiency, who was accordingly invited to dinner, introduced to the duke, and acquired his good opinion. He soon removed to Hamilton, where he was admitted a councillor in 1737, and was chief magistrate in 1739 and 1740. Here he formed a partnership with a young man destined to attain equal celebrity, William Hunter. The chief object of this connection was to enable them to improve their medical education; and accordingly they agreed that one of them should alternately be allowed to study during the winter at some medical school, while the other should carry on the business in the country for the profit of both parties. This continued but a short time, for Hunter, who went to London, was engaged by Dr. Douglas as his assistant, and thus his connection with Cullen ceased.

The Duke of Hamilton, having been suddenly taken ill at his palace, sent for Cullen, who not only benefited him by his skill, but pleased him by his conversation. It appears to have been the interest of this nobleman which procured him the situation of lecturer of chemistry in the University of Glasgow; and, having previously taken his doctor's degree, he began his first course in 1746. His medical practice daily increased; and, when a vacancy occurred in 1751, he was appointed by the king to the professorship of medicine.

In 1756 he was called to Edinburgh to fill the chair of chemistry, vacated by the death of Dr. Plummer. Alston, the professor of materia medica, died in 1763, and was succeeded by Cullen, who, though now in the middle of his chemical course, began his new subject a few days after his nomination. So great was his popularity, that, while only eight or ten pupils had entered under Alston, he attracted above a hundred. On the death of Dr. Whytt, in 1766, Cullen took the chair of theoretical medicine, resigning that of chemistry to his pupil Black. As a lecturer, Dr. Cullen was the greatest ornament of Edinburgh in the days of its greatest celebrity; and, like all who have excelled in that difficult branch of the profession, he carried with him not merely the regard but the enthusiasm of his pupils. He lectured from short notes; and this nearly extemporaneous delivery no doubt contributed to that warmth and variety of style which tradition ascribes to his lectures, but which are certainly not the characteristics of his published works. He died Feb. 5, 1790. One of the most important of Dr. Cullen's works, and which has been frequently reprinted, is 'First Lines of the Practice of Physic,' 4 vols. 8vo., Edinb., 1774.

CULLEN. [BANFFSHIRE.]

CULLO'DEN, a house and estate belonging to the family of Forbes, about three miles N.E. from Inverness, which has given name to the battle fought April 16, 1746, which put an end to the Rebellion.

CULM. [MARIENWERDER.]

CULMBACH, a town in the Bavarian circle of the Upper Main, is situated in a fertile country

on the left bank of the White Main, in 50° 5′ N. lat., and 11° 27′ E. long., and has 4000 inhabitants. It is a well-built town, and has 3 churches, a hospital, infirmary, several broweries, potteries, an earthenware manufactory, tanneries, &c. In the neighbourhood stands an old castle, the Plassenburg, at present used as a house of correction.

CULMINATION (*culmen*, the summit). A star culminates, or comes to its highest point, at the moment when it is on the meridian.

CULTIROSTRES, a name given by Cuvier and others to a family of birds of which the cranes, herons, and storks are the representatives.

CULVERIN. [Artillery.]

CUMÆ, an ancient town on the coast of Campania, about ten miles west by north of Naples. It is said to have been built by a colony of Chalcidians from Eubœa, and was one of the earliest Greek colonies on the coast of Italy. According to Livy (viii. 22), the people of Palæópolis, afterwards Neápolis (Naples) were also a colony from Cumæ. During the second Punic War, Cumæ was still independent, and had its own senate, which took part with Rome. Under the Romans, Cumæ lost its importance: the superior attractions of Baiæ, owing to its more sheltered situation and better climate, probably contributed to the decline of Cumæ. The town lay partly on the hill, which is rocky and steep, and partly on the seashore. There are the remains of an amphitheatre in the plain towards the south. The temple of Apollo stood on the Acropolis, on the hill which is now called Rocca di Cuma. The ground is here strewed with prostrate columns, capitals, and fine marble slabs with Greek inscriptions, half covered with aromatic herbs, wild flowers, and vine leaves. From the summit of the rock there is an extensive view, grand but solitary and desolate, extending on one side over the wide expanse of the Mediterranean, and on the other over the lakes of Fusaro, Licoli, and Patria, and the low lands of the coast as far as Gaeta, while to the east the Mons Gaurus separates it from the coast of Pozzuoli and the Bay of Naples. The road from Pozzuoli to Cumæ passes under a fine arch or gateway, inclosed between two rocks, through which the road has been excavated. This arch, probably a work of the Roman period, is now called Arco Felice. (Paoli, *Antichità di Pozzuoli*, &c.)

CUMANA. [Venezuela.]

CUMANIA. [Hungary.]

CUMBERLAND, one of the northern counties of England, lies between 54° 11′ and 55° 12′ N. lat., and 2° 19′ and 3° 36′ W. long. It is bounded N. by the Solway Frith and Scotland; E. by Westmoreland and Lancashire; E. by Northumberland and Durham; and W. by the Irish Channel. The greatest length, from S.S.W. to N.N.E., is 80 miles; the greatest breadth, from E. by N. to W. by S., is 60 miles. The area is 1523 square miles, or 674,720 acres. The population in 1841 was 178,038.

The coast from the mouth of the Esk to Maryport is low and flat; as it extends S.S.W., it becomes more rugged, and on both sides of Whitehaven is high and precipitous; after passing St. Bees' Head, the direction changes to S.S.E., when the coast again becomes low, and so continues to the æstuary of the Duddon.

The south-eastern part of the county is mountainous and rugged, but contains many fertile valleys and several beautiful lakes; the northern and eastern parts of the county are hilly; the north-western part is flat, with sandy tracts and barren moors along the shores of the Solway Frith; farther inland, the country is a fertile lowland extending for many miles round Carlisle in every direction.

The group of mountains occupies rather more than a third of Cumberland, perhaps one-fifth of Westmoreland, and a small part of North Lancashire. The road leading from Kendal to Carlisle through Shap may be considered as its eastern boundary. From this line the mountains extend westwards, and terminate with Dent Hill, near Egremont. The most northern point of the mass is Fell Top, near Hesket-New-Market in Cumberland, and the most southern the slate quarries near Ulverston in Lancashire. From north to south the group measures about 37 miles, from east to west about 35 miles. The whole system probably covers a surface little short of 700 square miles.

This group consists properly of one immense mass of rock, furrowed by narrow and deep valleys, the directions of which are towards all the points of the compass. By these valleys a large number of ridges is formed. That part of the range which extends westwards from the Shap Fells passes through Helvellyn (3055 feet), embraces Red Pike and Pillar (2893 feet), and terminates with Dent Hill (1110 feet). The high cape of St. Bees' Head (222 feet), which lies in the prolongation of this line, is cut off from the range by low ground, which extends between Whitehaven and St. Bees. Several high peaks occur to the north of this line. One extensive mass of rocks, lying to the east of Bassenthwaite Water, is overtopped by the three high summits of Saddleback (2787 feet), Skiddaw (3022 feet), and High Pike near Hesket-New-Market (2101 feet). To the south-west of Bassenthwaite-Water is Grasmere Fell (2756 feet). On the south of the axis, the highest summits are due south of Pillar. In this part are Scaw Fell (3092 feet), and Bow Fell, near Eskdale (2914 feet). East of them, Coniston Fell (2577 feet) is more isolated. Black Comb (1919 feet) is much farther south, near the æstuary of the Duddon.

The greatest part of this cluster of mountains is formed by stratified deposits of slaty texture, of which the northern part consists of green quartzose roofing slate, and the southern portion of grauwacke slate.

This group of mountains is well known for its picturesque scenery. The mountains rise with steep acclivities, inclosing narrow but in some parts well-cultivated valleys, which derive a great part of their beauty from the lakes which occupy the widest parts of them. Of these lakes Ullswater extends about 9 miles between Cumberland and Westmoreland, and forms part of the boundary of the two counties. Derwent-Water (3 miles long) and Bassenthwaite-Water (4 miles long) are formed by the river Derwent in its course from Borrow-

pale to Cockermouth. Buttermere-Water (1½ mile long), Crummock-Water (3 miles long), and Lowes-Water (1 mile long) form a series in another valley, from which flows the river Cocker. Ennerdale-Water (3 miles long), and Wast-Water (3 miles long) are isolated lakes which lie in the valleys of Ennerdale and Wastdale. Thirlmere (2½ miles long) also occupies a separate valley between Helvellyn and the Borrowdale Mountains.

There are some remarkable waterfalls in Cumberland, of which the largest are—Scale-Force, near Buttermere (190 feet), Barrow Cascade (124 feet), two miles from Keswick, and Lowdore Cascade (100 feet), near Keswick.

Of the rivers of Cumberland, the Liddel forms a part of the boundary between Cumberland and Scotland, till it flows into the Esk, which passing by Longtown falls into the head of the Solway Frith. The Eden rises to the south of Kirkby-Stephen, in Westmoreland, and, flowing in a N.W. direction by Appleby, receives the Eamont, which runs from Ullswater, passes to the east of Penrith, then by Kirkoswald, and, having received the Irthing, flows past Carlisle into the head of the Solway Frith. The Derwent rises in Borrowdale, and, having formed Derwent-Water and Bassenthwaite-Water, receives the Cocker at Cockermouth, and falls into the sea at Workington. The other rivers are smaller. The Whampool and Waver fall into the Solway Frith. The Ehen flows from Ennerdale-Water and passes by Egremont to the sea. The Duddon forms the boundary between Cumberland and Lancashire for about 20 miles, and at its entrance into the sea forms a wide æstuary, which at low water is nearly dry, and across which the Whitehaven and Furness Railway is in process of formation. The Ellen passes by Ellenborough, and falls into the sea at Maryport. The Greta, the Caldew, the Peteril, the Croglin, and several other small rivers and streams in the county, as well as the larger rivers and lakes, abound in fish.

The ship canal from Carlisle to the Solway Frith is the only canal in the county. The railways of Cumberland, now (1848) wholly or in part open for traffic, are the Caledonian, the Newcastle and Carlisle, the Maryport and Carlisle, the Maryport and Whitehaven, the Whitehaven and Furness, and the Cockermouth and Workington, making an aggregate length of about 120 miles within the county.

Cumberland is situated in the red marl district, which lines the western base of the great group of mountains. White and red sandstone may be found almost every where west of the mountain group. St. Bees' Head is entirely composed of new red sandstone. At Whitehaven the red marl formation is seen reposing on the coal formation, covered by the marl-beds containing gypsum.

The minerals are—iron, lead, plumbago, copper, silver, coal, and limestone. Iron-ore is found in connection with the coal formation, especially between Whitehaven and Egremont in large quantity and rich in metal; lead, chiefly at Alston; plumbago, the purest hitherto discovered, in Borrowdale; silver and copper, mostly in connection with the lead-mines; coal, chiefly at Whitehaven, and also at Workington, Broughton, Greysouthen, and elsewhere. Limestone is very abundant in many parts of the county.

In consequence of the great extent of coast and the numerous high mountains, the climate is various. The mountains and high grounds are cold and piercing; the lower parts are mild and temperate: the whole county is exposed to wet and variable weather, particularly in the autumn, yet it is healthy, and many instances of longevity occur.

The soil of this county varies much; it often differs in the same parish, and sometimes even in the same field. The mountainous districts are bleak and barren, the most prevalent soil being mossy or dry gravel covered with heath. They are chiefly used as sheep pastures and preserves for moor-game. Some good land of dry brown loam is found in the valleys, and on the sides of some of the smaller mountains. On the margins of the rivers is much valuable ground, consisting of rich brown loam. On the coast the soil is light sandy or gravel. The lowland country, extending from Carlisle in every direction for many miles, is fertile, though a considerable portion of it is cold wet loam and black peat earth: this land has latterly been much improved by draining, which is now carried to a very great extent. There is a good deal of fertile clayey loam in the neighbourhood of Wigton. Sand and light loam prevail near Brampton, and likewise near Penrith. In the west of the county there is some wet soil on a clay bottom, and also some hazel mould. The agriculture of the county has been much improved of late years, and great quantities of corn and produce of various kinds are now exported. The chief exports are from Port Carlisle, Whitehaven, Workington, and Maryport, and consist of cattle, sheep, poultry, grain, potatoes, butter, bacon, &c. The land being divided into small farms, the dairies are necessarily on a small scale, though their produce is excellent, and bears a high price in the market. The Cumberland hams and bacon are especially in great repute. Many of the farms do not exceed 100 acres, and some are not more than 40 or 50 acres. Many persons, provincially called *statesmen*, occupy their own lands, which, in some instances, have passed for several centuries in a regular line of descent in the same families.

Divisions, Towns, &c.—Cumberland is divided into five wards—Allerdale Ward below Derwent, Allerdale Ward above Derwent, Cumberland Ward, Eskdale Ward, and Leith Ward. The number of parishes is 104. The county returns four members to the House of Commons, namely, two for East Cumberland, and two for West Cumberland: in addition to which, the city of Carlisle returns two members, the borough of Cockermouth two, and Whitehaven one. Cumberland is in the northern circuit. The assizes are held twice a year at Carlisle. The quarter-sessions are held twice a year at Carlisle, and twice a year at Cockermouth.

The following are the principal towns, with the population of each in 1841:—

Abbey-Holme, about six miles W. by N. from Wigton, derives its name from an abbey of Cistercians, founded about the year 1150 by Prince

Henry, son of David, king of Scotland; part of the ruins have been converted into the parish church. Population of the township, 868.

Allonby is pleasantly situated on the shore of the Solway Frith, and is frequented as a bathing-place. Population, 811.

Alston is situated in a wild and mountainous district, on the confines of Northumberland, near the Tyne, and has valuable lead-mines in its vicinity. On an average, the mines produce 7600 tons of lead annually, and from every ton about thirteen ounces of silver are extracted. Copper is also worked in several of the mines. Population of the town, 1650.

Bootle is a very small market-town, 4½ miles S. by E. from Ravenglass. It has a very ancient church, an independent chapel, and two endowed schools. Population of the parish, 696.

Brampton is on the road from Newcastle to Carlisle. A new town-hall and a national school were erected by the Earl of Carlisle in 1817. Gas-works have been established. Here are four dissenting chapels. The old church, a part of which only is remaining, is situated a mile and a half from the town, on an eminence near the village of Irthington. Population of the township, 2754.

Carlisle is the capital of the county. [CARLISLE.]

Cockermouth is a parliamentary borough, situated at the junction of the Cocker with the Derwent, 25 miles S.W. from Carlisle. The Cocker divides the town into two parts, and is crossed by an old stone bridge, and the Derwent, after it has received the Cocker, is crossed by a handsome stone bridge erected in 1822. The town is in a rich agricultural district, and has a large corn-market. The ruins of Cockermouth Castle occupy an eminence near the confluence of the two rivers. The town-house, called the Moot-Hall, the workhouse, the church, and places of worship for Dissenters, are the chief public buildings. Population of the township, 4940. Population of the parliamentary borough, which returns two members to the House of Commons, 6420. A branch railway extends from Cockermouth to Workington.

Egremont is a neat little town five miles S.S.E. from Whitehaven, and about three miles from the sea. There is a parish church, a Methodist meeting-house, a national school, and a poor-house. On the west side of the town are the ruins of an old castle, supposed to have been built by the Normans. Population of the parish, 1750.

Harrington is a small seaport between Whitehaven and Workington. The harbour is well constructed for small vessels. Coal is exported to Ireland, and lime to Scotland. There are two yards for ship-building. Population of the parish, 1934.

Hesket-New-Market is a small but neat town, situated on the banks of the Caldew, 9 miles S. from Wigton, and 13 S.W. from Carlisle.

Ireby is a very old town, about 7 miles S. from Wigton. The church is small. Population of the parish, 472.

Keswick is a small and pleasant town, standing on the banks of the Greta, near the lake of Derwent-Water. It is much resorted to by visitors to the lakes, and is celebrated for the beautiful and romantic scenery in its vicinity. The town-hall is a small edifice. Population of the town, 2,442.

Kirkoswald is situated in a beautiful vale on the Eden, 8 miles N.N.E. from Penrith. Population of the township, 691.

Longtown is a modern town on the eastern bank of the Esk, and near the borders of Scotland. The streets are regular and spacious. Population of the township, 1990.

Maryport is a neat modern seaport on the river Ellen. In 1750 there was only one house on the present site of the town. The trade and manufactures connected with ship-building are in a flourishing state. The vessels belonging to the port are chiefly employed in exporting coal and lime, and in importing cattle, timber, flax, and iron. The number of vessels registered Dec. 31, 1847, was 122 (15,416 tons). Population of the township, 5311.

Penrith is an ancient and well-built town, 283 miles from London, situated in a fertile vale near the borders of Westmoreland. It has no manufactories of consequence. The church is a neat and elegant structure. Here are several dissenting chapels, a free grammar-school, charity schools, and a house of correction. Population of the town, 6145.

Ravenglass is a small market-town and seaport, situated at the confluence of the Esk, Mite, and Irt. Population of the town, 337.

Whitehaven is a parliamentary borough and seaport, situated in an inlet on the western coast. In the reign of Queen Elizabeth it was only a small fishing village containing six houses. The streets are regular, generally spacious, and cross each other at right angles. In the vicinity of the town, and also immediately under it, are extensive collieries. Some of the collieries are wrought to the extent of one or two miles under the sea. The main coal-seam is 10 feet thick. From the pits to the quays are railways, at the end of which the contents of the waggons are emptied down large wooden trunks called Hurries into the holds of the vessels. The harbour is commodious, and admits vessels of large size at full tide, but is dry at low water. The number of vessels registered Dec. 31, 1837, was 246 (38,821 tons). There are batteries for the protection of the port, which were repaired after the hostile attack of Paul Jones in 1771. The manufactures are of sail-cloth, linen, check, earthenware, &c. There are also large roperies and yards for ship-building. The chief trade consists in the exportation of coals to Dublin and other parts of Ireland, lime, iron, freestone, gypsum, and grain, and importations of West Indian, American, and Baltic produce. Steam-vessels sail weekly between this port and Liverpool, and occasionally to Dublin, the Isle of Man, and Dumfries. There are three chapels of ease; several meeting-houses for dissenters; national, Sunday, and other schools; union workhouse; infirmary; house of correction; mechanics' institution; custom-house; theatre; workhouse; public office; news-room, and library. Population of the town, 11,834. Whitehaven sends one member to parliament. Population of the parliamentary borough, 15,841. Four miles from Whitehaven

are the clerical institution and the free school of St. Bees (the latter founded by Archbishop Grindall, a native of the parish).

Wigton is a well-built town, situated near the Wisa, on the line of railroad which extends from Carlisle, through Maryport and Workington, to Whitehaven. Checks, ginghams, and calicoes are woven. There is a handsome church, and there are places of worship for Methodists, Independents, Quakers, and Roman Catholics; an endowed grammar-school; a news-room; and a parochial library. Population of the township, 4738.

Workington stands on the south bank of the Derwent, which is navigable for ships of 400 tons' burden, and falls into the sea about a mile distant. Coals constitute the chief export; timber, cattle, bar-iron, and flax are the chief imports. Sail-cloth and cordage are the principal manufactures. Shipbuilding is carried on to some extent. The number of vessels registered Dec. 31, 1847, was 82 (14,002 tons). There are two churches; five chapels for Dissenters; a national, an infant, and Sunday-schools; subscription library; dispensary; assembly-room; theatre; and custom-house. Population of the township, 6045.

History and Antiquities.—The earliest inhabitants of Cumberland of whom we have any account were the Brigantes, who were conquered by the Romans about A.D. 121. The Picts' Wall crossed the county from Newcastle, and terminated at the Solway Frith. [BRITANNIA.] After the retreat of the Romans, the county was laid waste and the city of Carlisle reduced to a state of complete ruin by the Scots and Picts. The county had also to endure the ravages of the Danes. During the Saxon Heptarchy it was joined to the *kingdom of* Northumberland. From 945 till 1237 it was alternately in the hands of the English and Scotch kings, and became much impoverished; and, even after its formal annexation to England, it continued to be a scene of bloodshed and rapine, in consequence of containing the debateable land of the borders. The inhabitants were indeed not relieved from hostile attacks and inroads until the union of the two crowns by the accession of James I. The county suffered much during the wars of Charles I. and of the two Pretenders.

There were formerly several monasteries and ancient hospitals in Cumberland—at Lanercost, Carlisle, Wetheral, Nunnery, St. Bees, Seaton, Holm Cultram, Calder, Penrith, Dacre, and Wigton. Many of the old churches exhibit remains of the Saxon and early Gothic architecture. *Specimens* of the former may be seen in the churches of Aspatria, Torpenhow, and Kirklinton; and of the latter in the abbeys of Lanercost and Holm Cultram.

(Nicholson and Burn's *History and Antiquities of Cumberland*; Hutchinson's *History of Cumberland*; Lysons' *Cumberland.*)

CUMBERLAND, RICHARD, was born in London, on the 13th of July, 1632. He received the early part of his education at St. Paul's School, and went thence to Magdalen College, Cambridge, in 1649. After taking his master's degree he entered into holy orders. In 1658 he was appointed to the rectory of Brampton, in Northamptonshire, where he remained till 1667, when Sir Orlando Bridgman, who had been his contemporary at Cambridge, and was now lord keeper, gave him the living of Allhallows, in Stamford. In both places he performed the duties of minister with exemplary assiduity. His 'Inquiry into the Laws of Nature' appeared in 1672, the year in which Pufendorf published his 'Treatise on the Law of Nature and Nations.' His 'Essay on Jewish Weights and Measures,' a work of great learning and acuteness, was published in 1686.

After the Revolution, Dr. Cumberland was raised to the see of Peterborough, in the room of Dr. Thomas White, who refused the new oath. 'The King (William III.) was told,' says Mr. Payne, his chaplain, to whom we are indebted for a brief memoir of Cumberland, 'that Dr. Cumberland was the fittest man he could nominate to the bishopric of Peterborough. Thus a private country clergyman, without posting to court—a place he had rarely seen—without suing to great men, without taking the least step towards soliciting for it, was pitched upon to fill a great trust, only because he was fittest for it. He walked, after his usual manner on a post-day, to the coffee-house, and read in the newspaper that one Dr. Cumberland, of Stamford, was named to the bishopric of Peterborough, a greater surprise to himself than to any body else.' This was in the *sixtieth* year of his age; but his health was still good, and he entered with great zeal on his new duties. At the age of eighty-three Dr. Cumberland, having been presented by Dr. Wilkins with a copy of his Coptic Testament, then *just published*, commenced, like another Cato, the study of Coptic. 'At this age,' says Mr. Payne, 'he mastered the language, and went through great part of this version, and would often give me excellent hints and remarks as he proceeded in reading of it.' He died on the 9th of October, 1718, in the *eighty-seventh* year of his age.

Dr. Cumberland was a perfect model of virtue. He was also a man of most extensive learning, well acquainted with all branches of philosophy, had a good judgment in physic, which he had studied before he took orders, knew every thing that was curious in anatomy, and was well acquainted with the classics.

The Inquiry into the Laws of Nature was called forth by the political and moral works of Hobbes: it is written in Latin. Hobbes is charged therein with atheism; he is represented, as he is also represented in Cudworth's 'Eternal and Immutable Morality,' as denying any standard of moral good and evil other than one fashioned by human law; he is upbraided for the forms of expression that in a state of nature all men have a right to all things, and that the state of nature is a state of war. All these differences between Hobbes and Cumberland may be traced to a misapprehension of the meaning of Hobbes. As regards Cumberland's own views of moral science, they are substantially correct. Objections may be made to the phrases, 'law of nature' and 'right reason,' by which last he denotes the set of faculties employed in the determination of moral good and evil. Tendency to affect the general good is made the

standard of morality. To endeavour to effect the greatest amount of general good is the one great duty, or the one great 'law of nature;' and we know, according to Cumberland, that it is a duty or law of nature, or law of God, because we know that an individual derives the greatest happiness from the exercise of benevolence, and that God desires the greatest possible happiness of all his creatures. Carrying out the fundamental principle, that the greatest general good is to be sought, he deduces the several particular duties or particular 'laws of nature.' He founds government upon, and tests it by, the same principle.

The 'Inquiry' was printed in a most inaccurate way, and the innumerable errors of the original edition have been perpetuated in the several German and London reprints. Dr. Cumberland left an interleaved copy with a few corrections and additions; in this same copy the whole text was revised by Dr. Bentley; and, thus enriched, the copy was presented to the library of Trinity College, Cambridge, by Richard Cumberland, the great-grandson of the bishop, and grandson of Dr. Bentley. Mr. Maxwell, an Irish clergyman, published a translation in 1727, to which he prefixed and appended some original dissertations. Barbeyrac published a translation into French in 1744, having been allowed the use of the interleaved copy containing the author's and Dr. Bentley's corrections. A third English translation by the Rev. John Towers appeared in 1750.

(Payne's Preface to Cumberland's Sanchoniathon's *History;* Kippis's *Biographia Britannica.*)

CUMBERLAND, RICHARD, a dramatic writer and author, great-grandson of Richard Cumberland, bishop of Peterborough, and grandson by the mother's side of Dr. Richard Bentley, was born February 19, 1732, in the lodge of Trinity College, Cambridge. He was placed successively at the public schools of Bury St. Edmund's and Westminster, and at Trinity College, Cambridge, of which he became a fellow. It was his intention to enter the church, but this was changed by his appointment to the office of private secretary to the Earl of Halifax, who became Lord Lieutenant of Ireland in 1760. Through this connection his father became bishop, first of Clonfert, afterwards of Kilmore. After passing through one or two subordinate offices, Cumberland was appointed secretary to the Board of Trade, soon after Lord George Germaine became first lord in 1775, and held that office until the suppression of the board in 1782. In 1780 he was sent on a confidential and secret mission to the court of Madrid, by which he asserted he lost 4500*l.* which was never repaid to him.

After the suppression of the Board of Trade, he received a compensation allowance, and retired to husband his diminished means at Tunbridge Wells. He now devoted himself altogether to literature, and wrote much, but will hardly be remembered except as an essayist, and as the author of several successful comedies, of which only the 'West Indian,' the 'Wheel of Fortune,' and the 'Jew' need be mentioned. As an essayist he is said to have owed to Bentley the learning of those series of papers in the 'Observer,' on Greek poetry, which contain a rich collection of translated fragments of the comic poets. The merits of the translation however belong to Cumberland. His 'Memoirs,' published in 1806, is a very amusing book, full of interesting anecdotes of the men of his time, which will give the reader a thorough insight into the vain and irritable character of the author.

Mr. Cumberland died, after a few days' illness, May 7, 1811.

CUMBRAY. [Buteshire.]

CUMBRIAN MOUNTAINS. [Cumberland.]

CUMBRIAN ROCKS. Professor Sedgwick has given this term to the lowest series of slaty rocks which appear in the ranges of Skiddaw and Grasmere Fell in Cumberland. They lie below the green slaty rocks of Scawfell, which the same writer regards as coeval with the strata of Snowdon, and ranks under the title of Cambrian Rocks.

CUMI'NUM CY'MINUM, or *Cumin*, is an umbelliferous plant of annual duration, found wild in Egypt and Syria, and cultivated from time immemorial for the sake of its agreeable aromatic fruit, which, like that of Carraway, Dill, Anise, &c., possesses well-marked stimulating and carminative properties. [Cyminum Cyminum.]

CUMNOR. [Berkshire.]

CUNE'GO, DOME'NICO, an Italian engraver of the 18th century, was born at Verona in 1727. He commenced to study as a painter under Francesco Ferrari, but he found engraving more suited to his taste, and, at the age of eighteen, he adopted it as his profession. Cunego settled in Rome in 1761, where his first works were a series of Roman Ruins after Clerisseau, for the Count Girolamo dal Pozzo. In 1773 Gavin Hamilton published his 'Schola Italica,' of which Cunego engraved 22 of the plates. In 1785 he went to Berlin to superintend an engraving institute, but he returned to Rome in 1789, after having engraved many plates at Berlin, some of them of members of the Prussian royal family, after E. F. Cunningham. Cunego engraved also an outline of the great fresco of the Last Judgment, by Michael Angelo, in the Sistine Chapel. He died at Rome in 1794.

CUNEIFORM CHARACTERS are letters of ancient alphabets formed of elements which have been likened to wedges (*cunei*), arrow-heads, and nails, and they approach in form to the wedge or arrow in proportion as the writing is clumsier or more slender. Inscriptions in these characters are found within the limits of the ancient Persian empire in its largest extent, from the Mediterranean to the Persian Gulf, and from Egypt to the Caspian. There are three classes of arrow-headed alphabets; the first is called the Persian, the second the Median, and the third the Babylonian or Assyrian. The first two names are arbitrary, and the third class comprises five varieties, among which there are certainly two distinct languages at least.

The Persian alphabet is the most simple: it is made up of 36 letters, none containing above five wedges, placed side by side, with one exception, in which two are crossed. The second class contains about 100 letters composed of a larger

number of wedges never crossed. The alphabets of the third class are more copious and complex, and some characters in some of the varieties contain a dozen arrows crossed and twisted in every possible way.

Inscriptions of the first class are found at Persepolis, at Hamadan, at Van, and at Bisitun. With one or two exceptions all were engraved by command of Darius Hystaspis or his son Xerxes, at the close of the sixth century B.C. They generally contain an invocation to Ormuzd, followed by a statement that the building upon which they were engraved was erected by that monarch. But the Great Inscription of Bisitun, erected by Darius, is distinguished from all the rest by being a strictly historical document: it details the genealogy of the monarch, the enumeration of the provinces of his empire, his accession to the throne of Persia, and the battles he had to fight with the rebellious chieftains who refused submission to the new sovereign; among whom we find the Pseudo-Smerdis of the Greeks, and a Nebuchadnezzar, the pretended (or perhaps real) son of Nabonidus, the great-grandson of the Nebuchadnezzar of the Bible. The language is closely allied to the Zend and Vedic Sanskrit, and the unmutilated parts of the inscription may now be read with as much certainty at least as the Zend books, and with greater confidence than the Pali or Prakrit of the older monuments of India.

The Median monuments, with a single exception, accompany the Persian, and are translations of them. The language is in form and construction allied to the Tartar class of tongues; it is however very different from any of the modern dialects, and there are no ancient monuments of the class with which to institute a comparison.

Inscriptions of the third class also accompany the Persian monuments, and from this accompaniment the first steps have been made in decyphering the language. But there exist also very many original and more ancient documents in these alphabets at Babylon, Nineveh, and other places on the Euphrates and Tigris, which are probably in the same language; and above forty have been found at Van in Armenia, in another language. Of these monuments we can say merely that advances are making towards their decypherment, that series of kings are found and read with more or less of confidence; but that, so far as is published, we only know that the names read are nearly all unlike those found either in sacred or profane history: two only, Ninus and Nebuchadnezzar, appear to be determined, and the latter name may be an appellative.

CUNEO. [CONI.]

CUNNINGHAM, JOHN, the son of a Scotchman settled at Dublin as a wine-merchant, was born there in 1729. During his short life he followed the precarious career of an itinerant player; and in his later years he was chiefly employed at Edinburgh, and in the north of England, where his personal character was highly respected. He was the author of a farce now quite unknown, and of several small volumes of poetry, chiefly pastoral, whose sweetness has obtained for some of them a corner in popular collections, and entitles their author to a place in the list of minor English poets.

CUNNINGHAM, ALLAN, was born at Blackwood, in Dumfriesshire, in 1784, of parents in very humble circumstances. He was apprenticed to a mason.

In 1810 he came to London, and his name first appeared in print as a contributor in the collection of Cromek's 'Remains of Nithsdale and Galloway Song.' This collection, though purporting to be Nithsdale and Galloway relics, was entirely recast, and much of it written by Allan Cunningham.

For some time after his arrival in London, Allan Cunningham maintained himself by reporting for newspapers, and contributing to periodicals, especially the 'London Magazine,' of which he was one of the principal supports. In 1814 he entered the workshop of Chantrey the sculptor; and the situation which he obtained in his studio, as foreman or principal assistant in working the marble, enabled him to prosecute his literary taste without hazard. The following are his chief works: 'Sir Marmaduke Maxwell,' a drama; 'Paul Jones,' and 'Sir Michael Scot,' novels; 'Songs of Scotland, ancient and modern, with Introduction, and Notes, Historical and Critical, and Characters of the Lyric Poets,' 4 vols. 8vo., 1825; 'The Lives of the most eminent British Painters, Sculptors, and Architects,' in Murray's 'Family Library,' 6 vols. 12mo., 1829–33; the Literary Illustrations to Major's 'Cabinet Gallery of Pictures,' 1833-34; 'The Maid of Elvar,' a poem; 'Lord Roldan,' a romance; 'The Life of Burns;' and 'The Life of Sir David Wilkie,' 3 vols. 8vo., 1843, a posthumous publication. Allan Cunningham died on the 29th of October, 1842, aged 58.

CUNONIA'CEÆ, a small order of polypetalous apocarpous Exogens, allied to *Saxifragaceæ*, with which they were formerly united. They are trees or shrubs, inhabiting Southern Africa, South America, and very sparingly the East Indies. Little is known of their properties, except that their bark is sometimes very astringent, and used for tanning purposes.

CUPAR. [FIFESHIRE.]

CUPELLATION. [ASSAYING.]

CUPID (Cupido, *desire*), in Latin mythology, the god of love. Cicero ('Nat. Deor.,' iii. 23) enumerates three deities, or rather three forms of the same deity, bearing this name, each the son of a different Venus, by a different father. Of these the principal, and the one who is usually meant when the name of Cupid occurs without qualification, is the son of Mercury and of Venus, daughter of Dione. He is represented by the poets as a child armed with bow and arrows. By artists he is variously designed; sometimes riding on a lion, or breaking Jupiter's thunderbolts, to signify that the strongest yield to the influence of love: often with a butterfly, in allusion to his amour with Psyche. [PSYCHE.]

CUPOLA. [DOME.]

CUPPING is of two kinds: one by which some blood is taken away, generally simply termed cupping; the other when no blood is abstracted, which is accordingly termed dry cupping. The

preliminary steps of the operation are the same in both cases. The part to which it is intended to apply the cupping-glasses is washed with warm water, or a warm cloth is merely applied to it, in order to attract blood to the part. A small bell-shaped glass, a portion of the air of which has been expelled by holding it for an instant over the flame of a spirit-lamp, is immediately applied to the spot which has been prepared. The usual amount of pressure on the part being diminished, the blood flows to the part, and produces distension of the vessels and elevation of the surface, as well as a purple or livid colour. If it be intended to take away blood, the cupping-glass is speedily removed, and an instrument called a scarificator, containing a number of lancets, sometimes as many as twenty, is applied, and made to act so as to inflict a corresponding number of incisions on the skin and subjacent vessels.

Where dry cupping only is intended, the glasses may be permitted to remain on the skin for a few moments, and replaced five or six times with a little variation of their position, in order to prevent the skin from being hurt by their pressure.

Cupping by which blood is abstracted is used either where general bleeding is unnecessary, or as supplementary to it, for the removal of congestions or local affections. It is analogous to the use of leeches, over which however, when the situation of the part admits of the application of the glasses, it has many advantages.

Another and most important application of cupping is the prevention by its means of the absorption of poisonous fluids from wounds. For this purpose any thing by which a partial vacuum over the wounded part can be produced will answer, such as a wine-glass, tumbler, or tea-cup with a smooth margin, from which the air has been partially expelled by holding it for a moment over a lighted candle.

CUPRESSINITES, a genus of fossil plants, from Sheppey, containing thirteen species. (Bowerbank.)

CUPRESSOCRINITES, a genus of *Crinoidea*. (Goldfuss.)

CUPRESSUS, a genus of coniferous plants, of which three species are suited to the climate of Great Britain.

C. sempervirens, the common Upright Cypress, is a native of the warmer parts of Europe, but has long since been transferred to gardens for the sake of its deep evergreen branches and leaves, and the gloomy air it imparts to the situations which it occupies. Its timber is of great durability. It is not much cultivated in England, the climate being too damp and cold for it in summer; otherwise it is sufficiently capable of resisting the cold of winter. Its formal mode of growth, moreover, is not to the taste of the people of this country.

C. horizontalis, the Spreading Cypress, is a far handsomer species, partaking in all the excellent qualities of the last, being more hardy, and becoming a beautiful object with its graceful spreading branches, loaded, as they usually are, with large round cones.

C. Lusitanica, the Cedar of Goa, differs from the two preceding in its much freer mode of growth, and in its leaves having a singularly glaucous colour.

CUPULE, a kind of cup or involucre surrounding certain kinds of fruit, and composed of bracts more or less grown together. In the oak the cup of the acorn is the cupule; in the hazel-nut it is the husk; in the beech and chestnut, the prickly shell; and in the hornbeam, the lobed bract.

CUPULIFERÆ. [CORYLACEÆ.]

CURAÇOA. [ANTILLES; WEST INDIES.]

CURACY, CURATE. [BENEFICE; CLERGY.]

CURACY, PERPETUAL. [BENEFICE.]

CURA'TOR, from the Latin *cura*, 'care. Curators in ancient Rome were public officers of various kinds, particularly after the time of Augustus, who established several officers with this title. (Suet., 'Augustus,' cap. 37.) The title is now given occasionally to the keepers of collections in museums.

Curator is also the name of the person, in the Roman system, who was appointed to protect persons in their dealings who were above the age of puberty and under the age of twenty-five years. On attaining the age of puberty, which was fourteen, a youth acquired full legal capacity, and he could act without the intervention of a tutor. But, though he had thus attained full legal capacity, it was considered that he still required protection, and this was given him by a Lex Plætoria, the date of which is uncertain, but it is as old as the time of Plautus, who alludes to it. The effect of this law was to divide all males into two classes, those above twenty-five years of age, and those below, who were sometimes called minores, or minors. The chief object of the law was to protect minors against fraud.

CURCU'LIO, a genus of insects termed *Weevils*, founded by Linnæus for such tetramerous Coleoptera as have club-shaped antennæ inserted on a prolonged rostrum. [WEEVIL.] The Linnæan genus *Curculio* now constitutes an extensive family termed *Curculionidæ*, which includes several thousand species. The restricted genus *Curculio* includes certain beetles of South America.

CU'RCUMA, a genus of plants belonging to the natural order *Zingiberaceæ*. The species are stemless plants with tuberous roots; the flowers are of a dull yellow colour.

C. Zerumbet, Zedoary, is the *Zedoaria longa* of the shops, and has the same property as the following species. It is a native of the East Indies and Java.

C. Zedoaria, Broad-leaved Turmeric, is the *Zedoaria rotunda* of the shops. The tubers of this plant are aromatic, and are used by the Hindoos, not only as a stimulating condiment and a medicine, but as a perfume. Its sensible properties are much like those of ginger, but not so powerful. It is employed in the East in cases of disease, as colic, cramp, torpor, &c., where stimulants are indicated. It is a native of Bengal, China, and various other parts of Asia, and of the Asiatic Islands.

C. rubescens is a native of Bengal. All the parts of the plant have a pleasant aromatic smell when the plant is bruised. The pendulous tubers

of this and several other species of Curcuma yield starch, and are employed by the natives for preparing arrow-root. In Travancore it forms the principal diet of the natives.

C. Amada, Mango Ginger, is a native of Bengal. It is used for the same purpose as ginger.

C. leucorhiza grows in the forests of Bahar. It has remarkably long tubers, often a foot in length, of a pale yellow inside, and they produce an excellent arrow-root.

C. angustifolia, is a native of the forests of India from the banks of the Lona to Nagpoor. Its tubers, which are found at the end of fleshy fibres which meet together forming a crown, yield an excellent arrow-root, which is that met with in the markets of Benares.

C. longa, the common Turmeric, is cultivated all over India. It is occasionally wild, and it is also extensively cultivated in China, Java, Malacca, and in Bengal, prospering in a moist but not swampy soil. The Chinese sort is most esteemed, rather on account of its superior richness in colouring matter than from any other cause. Two varieties are found in commerce, the Round Turmeric (*Curcuma rotunda*) and Long Turmeric (*C. longa*). Turmeric possesses an acrid volatile oil and a colouring matter. It is used on account of the latter principle as a dye. The volatile oil gives it aromatic qualities, which render it useful in languid habits, where digestion is difficult and the circulation slow. It is of some importance as a dye; but it is as a condiment, both in the East and in this country, that it merits notice, as it is an ingredient in all *curry powders* and *curry pastes*.

CURDISTAN. [KURDISTAN.]

CURFEW. [BELL.]

CURIA MURIA or KOORYA MOORYA ISLANDS are situated on the southern coast of Arabia, and afford shelter to Koorya Moorya Bay, which is extensive, and has good soundings throughout. They lie between 55° 20′ and 56° 10′ E. long., and near 17° 30′ N. lat. They are five in number—Hasik, Soda, Hallanny, Karzawet, and Jebeliya. Hallany is the only island of the group that is inhabited. (Captain Owen's *Narrative; London Geographical Journal*, vol. xi.)

CURISCHES HAFF, a fresh-water bay on the coast of East Prussia, which extends from Labiau, in the south, to its opening into the Baltic at Memel. It is 69 miles in length, and 25 miles broad at its widest part. Its confluence with the Baltic is formed by what is called the 'Memel Deeps,' which are from 800 to 1200 feet in width. It is separated from the Baltic by a narrow tongue of land, 70 miles long and about 2 broad, which is composed of the Curische Nehrung, a series of low sand-banks, almost destitute of vegetation. On this neck of land there are a few villages. The bed of the Haff is unequal and variable, and the navigation is therefore very precarious; hence the only vessels used here are large flat boats. The Dange, the Minge, and the Memel discharge their waters into this Haff.

CURLEW. [SCOLOPACIDÆ.]

CURRANT, a well-known hardy fruit, produced by two species of the genus *Ribes*. The one, *R. rubrum*, is remarkable for the mixture of sweet and acid in its fruit, and for the beauty of its semitransparent red or yellow berries. In the fruit of *R. nigrum*, the black currant, a powerful and agreeable aromatic principle takes the place of acidity. The currants of the grocers' shops are the dried berries of a small kind of grape, chiefly cultivated in the Morea and the Ionian Islands, Corfu, Zante, &c.

CURRENCY. [MONEY.]

CURRENTS AT SEA are large masses of water in the ocean or in closed seas, which are in continual motion in a certain direction, and some of which are known to occupy a very great extent of surface. Though their existence was doubtless known to some of the early navigators, it is only in modern times that they have attracted general attention, and that a few facts respecting them have been collected. Under the articles ATLANTIC OCEAN, and BISCAY, BAY OF, the most important of these currents are traced and described; and much valuable information on the subject will be found in Major Rennell's *Investigations of the Currents in the Atlantic Ocean*, Humboldt's *Travels*, and the other authorities quoted at the end of those articles.

CURRIE, JAMES, M.D., was born May 31, 1756, at Kirkpatrick-Fleming, in Dumfriesshire. After having visited Virginia in a mercantile capacity, he returned home in 1776, and commenced the study of medicine at the University of Edinburgh, and, after the usual course, took the degree of M.D., at Glasgow, in 1780. In 1781 Dr. Currie settled and began to practise in Liverpool, and while there contributed papers to the 'Transactions of the Manchester Philosophical and Literary Society,' the 'Memoirs of the London Medical Society,' and wrote a political pamphlet in 1793. In 1797 appeared the work on which his professional reputation principally rests, entitled 'Medical Reports on the Effects of Water, cold and warm, as a remedy in Febrile Diseases.' The name of Dr. Currie however is best known to general readers by his edition of the works of Robert Burns, including both his Poems and Letters, which he published for the benefit of the poet's family, in 4 vols. 8vo., in 1800. This edition has formed the basis of every succeeding collection of the poet's works. In 1804 Dr. Currie felt his health rapidly giving way, and left Liverpool. He visited Bath and Clifton, residing at the first-named place for some time; he then removed to Sidmouth, where he died August 31, 1805.

CURRYING. [LEATHER.]

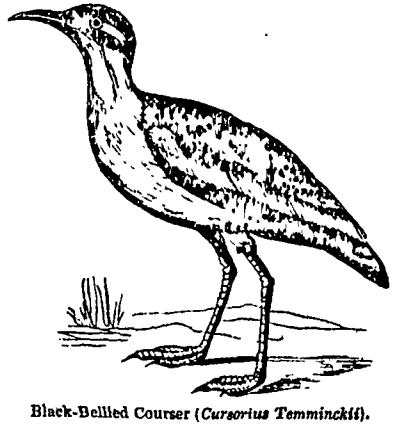
CURSITOR BARON, an officer of the Court of Exchequer, is appointed by patent under the great seal to be one of the Barons of the Exchequer. He attends at Westminster to open the court prior to the commencement of each of the four terms, and on the seal day after each term to close the court. He administers the oaths to all high-sheriffs and under-sheriffs who are sworn by the court, and to several officers of revenue. Prior to 1833 he had various other duties to perform; but since the passing of the Act 3 & 4 Wm. IV. c. 99, much of the business of his office has entirely ceased, and the commissioners appointed

under the 1 Wm. IV. c. 58, in reporting on the consolidation of the offices in the Courts of Queen's Bench and Common Pleas, recommended the abolition of the office of cursitor baron. This recommendation however has not been carried into effect. (*Report of Commissioners on Offices of Courts of Justice*, 1822; *Parl. Paper*, No. 125; *Parl. Paper*, 1835, No. 314.)

CURSORIUS, *Courser*, a genus of birds which evidently belongs to the *Grallatores*.

The genus *Cursorius* is very limited, including only five or six species agreeing closely with each other in habits, manners, and style of plumage.

Generic Character.—Beak as long as the head, slightly arched and pointed; nostrals oval, surrounded by a short protuberance; tarsi long and slender; toes, three before and very short, none behind; wings pointed; claw of middle toe serrated.



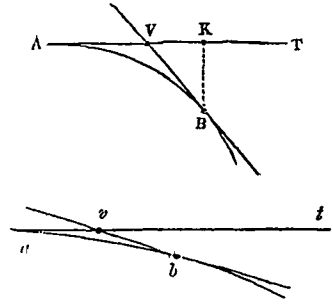
Black-Bellied Courser (*Cursorius Temminckii*).

The species of this genus are all natives of the sultry climates of Asia and Africa, and it is rarely that stray birds are found in the middle districts of Europe, and still more rare is their appearance in the British Islands. They frequent sandy plains, and run with amazing celerity, and their flight is rapid and powerful. Bonaparte places the group in his family *Pressirostres*, of the grallatorial order, between the Bustards and *Œdicnemus*.

Type, the Cream-Coloured Courser, or Cream-Coloured Swift-Foot (*Cursorius Isabellinus*). This species, which is about 8 inches in length, is a native of Africa, and especially Abyssinia. It feeds on insects. About three instances are on record of its having been killed in England (1785, 1816, 1827); one was shot in Wales in 1793. It has been killed in France and Austria.

CURTEIN, or CURTANA, the name given to the first or pointless sword, carried before the kings of England at their coronation; also called the sword of King Edward the Confessor.

CURVATURE, a mathematical term expressive of the comparative degrees of bending which take place near the different points of a curve. If we imagine a point to describe a curve, and to be continually changing the direction of its motion, it may change this direction either more or less rapidly, that is, describe a line which is more or less curved.



Two points, A and *a*, are describing two curves, the directions of motion at A and *a* being AT and *at*. That the first curve is more curved than the second, we may easily see: and, if we wished to give some notion of the comparative degree of curvature, we might proceed as follows. Measure off equal arcs AB and *ab* (remember this equality throughout), say of one inch each; ascertain the direction BV and *bv*, from which A and *a* are proceeding when they arrive at B and *b*, and measure the angles BVT and *bvt*. If we find the first to be twice as great as the second, then the phenomenon by which we recognise curvature (change of direction) is twice as great in the first as in the second. Hence we say that the curvature of the first is twice as great as that of the second.

This gives only a rough idea: the more accurate method is to draw the circles, which must nearly coincide with the curves at the points to be examined, and to consider them as more or less curved according as the circles are smaller or larger.

CURVE. A curve is a line which has *curvature*. Though the second of these terms be derived from the first, yet it is the notion explained in the preceding article which is preliminary to the explanation of the general term *curve*. Let a point move with a perfectly gradual change of direction, and it describes a curve.

Curves are said to be of the same species, in which the motion of the describing point is regulated by the same mathematical law. Thus the general law of the circle is, that all its points are equidistant from a given point. This law is the characteristic of the species; one circle is distinguished from another by the length of the constant distance supposed in the law of formation.

And in like manner as 0, or nothing, is classed under the general name of number or quantity, so the straight line itself (or the line without curvature) is, in algebra, spoken of under the general term *curve*. Or, in the last-mentioned science, the word means any line which is described by a point moving under one and the same law through every part of space which is consistent with the law.

CURZOLA, or Corzola. [DALMATIA; RAGUSA.]

CUSCO-CHINA. This bark, which was first distinguished from the common cinchona barks by Jobst, comes from Cuzco in Peru; but the tree which yields it is altogether unknown. The alkaloid is procured by the same process as is used for cinchonia, which it resembles in its physical qualities, but differs from in its chemical properties. The taste is more bitter, rather heating, and substringent. It is equally insoluble in water, but easily so in alcohol and in sulphuric æther. It forms with acids salts which resemble those of cinchonia, but have a more bitter taste. Its composition renders it worthy in the highest degree of the attention of medical men. The warmth which it excites points out the propriety of giving it in cold intermittents, and low typhoid states of the system.

CUSCUTA'CEÆ, a small natural order of monopetalous Exogens. *Cuscuta*, or Dodder, is a genus met with in most temperate climates, the species fixing themselves on the branches of woody or other plants, twisting round them, striking a number of minute suckers down upon their bark, and thus attracting from the system of the plants and from the air the sustenance necessary to their own support. Hence they are true parasites, although they do not actually, like misseltoe, plunge their roots into the wood and incorporate themselves with the tissue.

Common Dodder, *Cuscuta Europæa*, is a white or reddish-looking annual, which flings its thread-shape arms like a cluster of living threads round the branches of heath, furze, &c., on commons and dry wastes. It has no leaves, except tiny scales that stand in their room; and it bears small clusters of white bell-shaped blossoms. The germination of the Dodder is effected, like that of plants in general, in the earth, and without requiring the presence of other vegetables.

The Dodders are very dangerous to the fields of leguminous plants which they attack, and upon which they multiply themselves with singular rapidity. They destroy the plants either by depriving them of their nourishment, or by strangling them in their folds. It is difficult to guard against them on account of the rapidity of their vegetation, the facility with which they pass from one plant to another, the abundance of their seeds, and the double power which they possess of germinating either in the earth or in the capsule.

CUSP (*cuspis*, a pointed end), a mathematical term used where two branches of the same or different curves appear to end in a point. Thus, in an eclipse of the sun, the borders of the sun and moon make two cusps at their point of intersection.

CUSP, a term now commonly applied to the points terminating the internal curves of the trefoiled, cinquefoiled, &c., heads of pointed arch-windows.

CUSSET. [ALLIER.]

CUSTARD-APPLE. [ANONACEÆ.]

CUSTOM-HOUSE, the building in which the business is conducted of collecting that part of the public revenue which is derived from duties charged upon the importation or exportation of merchandise. In common parlance, the term custom-house has a more extensive signification, and is understood to embrace the establishment by means of which that branch of the public revenue is collected and its regulations are enforced.

CUSTOMARY FREEHOLD. [COPYHOLD.]

CUSTOMS, or USAGES, in England, are either general or local. The first kind consist of those usages which have prevailed throughout England from time immemorial: their origin is unknown; but, having been recognised by judicial decision, they form the chief part of the common law. [COMMON LAW.]

The customs by which the king's superior courts of Westminster Hall regulate their administration of justice are termed their practice. These rules are founded on ancient usage, and, in respect of their universality, form a part of the common law.

Where a custom is already part of the common law, the superior courts take notice of its existence as such, without requiring it to be stated in the written pleadings. Thus each of these tribunals takes notice of its own customs or practice as well as of that of the rest; whereas the practice of inferior courts, as well as local customs, extending to certain persons or districts only, being therefore different from and contrary to the common law, must, with the exception of Gavelkind and Borough English, be set forth with due precision.

This, though an observation apparently technical only, forms in its application the test by which we distinguish general from local or particular customs. Particular customs must have had their origin in the peculiar wants of the districts in which they respectively prevail, for custom arises from a kind of necessity or general consciousness. Many of these customs have remained in some counties, cities, and manors, in all their vigour, though at variance with the laws of the rest of the nation, and are confirmed by Magna Charta and other acts of parliament. Such are the customs of Gavelkind (abolished in Wales by Stat. Henry VIII.), by which all the sons inherit alike, of Borough English, and of some boroughs, that widows shall have dower of all, instead of a third of their husbands' lands. The *existence* of every such local custom, with the exceptions above noticed, as well as its application in each particular case, must be alleged in the pleadings, and proved, like any other fact, before a jury: sometimes they are open to evidence without being pleaded.

A custom, to be valid, must have been used 'from time whereof the memory of man runneth not to the contrary.' In order to be valid, a particular custom must have been continued within time of memory peaceably and without lawful interruption, and will not be lost by mere disuse for ten or twenty years; though in such case it becomes more difficult to establish it by proof. But it cannot stand against an express act of parliament to the contrary. It must also be so far reasonable, that no good legal reason can be given against its continuance. If it may have had a legal and reasonable origin, it shall be presumed that it actually had such an origin; the bare fact of a particular custom varying from the general law forms no objection to it, for that is the very essence

of a particular custom: but, if it be contrary to any known rule or principle of law, or to the good of the public, it will be declared void. Thus no length of usage would render good a custom of the secretary of state's office to issue warrants in general terms against the authors, printers, and publishers of a libel, without naming them; that course is contrary to clear and well-settled principles of law, which will not suffer a mere officer to decide on the individuals who are to be imprisoned. It belongs to the judges of the superior courts to decide what is a valid custom when the question comes before the court.

Where a custom is harmless and affords recreation to a number of persons, though to the temporary inconvenience of an individual, it will be upheld and referred to a legal origin. Thus a custom for the inhabitants of a parish to play at cricket, or dance, on private property in the parish, was held good, as the lord might have annexed this condition to his original grant of the land. A custom must also be certain as to the description of parties benefited, and compulsory, without its depending on the caprice of any third person whether it can be acted on or not. It must also be consistent, and it must be strictly pursued, being derogatory from the common law.

Local custom is alleged in legal forms as existing not in any person certain, but within a certain named district. All customs of cities, towns, and boroughs, by which persons not freemen were prevented from keeping shops or using trades or handicrafts within them, were abolished by 5 & 6 Wm. IV. c. 76, s. 14, except in the case of the customs of the city of London.

Customs of traders, or seamen, as also of agriculture, mining, and other branches of industry, will be followed in the construction of contracts, unless they are inconsistent with their express terms, and, subject to that condition, they are admissible even to annex incidents to them as to which they are silent. The 'custom of the country' means the custom of all parts of the country to which it can in its nature be applied.

The immemoriality of a particular local custom may be sufficiently proved by living witnesses who can attest its continued existence for twenty years, unless contradicted by contrary proof. The numerical amount of instances in which the custom can be proved to have existed must be considerable or not according to the frequency or the rarity with which, according to the nature of the case, they may be expected to recur.

CUSTOMS-DUTIES consist for the most part of taxes levied upon goods and produce brought for consumption from foreign countries; such duties are sometimes collected upon exports made to foreign countries, and upon goods and produce passing from one port to another of the same country. Of this nature were the duties on coals, slate, and stone, carried coastwise from one port in the United Kingdom to another, which duties were repealed in 1831. Since the abolition of the export duty on coal in 1845, the only duties outwards consist of an *ad valorem* duty of one-half per cent. on the shipment of some articles of British production.

The earliest statute passed in this country whereby the crown was authorised to levy customs-duties was the 3rd of Edward I. The mode long employed in the collection of these duties was to affix a certain rate or value upon each kind or article of merchandise, and to grant what was called a *subsidy* upon these rates. The early acts which grant these duties speak of them as subsidies of tonnage and poundage. The word tonnage was applied to a specific duty charged on the importation of each ton of wine and the exportation of each ton of beer; and the word poundage was applied to other articles valued as already explained.

The first "book of rates agreed upon by the House of Commons" is believed to be that compiled by a committee in 1642. The next book of rates of which we have any record was also published by order of the House of Commons in 1660, the year of the restoration of Charles II. In the fifteenth and twenty-second years of the reign of that king, the principle of poundage was altered as respected some articles, and upon those articles specific duties were charged instead, though the system was still followed with regard to the great bulk of articles. But in the reigns of William III. and Anne many additional specific rates were imposed, in place of the valuation for the subsidy. This course of substitution was continued from time to time; so that, in 1747, we find as many as thirty-nine *principal* branches of customs-duties, with subdivisions applying to different kinds of goods, whereby a degree of complication was introduced into the subject which must have caused great embarrassment to traders.

The difficulties here mentioned were increased by the great number of acts of parliament passed from year to year for altering the duties or regulations of this branch of the revenue; and the great bulk and intricacy of the custom-laws had caused such inconvenience, that about the year 1810 the Lords of the Treasury employed Mr. Jickling to prepare a digest of those laws. The work is entitled 'A Digest of the Laws of the Customs, comprising a Summary of the Statutes in force from the earliest period to the 53rd George III. inclusive,' and forms a large octavo volume of 1375 pages. The effect of numerous fresh enactments to impair the usefulness of this exposition of the revenue laws was very soon apparent; and in 1825, Mr. J. D. Hume, the secretary of the Board of Trade, prepared eleven acts, which repealed 443 statutes: eight of these acts were altered or repealed in 1833 by other acts, in one of which 1150 different articles were enumerated. In 1842 Sir Robert Peel effected some improvements in this system, which were carried into effect by 5 & 6 Vict. c. 47. This act reduced the duty on about 750 different articles, on which the receipts had amounted to about 270,000*l*. The number of articles in the tariff was now reduced to 813. Foreign horned cattle, sheep, goats, swine, salmon, soles and other fish, and fresh beef and pork, which had been prohibited formerly, were admitted on paying a duty under the tariff of 1842, and free of duty by that of 1846. In 1844 the duty on foreign wool was abolished. In

1845 Sir Robert Peel effected further improvements in the tariff by abolishing the duty on cotton wool and on 430 other articles. But for statistical purposes the Customs department retains the power of examining articles which do not pay duty.

The net amount of duties collected in the United Kingdom on imported articles, after the deduction of drawbacks, repayments, &c., in the several years from 1828 to 1847, both inclusive, was as follows:—

	£
1828	21,691,613
1829	21,359,802
1830	21,622,683
1831	21,272,263
1832	21,714,524
1833	20,892,902
1834	21,282,080
1835	21,873,814
1836	22,758,369
1837	21,849,109
1838	22,121,038
1839	22,958,254
1840	23,153,958
1841	23,302,152
1842	22,356,324
1843	22,450,074
1844	23,864,494
1845	20,196,856
1846	22,168,735
1847	21,539,775

The management of the revenue of customs is committed to a board of nine commissioners, acting as a subordinate department of the Treasury. The commissioners receive a salary of 1200*l.*: the chairman receives 800*l.* in addition, and the deputy-chairman 500*l.*

CUSTOS BRE'VIUM. Officers so called existed until lately both in the Court of Queen's Bench and the Court of Common Pleas. By the 1 Wm. IV. c. 58, these offices (of which the duties were performed by deputy) were abolished in both courts, and compensation granted to their possessors. The office in the Court of Queen's Bench was held by Lords Kenyon and Ellenborough jointly, and the compensation granted them was 2089*l.* 17*s.* 4*d.* per annum. In the Court of Common Pleas the compensation granted to the custos brevium was 606*l.* 10*s.* 6*d.* per annum. (*Parl. Papers*, 1835, No. 314; 1844, No. 413.)

CUSTOS ROTULO'RUM is the chief civil officer of the county, to whose custody are committed the records or rolls of the sessions. He is always a justice of the peace and quorum in the county for which he is appointed. The lord-lieutenant has the chief military command of the county, and his office is quite distinct from that of custos rotulorum; but it is the invariable practice to appoint the same person to both offices, in whom is united the highest military and civil authority within the county. By Statute 37 Henry VIII. c. 1, and 1 Wm. III. c. 21, he is appointed under the queen's sign manual. As he has the custody of the rolls of the sessions, he should attend there in person or by deputy; and this duty is performed by the clerk of the peace as his deputy. [Clerk of the Peace.] (Blackstone, *Comm.*; Burn, *Justice of the Peace*; Dickinson, *Guide to Quarter-Sessions.*)

CÜSTRIN, or Küstrin. [Brandenburg.]

CUTCH. [Hindustan.]

CUTICLE. [Skin.]

CUTTACK, the capital of the district of Cuttack, in Hindustan, is situated in 20° 25′ N. lat., and 85° 52′ E. long. The town is built on a tongue of land between two branches of the river Mahanuddy. During the rainy season Cuttack would be subject to inundation but for large and solid embankments faced with cut stone, which effectually keep out the water. The river, during the rains, is a mile and a half broad, and from thirty to forty feet deep at this part; but during the dry season it is a narrow stream with a depth of only three feet.

CUTTING, in gardening, is a portion of a plant from which a new individual is propagated when placed in the earth. A stick of willow stuck into the ground will put forth roots, and become a new plant; such an instance is a rude exemplification of the manner of multiplying plants by cuttings.

Every bud which a plant contains is a distinct seat of life, capable, under fitting circumstances, of growing, flowering, fruiting, seeding, independently of all other buds, and able, if separated from the mother plant, to form a new individual. The buds of a vine and of a potato are actually so employed under the name of *eyes*; a cutting is merely a small collection of eyes adhering to a mass of woody matter.

A cutting, when prepared for planting, is cut off close to a bud at the bottom, and down to another at the upper end; it is then placed in earth quite up to its topmost bud, the remainder being buried. The object of this is threefold: firstly, to expose only one bud to the stimulus of light, so that when the cutting begins to grow the leaves may not, from their number, require more food than the woody system can supply; secondly, to keep back the other eyes by the pressure of the earth upon them; and thirdly, to expose as great a surface of the cutting as possible to the influence of the moist earth and darkness, by means of which the production of roots will be facilitated.

In delicate operations, where cuttings are difficult to strike, several additional practices are had recourse to. Sometimes they are covered with a bell glass, in order to keep the air that surrounds them saturated with moisture; sometimes they are shaded, with the same object in view; and sometimes their lower end is made to rest upon the bottom of the garden-pot in which they are to grow, in order to remove their wounded end from too much moisture.

CUTTING and STABBING. [Maim.]

CUTTLE-FISH. [Cephalopoda.]

CUVIE'R, GEORGE, was born August 23, 1769, at Montbéliard. His father was an officer on half-pay in a Swiss regiment belonging to the French service. He married late in life a young and accomplished woman, who took especial care of Cuvier's early education. He was first sent to study at Tübingen; afterwards he entered the Academia

Carolina, then newly established at Stuttgard by Prince Charles of Würtemburg, for the purpose of training up young men for public and diplomatic officers. In this academy he devoted much of his time to the study and delineation of objects of zoology and botany. The limited circumstances of his family obliged him to remove from Stuttgard before he obtained any public employment. At the age of 21 he became tutor to the only son of Count d'Hericy, in Normandy, and the proximity of the sea gave him the opportunity of prosecuting a series of researches on molluscous animals, fishes, &c. Here he formed an acquaintance with the venerable Abbé Teissier, author of the articles on agriculture in the 'Encyclopédie Méthodique,' who at that time (the reign of terror) had taken refuge, under the garb and profession of a surgeon, at Valmont.

Through Teissier he became known most favourably to Jussieu and others in Paris, and at their request forwarded some of his papers to the Society of Natural History. In 1795 he went to Paris, being then 26 years of age, and was immediately appointed assistant to Mertrud in the superintendence of the Jardin des Plantes. He commenced that now splendid collection of comparative anatomy, and in December of the same year he opened his first course on that branch of science. In 1796 the National Institute was formed, and Cuvier was one of its first members. In 1798 he published his 'Tableau élémentaire de l'Histoire Naturelle des Animaux,' and afterwards his 'Mémoire sur les Ossemens Fossiles des Quadrupèdes,' and 'Mémoire sur les Ossemens Fossiles qui se trouvent dans les Gypses de Montmartre,' which he added to by subsequent publications. In 1800 he was named Professor of Natural Philosophy at the Collège de France, but still continued his lectures and his labours. In this year appeared the two first volumes of his 'Leçons d'Anatomie Comparée,' of which the three succeeding volumes appeared in 1805. In 1802 the first consul appointed Cuvier one of the six inspectors-general for establishing Lycea, or public colleges, which were supported by government in thirty towns of France. Cuvier established those of Marseille, Nice, and Bordeaux. He was also appointed perpetual secretary to the Institute for the department of Natural Sciences, with a salary of 6000 francs. In 1803 he married the widow of Duvaucel, a former fermier-général: four children, whom he had by this marriage, all died before him. In 1808 he was commissioned by Napoleon to write a report on the progress of the natural sciences from the year 1789. The luminous and interesting treatise which he produced on this occasion was formally presented to Napoleon in the council of state. Cuvier declares the true object of science to be 'to lead the mind of man towards its noble destination—a knowledge of truth—to spread sound and wholesome ideas among the lowest classes of the people, to draw human beings from the empire of prejudices and passions, to make reason the arbitrator and supreme guide of public opinion.'

His next appointment was that of Counsellor for life of the new Imperial University, in which capacity he had frequent intercourse with Napoleon. In 1809-10 he was charged with the organisation of the new academies, the name designed to be given to the old universities of the Italian states which were annexed to the empire. In 1811 he was sent on a similar mission to Holland and the Hanseatic towns. In 1813 Cuvier was sent to Rome, then annexed to the French empire, to organise the universities there. Soon after Napoleon appointed him Maître des Requêtes to the council of state; and in 1814, just before his abdication, he named him Councillor of State,—an appointment which was confirmed by Louis XVIII., who soon after appointed him Chancellor of the University, an office which he held till his death. In 1817 he published a second edition of the 'Recherches sur les Ossemens Fossiles,' in 5 vols, 8vo, and also his 'Règne Animal,' in 4 vols., in which the zoological kingdom is arranged according to the principles of organisation. In 1818 he visited England, and in the same year was elected a member of the French Academy. In 1819 he was appointed president of the Committee of the Interior, in the council of state, and was created a baron by Louis XVIII. He was appointed also temporary Grand Master of the University,—an office which he resigned for that of Grand Master of the Faculties of Protestant Theology in 1822. He himself stipulated that he should receive no salary for this latter office. He was made at the same time one of the vice-presidents of the Bible Society, and through his care fifty new Protestant cures were created in France. He also established new professorships of history, living languages, and natural history, in the minor schools of the kingdom. In 1825 he republished separately the preliminary discourse to the 'Recherches sur les Ossemens Fossiles,' which is generally known under the title of 'Discours sur les Révolutions de la Surface du Globe,' and has been translated into most European languages, under the title of 'Theory of the Earth.' In 1826 Charles X. bestowed on Cuvier the decoration of Grand Officer of the Legion of Honour; and the King of Würtemburg, his former sovereign, made him Commander of his Order of the Crown. In 1827 Cuvier, as member of the Cabinet of the Interior, was intrusted with the superintendence of all affairs concerning the different religions professed in France, except the Catholic. In the same year he lost his only remaining child, an amiable and accomplished daughter, on the eve of her marriage,—a loss from which he never entirely recovered, although a sense of his duties made him stifle his grief. In 1828 appeared the first volume of his 'Histoire Naturelle des Poissons,' of which he lived to see eight volumes completed, and which was continued after his death. In 1830 Cuvier opened a course in the Collège de France, on the history and progress of science, especially natural science, in all ages. In this year he paid a second visit to England, and it was during his absence from France that the Revolution of July took place. On his return he was graciously received by Louis Philippe, who, in 1832, made him a peer of

France. On the 8th of May in that year, he opened the third and concluding part of his course of lectures on the history of science, by summing up all that he had previously said. This discourse, delivered in a calm and solemn manner, produced a deep impression on his hearers, especially when he pointed out what labours remained for him to accomplish, should, as he emphatically said, time, health, and strength be given to him to continue and finish them. It was not so ordained: he had delivered his last lecture. On the following day he felt ill, and soon after paralysis manifested itself. He saw the approach of death with resignation, and expired May 13, 1832, at the age of sixty-three. He was buried in the cemetery of Père-la-Chaise, and his funeral was attended by deputations from the council of state, and several academies, by members of the two chambers, &c., &c.

Thus terminated the career of this great and good man, a few of whose most important works only we have just glanced at: they are in fact so numerous, that even a mere catalogue of them would exceed our limits. The reader will find a full list of them, in chronological order, in the 'Memoir of Baron Cuvier,' by Mrs. R. Lee, to which work, as well as to a well-written article on the 'Life and Labours of Cuvier,' in No. xxviii. of the 'Foreign Quarterly Review,' December 1834, we direct attention. Numerous éloges of Cuvier have appeared in France, by MM. Duvernoy, Pariset, Laurillard, and others.

Cuvier himself wrote numerous éloges; among others, of Brugnières, Daubenton, Lemonnier, Priestley, Adanson, Saussure, Bonnet, Fourcroy, Pallas, Rumford, Werner, Sir Joseph Banks, Delambre, Berthollet, Lacépède, Fabbroni, Ramond, Sir Humphry Davy, &c. He also contributed articles of great value to the 'Dictionnaire des Sciences Médicales,' the 'Biographie Universelle,' and the 'Dictionnaire des Sciences Naturelles.' A little work not generally known, in small 12mo., which was written by Cuvier, deserves mention: it consists of a discourse on the distribution of the annual prize established by the philanthropist M. de Montyon, under the name of *Prix de Vertu*, to be given to those who have excelled by their active virtues in benefiting their fellow-creatures. Louise Scheppler, villager of the Vosges, and disciple of the venerable Oberlin, was one of those who received the prize.

CUXHAVEN, a seaport on the left bank and at the mouth of the Elbe, is situated in 53° 53′ N. lat., 8° 44′ E. long. The town is built on a small piece of ground which belongs to the city of Hamburg, and adjoins the Hanoverian duchy of Bremen. The harbour affords secure shelter to vessels, and when the Elbe is frozen in winter it is resorted to by the steam-packets from England and Holland. It contains about 800 inhabitants, chiefly pilots and fishermen; has a lighthouse, excellent bathing establishments, and arrangements for the performance of quarantine. The chief magistracy is vested in a senator of Hamburg.

CUYP. [KUYP.]

CUZCO, a town in South America, in the Republic of Peru, 260 miles from the Pacific, stands in 13° 42′ S. lat., 71° 4′ W. long., and has a population of 47,000. Before the arrival of the Spaniards it was the capital of the empire of the Incas. In the year 1534, when it was taken by Pizarro, it contained many magnificent buildings, among which was a temple dedicated to the sun, on the site of which now stands the magnificent convent of San Domingo. The town is built in the middle of a wide valley, which has an undulating surface. The houses are built of stone, covered with red tiles. The great size of the stones used in their construction, the variety of their shapes, and the excellent workmanship which they display give to the city an interesting air of antiquity. The cathedral, the convents of Sant' Augustin and of La Merced are very large buildings, inferior in architecture to few in the old world. Upon a lofty hill, a little north of the city, are the ruins of a great fortress, erected by the Incas for the protection of their capital. These ruins present perhaps the finest specimens of Cyclopean architecture in the world. The inhabitants are distinguished by their industry: they manufacture cotton and woollen goods, and leather. Their embroideries and carved furniture are much valued. The town contains a university, 3 colleges, and several schools. The great high road of the Incas extended from this town northward as far as Quito. A very interesting account of the city of Cuzco at the time of its capture by Pizarro is given by Garcilaso in his 'History of the Incas.' (Ulloa; *Memoirs of General Miller.*)

CYANIC ACID, a compound of cyanogen and oxygen. It is a sour fluid, the smell of which resembles that of vinegar; it decomposes with great facility. It is composed of 1 equiv. of cyanogen, and 1 of oxygen. It is isomeric with fulminic acid. [ISOMERISM.]

CYANOGEN, or bicarburet of nitrogen, is a gaseous compound, discovered by Gay Lussac in 1815. It is colourless, and has a peculiar and pungent odour. It is inflammable, and burns with a purple flame; but a taper immersed in it is extinguished. It is not readily decomposed by heat. It is an essential ingredient of Prussian Blue.

CYANOGEN, CHLORIDE OF, *Chlorocyanic Acid*, is in the form of colourless strongly odorous crystals, which dissolve in alcohol and æther without decomposition; but water decomposes them. It consists of Cl^2, Cy^2. Another chloride, Cl^1, Cy^1, is a colourless pungent gas which liquefies at 11° Fahr., and solidifies at a lower temperature.

CYANOMETER, from the Greek works κυανός (blue) and μέτρον (a measure), is an instrument which was invented by M. de Saussure for the purpose of enabling an observer to ascertain the intensity of colour in the sky.

It is well known that the visible heavens, when free from clouds, appear to have a blue tint which gradually increases in intensity from the horizon towards the zenith, and that on the tops of mountains the colour is sometimes so deep as to be almost black. These appearances depend partly on the different extents of atmosphere which the rays of light have to pass through, partly on the quantity of water which the air holds in solution, and in some measure on the terrestrial particles

occasionally raised in the atmosphere: the colour of the sky is also affected by the reflections of light from terrestrial objects, particularly from naked rocks and from masses of snow or ice. It is therefore of importance to ascertain with some precision the intensity of that colour.

The Cyanometer, as formed by the inventor, consists of a circular plate or ring, of metal or pasteboard, on the surface of which, about the circumference, is a band divided by radii into fifty-three equal compartments. One of these is white, and those which follow in succession are coloured with blue of different degrees of intensity from the most faint to the deepest which can be produced; the rest of the compartments are coloured with mixtures of Prussian Blue and Ivory Black, and gradually increase in darkness to the last division, which is quite black. The colours laid on are such, that at equal distances from the eye the tint in each compartment cannot be distinguished from that of the next inferior to it, when the latter is near the eye. The white space being zero, the others are marked, in succession from thence, with the numbers 1, 2, 3, &c.

In using the instrument, the observer, who should be in the open air, holds it up between himself and that part of the sky at which he intends to ascertain the colour, when the compartment which, to the eye, appears to be exactly equal to it in tint expresses by its number the required intensity of the blue colour in that part of the sky.

CYANURIC ACID. This acid forms rather small colourless prismatic crystals, which are efflorescent. It is slightly soluble in water; it is inodorous, has but little taste, and reddens litmus but feebly. It consists of cyanogen 3, oxygen 3, water 7.

CYA'THEA, a genus of plants belonging to the natural order of Ferns. The species are arborescent, and the trunks are often beautifully marked with the scars of the fallen fronds. The species of this extensive genus of Ferns are found most highly developed in tropical climates. They give a peculiar feature to the vegetation of many districts of South America, and specimens have been brought from the forests of Brazil, the mountains of Mexico and Peru, from the islands of the Eastern, Western, and Southern Oceans, and from the south of Africa, and the interior of India and China. Sir William Hooker enumerates about forty different species. They are difficult to determine when brought to this country.

C. arborea, Common Tree Fern, is a native of Jamaica, Hispaniola, Martinique, St. Vincent, probably the West India Islands generally, and Brazil. Twenty-one species are natives of the West Indies, Mexico, and South America. Two only are found in South Africa. Eleven are natives of Eastern India and Islands, the Pacific Islands, and New Zealand.

Few of these ferns are used by man, and, although very elegant, are seldom cultivated. One of these, *C. medullaris*, a native of New Zealand, produces a starchy matter which is used by the natives as food. The starch is found in the roots, and these are baked and eaten as food.

CYATHOCRINI'TES, a genus of fossil *Crinoidea*, confined to the palæozoic strata.

CYATHOPHY'LLUM, a genus of *Madrephylliæa*, which occurs fossil in palæozoic strata, especially in the calcareous beds of the Silurian and carboniferous rocks.

CY'BIUM, a genus of fossil fishes, from the London clay of Sheppey. (Agassiz.)

CYCADA'CEÆ, one of the natural orders of gymnospermous plants. In the manner in which their leaves unroll, and in their terminal single bud, Cycadaceæ resemble Ferns, with which they may moreover be compared on account of their fruit proceeding from leaves; with Coniferæ they accord in the cone-like arrangement of their parts of fructification and their naked ovules; and with Palms in the secretion of a large quantity of fæcula in their stem, in their mode of growth, and in the arrangement of a part of their woody system. Cycadaceæ therefore, belonging as they do to Gymnosperms, possess nearly equal affinity with Palms, or Endogens, and Tree-Ferns, or Acrogens.

A few plants inhabiting India, New Holland, the Cape of Good Hope, and tropical America, constitute the whole of this order, all the species of which contain a large quantity of fæcula in their trunks. *Cycas circinalis* yields a coarse sort of sago in the East Indies, and arrow-root of the finest quality is manufactured from *Zamia furfuracea* in the West Indies.

CYCADEOÏDEA. The fossil stems, proved by Dr. R. Browne to be of the cycadeous family, which occur in the Isle of Portland, were thus named by Dr. Buckland. Brongniart called them *Mantellia*, and they are ranked by Presl as *Zamites*.

CYCADI'TES. Fossil remains of plants allied to the natural group of the *Cycadeæ* are thus named by various authors, but the species are now usually ranked under *Pterophyllum*, *Zamites*, *Otopteris*, &c.

CYCLADES. [ARCHIPELAGO, GRECIAN.]

CYCLA'MEN, a genus of plants belonging to the natural order *Primulaceæ*. The species are herbaceous humble plants with very handsome flowers.

C. hederifolium has been found in Great Britain; at Sandhurst, and near Cranbrook, in Kent. It is rare, and difficult of cultivation. Its flowers exhale a pleasant fragrance. *C. Europæum*, common Cyclamen, is found in the South of Europe. It has been recorded as a native of Great Britain, but, if found, has probably been an escape from gardens. It is often confounded with the former species. This plant is abundant in Sicily, where the wild boars prefer it to any other kind of food. Hence it is called Sow-Bread. It has been used medicinally; it acts upon the system as a cathartic, and was formerly esteemed an emmenagogue. The acrid principle of the root has been separated under the name of *arthanatine*.

One of the peculiarities of the genus is, that the flowers are seated on twisted pedicles, which, when the flowers fade, turn round and round till they bury the capsule which they bear in the earth. In this position the seeds ripen and germinate, and produce other plants.

CYCLANTHA'CEÆ, a highly curious but little known natural order of plants, allied to Pandanaceæ, from which their habit and fructification distinctly divide them. The whole order consists of a very small number of tropical American plants.

CYCLA'RTHRUS, a genus of fossil fishes from the lias of Lyme Regis. (Agassiz.)

CYCLE. This term, which means nothing but circle (κύκλος), has an arbitrary use in chronology. Certain of the cycles, or recurring methods of denoting time, which are in common use, are called cycles, to the exclusion of the rest.

CY'CLICA, a family of tetramerous coleopterous insects, established by Latreille. It is composed of three tribes, of which the genera *Cassida*, *Chrysomela*, and *Galleruca* are the types. The larvæ of the insects of this family are remarkable for their habits. Some cover themselves up in their excrements; others, as the *Cryptocephali*, form tubes of fragments of wood, which they drag about with them; and others bury themselves in the interior of leaves, and live on the parenchyma. The larvæ of the *Chrysomelidæ* are naked.

CYCLOBRANCHIATA, M. de Blainville's third order of the second section of his sub-class *Paracephalophora monoica*. This order includes a section of the *Nudibranchiata* of Cuvier, and consequently is not equivalent to Cuvier's order *Cyclobranchiata*, which contains the Limpets, Chitons, &c. [CERVICOBRANCHIATA.] (See 'Règne Animal,' vol. iii. p. 50, note 3, and p. 113.)

The family characters are thus detailed by De Blainville:—Organs of respiration branchial, in the form of foliated branches, placed together symmetrically near the vent, which is situated in the mesial line of the posterior part of the body; skin naked, and more or less tuberculous. These curious Sea-Slugs are divided into several genera, as *Doris*, *Polycera*, *Onchidoris*, *Peronia*, &c. The species are numerous, and spread abroad over all seas, where they live upon rocks. They are frequently seen swimming reversed, the foot appearing at the top of the water, concave like a boat, while the mantle and tentacles serve as oars. The student should refer to Cuvier's Monograph in the *Annales du Muséum*, vol. iv.; and to De Blainville's, in the *Dictionnaire des Sciences Naturelles*.

CYCLOGRAPH, or ARCOGRAPH, an instrument for drawing arcs of circles without centres, used in architectural and engineering drawing, when the centres are too distant to be conveniently accessible. Bricklayers and masons, when they wish to strike an arc upon the face of a wall, have recourse to a very simple but perfect mode of accomplishing the object, by driving a nail into the wall at each extremity of the intended arc, and then nailing two straight laths or rods together at such an angle, that while their external sides or edges are in contact with the nails driven in the wall, their apex or meeting point shall touch the crown of the required arc or arch. When secured to each other at the required angle, the laths are so moved that, while they remain in contact with the nails, the apex may traverse the whole distance from one nail to another, in doing which it will describe the required curve, which may be marked on the wall by a piece of chalk carried round with it. The same plan may be adopted in drawing on paper, substituting pins for the nails, and a piece of stout cardboard, cut to the required angle, for the laths. Mr. Rotch's *Arcograph*, and Mr. Alderson's *Curvilinead*, both of which are described in the 'Transactions' of the Society of Arts, the former in the thirty-ninth, and the latter in the forty-fourth volume, are instruments employed similarly to the laths above described. An instrument called a *Curvograph*, which was contrived by Mr. Warcup for tracing and copying curved lines, is described in the thirty-fifth volume of the same work.

The *Centrolinead* of Mr. Peter Nicholson, described in the thirty-second and thirty-third volumes of the 'Transactions' of the above Society, pp. 67–70 and 69–81, is an instrument acting on the same principle, although its chief use is, not as a cyclograph, but as an instrument for drawing lines converging to a distant and inaccessible point. It may be compared to a T-rule, in which the transom consists of two pieces adjustable to any required angle with each other, and the centre of which, answering to the apex of the cyclographs above described, is precisely on a line with the fiducial or drawing edge of the stem or long limb of the rule. The instrument being once adjusted to the required angles, and having its angular transom laid against two fixed pins, just like the angle of a cyclograph, any number of converging lines may be drawn by it as readily as parallel lines are drawn by a common T-rule.

CYCLOID (κυκλοειδής, like a circle), a name very incorrectly given to the curve which is traced out by any point of a circle rolling on a straight line. Thus, while the wheel of a carriage revolves, each nail on the circumference describes a succession of cycloids.

CYCLOID FISHES. One great division of fishes is thus termed by Agassiz, from the concentric striation apparent in their scales, of which the substance is horny, not bony nor enamelled. They are rare as fossils in all except the more recent strata, but abound in the actual creation.

CYCLOPÆDIA. [DICTIONARY.]

CYCLO'POMA, a genus of fossil fishes from Sheppey. (Agassiz.)

CYCLO'PTERIS, a genus of fossil ferns (Brongniart), remarkable for the size and orbicular or oval shape of the leafits. To the species from the coal-measures (*C. orbicularis*, *C. obliqua*, &c.) this remark applies better than to those (*C. Beanii*, *dilatata*, &c.) from the oolites, which are really of a different genus.

CYDER. [CIDER.]

CYDNUS. [ANATOLIA; CILICIA.]

CYDO'NIA VULGA'RIS, or *Quince*, of the fruit of which there are two varieties, Apple-Quince and Pear-Quince. The seeds are the part used in medicine, on account of the mucilage which they yield. The seeds are more numerous in the small hard fruits than in the large fleshy fruits. They generally occur in irregularly shaped masses, as they easily adhere to each other, owing to the mucus

which invests them. When moistened in the mouth or in water, they give out a large quantity of mucilage, which is white, and not coagulable by boracic acid. Many seeds yield a yellow-coloured mucilage. If allowed to remain in a fluid state, the solution soon spoils; but by careful evaporation the mucilage may be brought to a dry state, or, as proposed by Zier, the mucilage may be precipitated from its watery solution by alcohol. In whatever way obtained, the mucilage possesses demulcent qualities, and may be employed either internally, or as a lotion, which is especially applicable to the faces of those who suffer from the cold winds of winter and spring.

CYGNUS (the Swan), one of the old constellations of Aratus, who refers it to the fable of Leda, as does Hyginus; but the latter gives another fable of the same kind. The bright star (Deneb), α Cygni, may be seen on the meridian at eight o'clock in the beginning of October; the bright stars in Aquila, Lyra, and Cygnus form a remarkable triangle.

CYLINDER (κύλινδρος), a name given generally to the surface formed by a straight line which moves parallel to itself, whatever may be the guiding curve; but frequently confined to the common definition, which supposes the straight line to be of finite length, and to move round the circumference of a circle, keeping always at right angles to its plane.

The content of a cylinder (in cubic units) is the number of square units in the base multiplied by the number of linear units in the altitude.

CYLINDRICAL LENSES are made by grinding each of the opposite surfaces of a plate of glass in the form of the segment obtained on cutting a cylinder by a plane parallel to its axis. Two segments thus obtained being placed with their plane surfaces in contact, and so disposed that straight lines parallel to the axis of the cylinder drawn on the convex surface of one may be at right angles to lines similarly drawn on the other, would constitute a lens of the kind here indicated.

Lenses of this kind were devised and executed soon after the commencement of the present century by an optician of Paris, who introduced them as eye-glasses in *spectacles* in place of the usual spherical lenses. This person afterwards, conceiving that in such lenses the chromatic aberration was destroyed, attempted to employ them as simple object-glasses for telescopes. But the chromatic aberration is as great in the cylindrical as in the spherical lens; while the aberration arising from the form of the surface, which in spectacles is not always more apparent than the spherical aberration in a common lens, produced, when the image of an object was viewed through the eye-glasses of a telescope, distortions exceeding those of a spherical lens of equal focal length.

CYMBALS, metallic musical instruments of percussion, which are traceable to the remotest ages of antiquity, and, with no great change in form, are still used by the moderns. They are always in pairs, are made of brass, and are nearly flat, about twelve inches in diameter, the central part sunk in; and at the back of the sunken portion is a strap, by which each instrument is held.

CYME, an irregular kind of panicle, having a corymbose appearance, and in which each branch is stopped in its growth after producing a single flower, when it is forced to form lateral branches, which are themselves stopped after forming one flower. The common *Laurustinus* or the Elder-Tree offer examples of this sort of inflorescence.

CYMI'NUM CYMI'NUM. This annual umbelliferous plant is native in Egypt, Æthiopia, &c., and was cultivated by the ancients in Palestine as it is by the moderns in Malta and India. The fruit (improperly termed seed) is the officinal part. Externally it is of a grayish yellow colour, and is larger than those of carraway or anise. The odour is strongly aromatic and rather unpleasant; the taste is warm, bitter, and disagreeable. The odour and taste are mainly due to a volatile oil which is more abundant in this fruit than in most unbelliferous plants: one pound yields half an ounce of this oil, according to some; while ten pounds yield only three ounces and a half, according to others. Notwithstanding this large quantity of oil, the fruits are frequently eaten by insects.

The disagreeable odour of Cumin seems to have gradually discarded it from medicine for man, and restricted its use to veterinary medicine. Its employment in this way may be a relic of its ancient repute, for the Israelites esteemed it highly as a remedy for cattle after the bites of insects. Still it is a potent carminative, and was esteemed by Cullen the best of this class of remedies, a preference to which the very large portion of essential oil it contains justly entitles it. It was considered also as discutient, and employed as a plaster. In the north of Europe it is still much used as an addition to bread and ragouts. It enters into the composition of many curry-powders, but should be introduced into these in very small quantity.

CYNANCHUM, a genus of plants belonging to the natural order *Asclepiadeæ*. The species are herbs or under-shrubs, with opposite leaves and mostly twining stems. *C. vincetoxicum* is a native of sandy places in most parts of Europe, with the exception of Great Britain. It possesses emetic and purgative properties, and was once celebrated as an antidote for poisons, from which it has derived its specific name. *C. Monspeliacum*, Montpelier Cynanchum, is a native of the sea-coast of Italy, of Spain, the south of France, and Greece. The juice of this plant is a drastic cathartic, and when dried it is used as a medicine under the name of Montpelier Scammony. *C. ovalifolium* is a native of Penang, where, according to Dr. Wallich, it is used for the purpose of procuring caoutchouc from its sap. *C. Argel* is a native of Upper Egypt. The whole plant acts as a powerful drastic purgative. This plant appears to be a native of the same districts as those from which the Alexandrian Senna is obtained, and all the samples of that senna contain leaves of this plant. They do not however appear to be added for the purposes of adulteration, but are gathered with the leaves of the senna through the ignorance of the persons employed in their collection.

CY'NARA, a genus of *Compositæ*, in many respects like the Thistle. The two species most known are the Artichoke and the Cardoon.

C. scolymus, the Artichoke, came originally from the south of Europe, and, though it has long been cultivated in the regions of the north, it does not resist the very severe cold of winter. The root of the artichoke is rather bitter, the stem still more so. It was formerly employed as a diuretic, but it has long been cultivated only as a kitchen-garden plant. The artichoke when cooked is an agreeable food, not very nourishing perhaps, but easy to digest.

C. cardunculus, the Cardoon. The country of the cardoon is the same as that of the artichoke; it is found in the southern countries of Europe and in the north of Africa. When cooked it is tender, and its flavour greatly resembles that of the artichoke. It is in general a choice dish, and seldom seen except at the tables of persons in easy circumstances.

CYNARA'CEÆ, one of the primary subdivisions, in the system of Jussieu, of the natural order *Compositæ*. It is included in the *Tubuliflorœ* of De Candolle. Its type is the genus *Cynara*, to which belongs the common artichoke, *C. scolymus*.

The *Cynaraceæ* differ from the *Corymbiferæ* in their active properties possessing in a more intense degree the bitter principle of the whole order. None of them seem to have a tendency to develope the narcotic principle which characterises the *Cichoraceæ;* nor is the volatile oil which gives to so many of the *Corymbiferæ* a peculiar aromatic smell developed in these plants.

The *Carduus nutans*, Musk Thistle, is the only one which possesses any remarkable amount of odour. The prevalence of the bitter principle renders many of them useful stomachic, tonic, and febrifuge medicines. Some of them are said to be cathartic, as *Echinops sphærocephalus*, which has this property. The seeds of various species of *Onopordum* yield a fixed oil, which in some parts is expressed and used for domestic purposes. Many of the *Cynaraceæ* yield colouring matters. The *Carthamus tinctorius* yields a yellow colour. The *Serratula tinctoria* yields a yellow dye. A pigment of a blue colour is obtained from the flowers of *Centaurea cyanus*. Some of them secrete small quantities of tannin, and are used in consequence as astringents in medicine, as the *Onopordum acanthium*. Galls also are found on the *Cnicus arvensis*, which possess astringent properties owing to the tannin they contain. A number of species yield food. The bracts of the involucre are, in some, very large, and, as they contain starchy and other alimentary secretions, are used as diet by man. The artichoke is a familiar instance. The heads of the *Onopordum acanthium* are often eaten in the same way. The tender sprouts of the *Arctium Lappa* are gathered and eaten in the north of Europe. They are cooked in the same manner as asparagus. The tubers of the *Cnicus tuberosus* are frequently cooked and eaten, and many other species yield starch in their roots. Animals do not generally like the plants belonging to the Compositæ.

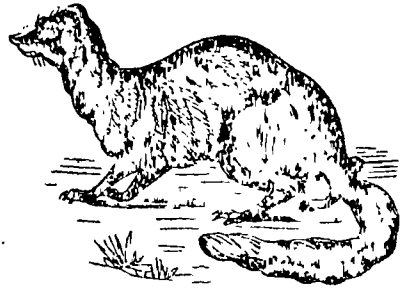
CYNICS, the name of a sect of Greek philosophers, who were so called, according to one interpretation of the word (*κυνικοί*, dog-like), from their snarling disposition, though it is possible that the name may have been derived from the gymnasium called Cynosarges, in which Antisthenes, the founder of this school, used to lecture. [ANTISTHENES.] The Cynics held that virtue was the only object at which men ought to aim, and that most of the sciences and arts, as they do not tend to make men virtuous, but sometimes, on the contrary, interfere with the attainment of it, are unprofitable and pernicious. The true philosopher, according to their notions, could discard all the comforts of life, and triumph over his bodily wants, so as to live only for virtue. The result of these principles was great strictness of morals and voluntary penance; and, as long as these characteristics were coupled with ability in the professors and consistent philosophy in what they taught, the sect maintained its position, and some members of it, as Antisthenes and Diogenes, obtained great celebrity. [DIOGENES.] At length the morality of the Cynics degenerated into shameless profligacy, and they became so disgusting from their impudence, dirty habits, and begging, that they lost all respect, and the sect dwindled into obscurity.

CYNICTIS, a genus of carnivorous Mammalia, established by Mr. Ogilby, and regarded by him as intermediate between the civets and the dogs. Dental formula:—

$$\text{Incisors, } \frac{6}{6}\text{; Canines, } \frac{1-1}{1-1}\text{; Molars, } \frac{6-6}{5-5}.$$

Of these last, the first three are spurious; the fourth is the carnassier, and the rest are tuberculated. Feet digitigrade; toes 5-4, with long falcular claws, adapted for digging; tail long and bushy.

Example.—*Cynictis Steedmannii*, Ogilby. As far as we know, this animal is the only species of the genus *Cynictis* hitherto discovered. It is a native of southern Africa (the borders of Caffraria), and in appearance, though not in colour, resembles an Egyptian Ichneumon. The general colour is a foxy red, mixed with silvery gray on the cheeks, neck, sides, and tail. Length of head and body, 1 foot 6 inches; of tail, 1 foot. This animal is burrowing in its habits. It is probably the *Meer-Kat* of Barrow ('Travels,' vol. i. p. 185). ('Trans. Zool. Soc.')



Cynictis Steedmannii.

According to Mr. Gray, this animal has been described by Cuvier as *Herpestes penicillatus*, and by Mr. Smith as *Herpestes Levaillantii*. It is evidently closely allied to the Ichneumons (*Herpestes*).

CYNOCEPHALUS. [BABOON.]

CY'NODON, a genus of grasses belonging to the tribe *Chlorideæ*. *C. dactylon* is a native of England on the shores of Devon and Cornwall. *C. linearis* is a native of the East, and is known by the name of *Durvagrass*.

CYNOGLOSSUM, a genus of plants belonging to the natural order *Boragineæ*. The species are herbs, with soft leaves. *C. officinale*, Common Hound's Tongue, is a native of Asia, Africa, North America, and Europe. It is found in Great Britain in waste ground. The whole plant has a disagreeable smell, resembling that from mice. It is said to possess narcotic properties, and was at one time used as a remedy in scrofula, but it is not employed in medicine at the present day. *C. montanum* is found in Great Britain, by roadsides and in hedges in shady situations.

About fifty other species of *Cynoglossum* have been described, besides the British ones above named. They are all coarse plants, having only small flowers, so that few only are desirable for ornamental cultivation.

CYNOMORIA'CEÆ, an obscure order of Rhizanths. The order is represented by *Cynomorium coccineum*, the *Fungus melitensis* of the old herbalists, a plant once in repute for its astringent properties, but now valued only for its rarity and the botanical interest that attaches to it. Dr. Walsh tells us that it grows most plentifully on a detached rock on the south-west side of the island of Gozo. It is there much celebrated for its medicinal properties. The time of the discovery of its virtues is not known; but, from some ancient MSS., it appears to have been at a very remote period. About the year 1740, the Knights of Malta set such a very high value on this fungus, that they interdicted the approach of any person to the place where it grew, and guarded the passage with the strictest jealousy. Even after the English took possession of Malta, and succeeded to the territorial rights of the order, and, amongst other things, to the possession of this rock, a keeper was appointed to take care of it, as previously, with a salary. The fungus thus continued to be guarded and regularly gathered, deposited in the state-office, and distributed among the hospitals; and when Dr. Hamilton visited this rock he was accompanied by the keeper.

CYNOSU RA (*κυνὸς ὐρά*, the Tail of the Dog), a name given to the Lesser Bear. According to Aratus and Hyginus, Cynosura was one of the nymphs of Mount Ida who nursed Jupiter. But it is at least as probable that, before the Greeks adapted their mythology to the constellations, they had from some oriental source the habit of figuring Ursa Minor as a dog, and that the tail of the dog was the pole star. Many persons may probably know this word only from the two lines of Milton's 'Allegro'—

> Where perhaps some beauty lies,
> The Cynosure of neighbouring eyes.

CYNOSU'RUS CRISTA'TUS, a well-known pasture grass, called by farmers Crested Dogstail Grass, or Gold-Seed, exceedingly abundant in all natural and artificial grass land.

Although this grass forms so constantly a portion of all good pastures, it is chiefly on account of the fineness and closeness of its herbage that it is valuable, the quantity of hay that it produces being inconsiderable. Mr. Sinclair hence observes, that 'it is inferior for the purposes of hay, but admirably adapted for permanent pastures. The roots penetrate a great way under ground; from which circumstance it remains green after most other grasses are burnt by a continuance of dry weather. In irrigated meadows it arrives at a greater size than in any other situation.'

Crested Dogstail Grass (*Cynosurus cristatus*).

CY'NTHIA, one of the sub-genera into which Savigny has divided the ascidian Mollusks. [ASCIDIA.] In structure this genus approaches to Boltenia [BOLTENIA], but there is no pedicle.—Example, *Cynthia momus*. This ascidian does not attach itself to rocks, but makes shift to float about in the Gulf of Suez, attaching itself to marine plants. (Savigny's *Mém. sur les Anim. sans Vertèb.*, 1816; and 'Linn. Trans.,' vol. xiv., *Anat. Obs. on Tunicata*, by Mr. W. S. Macleay.) Latreille distinguishes a genus of coleopterous insects by the term *Cynthia*.

CYPERA'CEÆ, an extensive natural order of glumaceous Endogens, having much the appearance of grasses, with which they are sometimes popularly confounded. A large proportion of the order bears the name of *Sedges*, and hence the Sedge Family or Tribe is given to these plants as their English appellation. They are mostly inhabitants of marshy or swampy grounds, a few are met with on dry upland pastures, and a good many are Alpine plants. They occur in all parts of the world, and are generally abundant; but little or nothing has been discovered of their uses: their most common application is to the manufacture of what are called erroneously rush mats and

rush bottoms for chairs. The plant used in this country for such purposes is not any kind of rush, but the cyperaceous species, *Scirpus lacustris*. It is not a little remarkable that, nearly as these plants are allied to grasses, they scarcely at all participate in the nutritious quality of that useful order. It is only among the coarse bad herbage of marshes that they are allowed to form a constituent of hay.

CYPRÆ'IDÆ (*Porcellanen* of the Germans, *Porcelaines* of the French), a family of marine gasteropodous Mollusks (order *Pectinibranchiata*, Cuvier), of which the shells are common as ornaments on mantel-pieces, and of which those of one species (*C. moneta*) are used in some parts of the East as a circulating medium of exchange. [Cowry Shells.]

Family Character.—Animal unisexual, elongated. Head distinct, with two conical or subulate tentacula of some length, at the external base of which are situated the two sessile eyes on small projections; mouth vertical, at the bottom of a small cavity, and containing a lingual riband, or lamina, beset with tentacles and prolonged in the abdomen. Branchial cavity open, situated near the back of the neck; gills arranged in a longitudinal pectinated series on the inside of the columella on the left side of the mantle; siphon very short, and formed in the mesial line by the edges of the two lobes. Mantle bilobated, the lobes very large, with extended aliform edges, capable of being reflected over the back of the shell so as to join on the mesial dorsal line. Foot oval, elongated, very large. Vent at the extremity of a tube behind the branchial cavity. Male organ situated more forward, and communicating with the orifice of the deferent canal by means of a furrow. Adult shell involute, highly enamelled, oval or oblong, more or less rounded or cylindrical, with a small and imbedded spire; aperture longitudinal, nearly straight, toothed, or plaited, on each side, with a channel or groove at each end; inner lip flattened or sub-concave, outer lip involute. No operculum.

Mr. Gray thus notices the changes of form which the young shell undergoes in its progress to perfection:—'The shell alters its appearance considerably according to the age of the individual, and exhibits three very distinct stages. In the young or first stages the shell is generally smooth, of a plain grayish colour, or with three longitudinal bands, and the upper part of the inner lip is smooth and convex, the lower part flat or concave, the outer lip thin. In the second stage the shell begins to assume more the character of the genus, as the outer lip begins to be inflected or rather thickened, and approaches nearer the perfect appearance of the species as the second coat of colour is deposited, but differs from it in the want of thickness of the shell and the spire being more distinct, and in the want of the dorsal line, which is usually distinct in the third or perfect state, where the last coat has been deposited, and the aperture is more plaited on both sides. The colouring, or at least the disposition of the colouring here, is a much more certain characteristic of species than either the general outline of form or size, the latter of which is exceedingly various. In this family I have often observed full-grown specimens of *C. Arabica* from one to three inches long. This peculiarity is attempted to be explained by Lamarck and others, who assert that when the animal has formed a complete shell, as it has not the faculty of enlarging its size, it is obliged to quit its shell and form a new one, in the same manner as the *Annulosa* cast their skins, and by that means the same animal forms many shells; but I believe there is not the slightest ground for this notion.'

Mr. Gray has recently observed, that sometimes, though rarely, the young shells of *Cypræa*, especially *C. Arabica*, have the inner edge of the outer lip thickened, and furnished with a compressed sharp-edged series of teeth.

Geographical Distribution, Habits, &c.—Cypræidæ abound both in the old and new world, but their greatest development both in point of size and number of species takes place in warm climates. A very few species are inhabitants of the European seas. The family are littoral, and are generally found under stones or rolled corals.

The genera are numerous:—

1. *Cypræa*, divided by Mr. Gray into five sections, according to various minor points of distinction.—Examples, *Cypræa Mappa, C. Talpa, C. Cicercula, C. Childreni, C. Adansonii.*

2. *Aricia*, divided into three sections.—Examples, *Aricia guttata, A.* (*Cypræa*) *moneta, A. angustata.*

3. *Naria.*—Example, *Naria irrorata.*

4. *Luponia.*—Example, *Luponia Algoensis.*

5. *Cypræovula.*—Example, *Cypræovula Capensis.*

6. *Trivia.*—Examples, *Trivia carnea, T. Europœa, T. Pediculus, T. pustulata* (four sections).

7. *Erato.*—Example, *Erato scabriuscula.*

8. *Ovulum* (*Ovula*, Lam., commonly called Poached Eggs), arranged in seven sections.—Examples, *Ovulum ovum. O. verrucosum, O. Margarita, O. pyriforme, O. gibbosum, O. longirostratum* (Goodhall's False Spindle), *O. volva* (Common Weaver's Shuttle).

Fossil Cypræidæ.—Fossil shells of the *Cypræidæ* are very numerous, but do not appear to be found below the supracretaceous group. Several species occur in Britain in the London Clay and Crag; and on the Continent in the Calcaire Grossier in the environs of Paris; at Laugnan, near Bordeaux, and in Normandy; in the Netherlands also, and in Italy and Piedmont.

Mr. Gray makes the whole number of species of *Cypræidæ*, including the fossil as well as recent species, 174. But within the last few years a great number of new species has been added to the catalogue. Five are described in the 'Proceeds. Zool. Soc.,' 1846.

For an able article 'On the Growth and Recalcification of the Shell in *Cypræa*,' see 'Proceeds. Zool. Soc.,' 1845, p. 133. It is too long to quote, and cannot be well abridged, as it is itself condensed. We venture, however, as a note upon the last few lines quoted from Mr. Gray, to make the following extract:—'The animal does not quit the shell, as Lamarck supposed, but dissolves

the outer portion with its acetose juices. All visible trace of the shell may be thus removed without weakening M. Deshayes' proposition, founded on the circumstance of the mantle being the only organ charged with the secretive fluid. The mantle is always capable of extension over the shell, and the same power which furnishes the adult with its last coating of enamel can be exerted in the formation of as many superincumbent layers as may be necessary to replace all that has been decomposed. That a dissolution takes place there can be no doubt. "The shell gradually swells," says Lieutenant Hankey, "and cracks, becomes thinner and duller in colour, and finally disappears;" a circumstance which may be easily credited when it is remembered that the *Murex* possesses the faculty of removing spires or any similar obstacles to its advancement of growth; and that the *Pholades* and other terebrating Mollusks exercise a power of absorbing which enables them to penetrate the hardest limestone rock. The microscopical structure of the Cowry Shell is, moreover, of a nature peculiarly tenacious of absorption; it is composed of a large quantity of carbonate of lime in proportion to the amount of membranous substance: and this accounts for its substance becoming vitrified, as it were, to such a highly polished state of enamel when in contact with the acidity of the soft parts.'

CYPRESS. [CUPRESSUS.]

CYPRIA'NUS, ST., THA'SCIUS CÆCI'LIUS, one of the most eloquent of the Latin fathers, was Archbishop of Carthage towards the middle of the third century. He was probably born about A.D. 200, at Carthage, where, before his conversion to Christianity, he acquired considerable affluence as a teacher of oratory. His career as a Christian appears not to have exceeded ten or twelve years; for it was not until about the fiftieth year of his age that he was gained over to the church of Carthage by Cæcilius. Having held for two years the office of presbyter, he was importuned by the people to become their bishop, which he became after making a strenuous resistance. The persecution under the Emperor Decius having soon afterwards commenced, Cyprian fled, and concealed himself during about a year and a half. When the persecution was abated, Cyprian returned to Carthage, and, being reinstated in his bishopric, he held several councils, at one of which 85 bishops attended to legislate concerning the rebaptizing of heretics, apostates, and deserters, who, after escaping the severity of Decius by renouncing their religious profession, desired to be readmitted into the church. On the renewal of the persecution, about six years afterwards, by the Emperor Valerian, Cyprian was banished to Curubis, about 40 miles from Carthage. By Galerius, the successor of Valerian, he was restored to his former dignities; but, on his refusal to sacrifice to the pagan deities in obedience to the emperor's commands, he was seized by a band of soldiers, and beheaded as an enemy to the gods, and a dangerous seducer of the people.

His writings are numerous and valuable, as containing much curious and important information concerning the doctrines and discipline of the primitive church: they consist of two kinds, epistles, and tracts or sermons.

There are several good editions of his works, among which may be mentioned that of the 'Opera Omnia,' Oxford, fol., 1682, and Amsterdam, 1700; but the editio optima is that of Paris, in fol., 1726. The following translation of the whole is in general accurate and faithful: 'The genuine Works of St. Cyprian, with his Life, as written by his deacon Pontius, all done into English from the Oxford edition, and illustrated with notes, by Nathaniel Marshall, LL.B.,' fol., 1717. The whole works and life have also been translated into French, by Lombert, 1682. Translations of separate tracts are very numerous.

CYPRI'NIDÆ, a family of fishes of the section *Malacopterygii Abdominales*. The family characters are as follow:—Mouth small, formed by the intermaxillary bones, and generally devoid of teeth; the pharyngeans furnished with strong teeth; the branchiostegous rays few in number, and the scales generally of large size; palate furnished with a thick, soft, irritable substance; dorsal fin single. Locality, fresh waters. Diet in a great measure herbivorous. Cuvier divides this group into the following genera:—1. *Cyprinus*, of which the Carp (*C. carpio*), the Crucian Carp (*C. gibelio*), and the Gold Carp (*C. auratus*) are well-known examples. 2. *Barbus*, of which the Barbel (*B. vulgaris*) is a common species, especially in the upper parts of the Thames. 3. *Gobio*, illustrated by the Gudgeon (*G. fluviatilis*). 4. *Tinca*, of which the Tench (*T. vulgaris*) is well known. 5. *Cirrhinus*, not British. 6. *Abramis*, of which we have the Bream (*A. brama*), and the White Bream (*A. blicca*). 7. *Labeo*. 8. *Catastomus* (species foreign). 9. *Leuciscus*, of which we possess the Ide (*L. idus*), the Dobule Roach (*L. dobula*), the Roach (*L. rutilus*), the Dace (*L. vulgaris*), the Grayling (*L. Lancastriensis*), the Chub (*L. cephalus*), the Red Eye (*L. erythropthalmus*), the Azurine (*L. cæruleus*, Yarr.), the Bleak (*L. alburnus*), the Minnow (*L. phoxinus*). 10. *Cobitis*, of which the Loach (*C. barbula*) is familiar to all. 11. *Gonorhynchus*. 12. *Anableps*. 13. *Pœcilia*. 14. *Lesbias*. 15. *Fundulus*. 16. *Molinesia*. 17. *Cyprinodon*, of which the species are all foreign. (Cuvier's *Règne Anim.*, tome ii. p. 270, et seq.; and Yarrell's *British Fishes*, vol. i. p. 305, et seq.)

CYPRINUS. [CYPRINIDÆ.]

CYPRIPE'DIUM, a genus of plants belonging to the natural order *Orchideæ*, and the tribe *Cypripedieæ*. *C. calceolus*, Lady's Slipper, has been found in Great Britain, but is extremely rare. All the species are exceedingly elegant plants. They are mostly inhabitants of North America and Northern India.

CYPRUS, a large island in the Mediterranean, lying about 60 miles from the coasts of Syria and Asia Minor. Its length, from Cape Sant' Andrea at the north-east extremity to its most western point, Cape San Epiphanius, the ancient Arsinas, is 140 miles. Its greatest breadth, from Capo Gatto on the south coast to Capo

Khromachiti on the north, is about 50 miles; but it gradually narrows towards the east, being no more than 5 miles wide near Cape Sant' Andrea. The ancient Olympus, now called Santa Croce, rises in the centre of the island, and two principal ranges of mountains run in the direction of its length, keeping closer to the north than to the south coast. The height of Santa Croce is about 7000 feet above the sea-level. The most extensive plain, called Messarea, is in the south-east part of the island, and is watered by the river Pedæus, which is however nearly dry in summer, like all the other rivers of the island. The soil is naturally fertile, and formerly maintained a population of nearly 1,000,000; but the number of inhabitants now is only 100,000, of whom 70,000 are Greeks, and 30,000 Turks. From neglect and oppression, the inhabitants are in a state of the greatest misery. Cotton of the finest quality, excellent wine, and all kinds of fruit are produced; but agriculture is in a most backward state. Besides the productions already named, madder, opium, oranges, lemons, pomegranates, &c., are grown. The carob-tree abounds in some districts; its succulent pods are exported to Egypt and Syria, while the fruit called St. John's Bread is used as an article of food. On the mountains are forests of fine timber. Sheep and cattle thrive. Copper, asbestos, talc, rock-crystal, and various other minerals are found. Salt is made on the sea-shore. Game and fish are plentiful. The island is infested with snakes, tarantulas, and venomous spiders; and sometimes almost every green herb and leaf is devoured by clouds of grasshoppers from the neighbouring continent. The climate is cold in winter, owing to the winds that blow from the mountains of Asia Minor and Syria. In the plains the heat of summer is excessive, but it is moderated by the sea breezes. Rain is very rare in summer, and, as irrigation is neglected, of course there is very little verdure. Some districts are unhealthy, from want of drainage and the consequent malaria. The total value of the exports, in 1841, was 56,595*l.*, and of the imports, 25,327*l.*

The chief towns of Cyprus are—1. Lefkosia, or Nikosia, the capital of the island, and the residence of the Turkish governor, which is near the site of the ancient Letra, or Leucotra. Its population is said to be above 12,000; it lies in the centre of the island, in a plain surrounded by mountains. Lefkosia was the residence of the kings of Cyprus of the Lusignan dynasty, and was then much larger than at present; the Venetians destroyed part of it in order to strengthen the remainder. It is now 3 miles in circumference. The church of Santa Sophia, a fine Gothic building, is converted into a mosque. There are also a fine bazaar; a khan, surrounded by apartments for travellers; and the palace of the governor, on the portal of which is still seen the Venetian lion in stone; and several other churches and mosques. The Archbishop of Lefkosia is metropolitan of the whole island. 2. Famagusta, on the south-east coast, a few miles south of old Salamis (which was built by Teucer, son of Telamon), is a town strongly fortified by the Venetians, but now much decayed. 3. Larnika, on the site of old Citium, near the south coast, is the most thriving bustling place in the island, being the residence of the European consuls and factors, and the seat of the chief trade. The port of Larnika is at Salines, about 1½ mile from it. A Greek bishop resides at Larnika, and there are also some Latin churches in the town. The houses are built chiefly of clay, and only one story high above the ground-floor, on account of the earthquakes to which the island is subject. The principal exports consist of cotton, wine, the best of which is produced near Limasol, salt, corn, opium, turpentine, silk, and fruit. 4. Limisso, or Limasol, near the ancient Amathus; the country here is very fertile in vine and other fruit-trees; carob-trees are especially abundant. 5. Baffo. 6. On the north coast is Cerini, the ancient Cerinia, with a fort and a small harbour, from which there is some traffic with the opposite coast of Caramania.

Cyprus appears to have been colonised by the Phœnicians at an early period. Amásis, king of Egypt, is said to have invaded Cyprus and taken Citium. The island became subject to the Persians (Herod., v. 108), and afterwards submitted to Alexander the Great, upon whose death it fell, with Egypt, to the share of Ptolemæus, the son of Lagus. It continued under the Ptolemies until Publius Clodius Pulcher obtained a decree to be passed for reducing the island to a Roman province. (Strabo, 684; Dion, xxxviii. 30.) Upon this, Marcus Cato was sent to execute the decree, and Cyprus thus became a Roman province. On the division of the empire it fell to the Byzantine emperors. Richard Cœur de Lion took it in 1191, and sold it to the Templars, whose oppression drove the people to revolt. Richard resumed the sovereignty, and gave it to Guido of Lusignan, the expelled king of Jerusalem, in 1192. The Lusignans retained it till 1489, for nearly three centuries, which was a flourishing period for Cyprus. It then passed into the hands of the Venetians, who kept possession of the island till 1570, when the Turks invaded it, took Lefkosia by storm, and massacred about 20,000 people. They then laid siege to Famagusta, which was long and gallantly defended by the proveditor-general, Marcantonio Bragadino. At last, in August 1571, the Venetians were obliged to capitulate, on condition of being sent safely home. The terms of the capitulation were violated by the pacha Musthpha, who had all the Venetian officers seized and put to death, except Bragadino, whom, after some days, he caused to be led naked into the square of Famagusta, and there flayed alive in his presence. From that time the Turks have remained in possession of Cyprus. During the unsuccessful revolt of 1822, 25,000 Greeks were massacred, the women and children sold as slaves, and the villages, churches, and monasteries of the Greeks destroyed.

(Mariti, *Travels;* Paruta, *Historia Venetiana;* Botta, *Storia d'Italia;* Murray's *Hand-book for the East;* Macgregor's *Statistics.*)

CYR, ST. (Seine-et Oise.)

CYRENA'ICA, a region of North Africa,

comprehending the country between the Great Syrtis and the Gulf of Platea, now Bomba. The limits between Cyrenaica and the Carthaginian dominions were fixed at the Philænorum Aræ, at the bottom of the Great Syrtis, and its east limits towards Egypt seem to have been about the Catabathmus Magnus. Cyróne, Teuchira, afterwards called Arsinoe, and Hésperis, afterwards Berenice, were the earliest Greek colonies. Barca was a colony of Cyrene, and the port of Barca was afterwards the city Ptolemais, now Ptolemeta. The port of Cyrene, called Apollonia, became also an important town. From these five cities, Cyrene, Apollonia, Ptolemais, Arsinoe, and Berenice, the country was sometimes called Pentápolis, or The Five Cities. The interior was peopled by Libyan tribes. This interesting region was unexplored by European travellers until an Italian, Dr. Della Cella, in the service of the pacha of Tripoli, visited it in 1817. In 1821–2 Captain Beechey, R.N., and H. W. Beechey, explored the coast of the Pentapolis, as well as the ruins of Cyrene: 'Expedition to explore the North Coast of Africa from Tripoli eastward, comprehending an Account of the Greater Syrtis and Cyrenaica, and of the ancient Cities composing the Pentapolis,' 4to., London, 1828, with maps and plates. Lastly, this country was visited by M. Pacho, a young and enterprising French traveller.

The Beccheys visited the Cyrenaica from Tripoli, and went by the shores of the Great Syrtis to Bengazi.

As the traveller approaches Bengazi from the south, he sees the country improve; he enters a new region of hills and plains covered with vegetation. The coast stretches to the north-east, forming a curvilinear peninsula which advances into the Mediterranean, between the Great Syrtis to the west and the Gulf of Bomba to the east. The chord of this curve from Bengazi to Bomba is about 150 miles, but the sweep of the coast is above 200. A ridge of mountains from 800 to 1100 feet high begins to the south-east of Bengazi, and extends to the north-east in a diagonal direction to the shore. Farther inland is another range, nearly 2000 feet above the sea, which forms the plateau on which Cyrene stood. To the south and south-west the mountains of Cyrene slope gradually to the level of the Libyan desert and of the sandy tract which borders the Great Syrtis. According to Pacho, the greatest breadth of the hilly region from north to south is between 70 and 80 miles. Towards the north, both the higher and lower regions are frequently broken by deep wadys or chasms, through which the winter torrents rush to the sea. Clusters of date-trees are seen near Bengazi and Derna. The road from Bengazi to Tocra, or Teuchira and Ptolemeta, lies through a very fertile and beautiful country, though a comparatively small part of it is cultivated. The whole length of the plain from Bengazi to Ptolemeta is 57 geographical miles.

Of the five towns of the Pentápolis, Bengazi is generally believed to occupy the site of the ancient Hesperis. The next town on the coast is Tocra, the ancient Teuchira, afterwards called Arsinoe, which, although totally deserted, is still inclosed, except on the sea or north side, by walls of uncommon solidity and thickness. Ptolemeta, or Dolmeta, is also ruined: several of the buildings however are partly standing, such as a lofty gateway, an amphitheatre, two theatres, a palace or large building, the inner court of which retains its tesselated pavement; several columns are still erect, and a number of others are thrown down in heaps. Barce, or Barca, was occupied by the Arabs, who gave its name to the whole country of the Pentápolis; but the town sank at last into total desolation, and even its site is not now ascertained. Ptolemeta lies in a delightful position at the foot of the hills, and on a slope stretching to the sea between two romantic wadys or ravines. Its extent, as far as it can be traced, was about one square mile; but the whole space is now overgrown with wild vegetation, with patches of corn here and there among the ruins. The Arabs sow the corn and leave it to the winter rains, and they return at harvest-time to cut and carry it off.

The road from Ptolemeta to Cyrene leads up a romantic valley, the sides of which are thickly clothed with pines, olive-trees, and various kinds of laurel, interspersed with clusters of luxuriant honeysuckles, myrtle, arbutus, juniper, and a variety of wild roses, and then opens into the plain of Merdje, a large and fertile tract about 5 miles in breadth, on the summit of the first range of mountains, with pools and small lakes formed by the waters from the upper ridge. The Arabs encamp here, and partly sow the ground with corn, and use the rest as pastures. From the plain of Merdje the path follows the track of the ancient road in a north-east direction, leading through a succession of hills and fine valleys to Ghrenna, the Arab name for Cyrene. On approaching Ghrenna the country becomes more clear of wood, the valleys produce fine crops of barley, and the hills afford excellent pasture for cattle. A plant, 3 feet high, perhaps the silphium of the ancients, and resembling in shape the hemlock, grows here in great abundance. This is probably the plant which is represented on the coins of Cyrene. The position of Cyrene is one of the finest that can be imagined, being on the edge of the upper range of hills, about 800 feet above the lower range. The slope of the lower ridge, which runs along the coast of Cyrenaica, is thickly covered with wood, and its height is about 1000 feet; so that Cyrene is about 1800 feet above the sea, of which it commands an extensive view. The remains of Cyrene occupy a vast extent, but the ruins are in a very mutilated condition. There are two copious springs, from one of which the water flows into a subterraneous channel, and then issues out on the other side of the mountain.

The country around Cyrene must have been in the time of its splendour a complete garden. Even now, 'the rich ochrish red soil, watered by gushing rivulets on every side, brings forth a rich vegetation which pierces the mossy rocks, clothes the hills, extends in rich pastures, or developes itself in forests of dark juniper, green thaya, and pale olive-trees. The modern name of the Cyre-

naica, Jebel Akhdar, 'the Green Mountain,' expressly indicates its rich and smiling aspect.' (Pacho, 'Voyage dans la Marmarique et la Cyrenaique.')

CYRENA'ICS, a school of Greek philosophers, who derived their name from the birth-place of their founder, Aristippus. Like the Cynics, their doctrines were a partial development of those of Socrates; but the only thing in which the two sects agreed with the original system, and with one another, was that they all three made virtue consist in knowledge. Plato, and in some measure the Cynics also, placed the chief good in the attainment, by means of dialectic, of the abstract idea of the good; but the Cyrenaics placed it in the collection of the greatest number of agreeable perceptions; and the true philosopher, according to them, was one who actively, methodically, and successfully carried on the pursuit of pleasure. The chief successors of Aristippus were Theodórus, Hegesias, and Anniceris. Theodorus perceived the necessity for some principle, in addition to the mere collection of agreeable sensations; for, without some effort of the understanding to determine which of many gratifications was to be preferred, it would be impossible, he thought, to obtain the maximum of gratification; and he therefore set the understanding over the senses as a regulating and restraining faculty. Hegesias, following in the steps of Theodorus, insisted still more than he did upon the inadequacy of the senses as the criteria of the desirable, and at last even went so far as to assert that nothing was in itself either agreeable or the contrary, and that life, and every thing in life, should be a matter of indifference to the wise man. In the philosophy of Anniceris and his followers, the original principles of the Cyrenaics were quite lost; and though he also, in a popular way, recommended the pursuit of the agreeable, he denied that it depended in any way upon mere sensible impressions, for the wise man may be happy in spite of all annoyances; that friendship was to be sought, not for the sake of any immediate advantage to be derived from it, but on account of the good-will which it generated; and that for a friend's sake a man should encounter even annoyances and troubles. These are the doctrines of a mere popular morality, and can hardly be ascribed to one school more than to any other. The Cyrenaics placed the great object of man in the positive and active pursuit of the agreeable, while Epicurus made it consist in a perfect rest of mind and in freedom from pain; for he considered the agreeable as something merely negative, as the pleasing harmony produced by exemption from all passion and appetite. The philosophy of Epicurus may therefore be considered as the successor, in one point of view, of the system of Aristippus.

CYRE'NE, a city of Libya, near the coast, to the east of the Great Syrtis, was founded B.C. 631, by a colony from Thera, an island in the Ægean Sea. Thera itself was a Lacedæmonian colony (Herod., iv. 148.) Battus, the leader of the colony of Cyrene, was one of the principal citizens of Thera. The colonists first settled on the coast of Libya and in an island called Platea; afterwards they removed to Aziris, where they remained six years, and at length settled in the place which they called Cyrene. There was a series of kings of Cyrene, beginning with Battus I., who died about B.C. 591. About B.C. 450 the government appears to have changed to a republic. Cyrene became subject to Egypt in the reign of the first Ptolemæus, and so it continued till the time of Ptolemæus Physcon, whose bastard son Apion, being in possession of the chief power, gave it into the hands of the Romans about B.C. 97.

Coin of Cyrene British Museum. Actual Size. Gold.

Cyrene produced many celebrated persons: Aristippus, his daughter Areta, and her son Aristippus, Anniceris, Eratosthenes, and Carneades, besides Callimachus, the poet.

CYRIL, ST., of Jerusalem, was born in that city about A.D. 315, and received among the clergy there an education for the church. In 345 he was ordained priest and catechist by Maximus, the patriarch, or, which in fact is the same thing, archbishop of Jerusalem. On the death of that prelate, A.D. 350, Cyril was chosen to succeed him. The zeal with which St. Cyril enforced and defended the doctrine of the consubstantiality of the Son occasioned Acacius, the Arian bishop of Cæsarea, to commence a course of persecution against him which terminated in his deposition by a council, A.D. 357. On this he retired to Tarsus until 359, when, by a council of Seleucia, he was re-established in his see; but, through the party of Acacius, he was immediately deposed a second time by a council of Constantinople, A.D. 360. On the accession of Julian, who recalled all the exiled bishops, Cyril returned to his bishopric, from which, under the Emperor Valens, he was expelled a third time by Eudoxus, the Arian bishop of Constantinople, A.D. 367. Finally, under Theodosius, who favoured the Trinitarian sect, he was again restored by a council of Constantinople in 381; and, notwithstanding the ambitious and schismatic contests of the bishops and clergy, he remained in his see until his death, A.D. 386.

The extant writings of St. Cyril are in the Greek language, and consist of eighteen books of catechéses, or sermons, delivered during Lent to the catechumens, called before baptism Illuminati: five similar discourses delivered during Easter week to the neophytes, after baptism called Mystagogi, being explanatory of the mysteries of the Christian sacraments: a treatise on words: and the letter to Constantius: besides which, several homilies and epistles are sometimes improperly included.

For a list of editions of Cyril see Watt's 'Bibliotheca Brit.' Milles's ed. of the 'Opera Omnia,'

Græce et Latine, fol., 1703, contains notes, three indices, and the various readings; but the editio optima is that by Augustus Touttée, a Maurist monk, Gr. et Lat., fol., 1720.

CYRIL, ST. (CYRILLUS), of Alexandria, was educated under his uncle Theóphilus, the bishop of Alexandria, by whom St. Chrysostom was persecuted and deposed. On the death of Theophilus, A.D. 412, Cyril was elected patriarch, that is, archbishop of Alexandria. His episcopal power was first displayed in shutting up and plundering the churches of the puritan sect founded by Novatian. Cyril next exhibited his zeal against heretics by heading a furious mob of fanatics, who drove out all the numerous Jewish population from Alexandria. This proceeding created a quarrel with the governor, Orestes, who was soon afterwards attacked by a band of 500 monks. One of these, who had severely wounded him, being put to death on the rack, Cyril eulogised him as a glorious martyr. The tragic story of Hypatia, the daughter of the mathematician Theon, of Alexandria, furnishes further evidence of the revengeful disposition of St. Cyril. This lady, whose wonderful abilities enabled her to preside over the Alexandrine school of Platonic philosophy, was the especial object of the bishop's envy and malice; and her murder, attributed to Cyril and his clergy, is circumstantially related by several ecclesiastical historians. (Socrates, l. vii. c. 13 and 15; Nicephorus, l. xiv. c. 16; Damascius, in 'Vita Isidori;' Hesychius and Suidas, in '*Ταραία*;' Photius, 'Annot. ad Socrat.,' l. vii. c. 15.)

The titles of 'Doctor of the Incarnation' and 'Champion of the Virgin' have been given to this bishop on account of his long and tumultuous dispute with Nestorius, bishop of Constantinople. The condemnation and deposition of Nestorius having been decreed by Pope Celestine, Cyril was appointed his vicegerent to execute the sentence, for which he assembled and presided at a council of sixty bishops at Ephesus. But John, the patriarch of Antioch, and forty-one bishops who supported Nestorius, having excommunicated Cyril, the two parties appealed to the Emperor Theodosius, who forthwith committed both Cyril and Nestorius to prison. Cyril, by the influence of Celestine, was at length liberated and restored, A.D. 431, to the see of Alexandria, which he retained until his death, A.D. 444.

His works are numerous, and chiefly on subjects connected with the Arian controversy, the incarnation, consubstantiality of the Son, and similar difficult points, which are involved in additional obscurity by an intricate perplexity of style and the use of barbarous Greek. The editio optima of the 'Opera Omnia' of Cyril is that in 7 tom. fol., Greek and Lat., Paris, 1638. Spanheim's edition of Julian's works contains Cyril's work against Julian.

CYRTANDRACEÆ, a small natural order of irregular-flowered monopetalous Exogens, scarcely distinct from *Bignoniaceæ* by any positive characters, although they have a very peculiar habit. The species inhabit the East Indies chiefly, a few only being met with in other warm parts of the world. They are all beautiful in their flowers, but they are of no known use.

CYRTOCERAS, a nautiloidal genus of fossils, proposed by Goldfuss, which occurs in the palæozoic strata of Devon, the Eifel, and Ireland principally, and includes many species of great beauty and interest. The septa are pierced by a subdorsal siphon: the last whorl finishes in a straight extension.

CYRUS I., founder of the Persian monarchy, began to reign about B.C. 559. According to Herodotus, Cyrus was the son of Cambyses, a Persian, and Mandane, daughter of Astyages, king of Media. (Herod., i. 91.) In consequence of Astyages dreaming a dream which portended that the offspring of his daughter would take the throne of the Medes, he ordered Cyrus to be destroyed as soon as he was born. Harpagus, a person of rank in the king's household, was charged with the commission, but he gave the child to the king's herdsman to put to death. The herdsman's wife, who was just delivered of a still-born male child, persuaded her husband to preserve the life of the royal infant, and their own dead child was exposed instead of Cyrus, whom they brought up. Among his boyish playmates Cyrus exhibited all the royal symptoms of an inclination to command. In their games the youths made him king, and the severity with which he enforced his orders on one occasion led to his being brought before Astyages, who recognised his likeness to himself, and found that the time of the exposure of his grandson and the age of Cyrus agreed. The circumstances of his preservation were disclosed, and he was sent to his real parents. Harpagus, who had been cruelly treated by Astyages for his conduct in the exposure of Cyrus, induced him to rise against Astyages, who was dethroned B.C. 560. Cyrus next attacked and took Sardis, and made Crœsus prisoner B.C. 546. [CRŒSUS.] He besieged and took the city of Babylon B.C. 538. At last he carried his arms against the Massagetæ, and was defeated and slain by Tomyris, their queen (B.C. 529). He reigned twenty-nine years. This is the account given by Herodotus, which, with a few variations, is copied by Justin. Xenophon's work on the education of Cyrus is an historical romance. Both Xenophon and Ctesias ('Persica,' c. 8) make Cyrus die quietly a natural death. (See the last chapter of Cicero 'De Senectute.') The account of Ctesias as to his death is conformable with the story in Arrian of the body of Cyrus being interred at Pasárgadæ. [ALEXANDER III.] The fame of Cyrus lasted to the downfal of the Persian empire; he was regarded by his countrymen as their national hero, and his fame is still preserved in the annals of modern Persia. The capture of Babylon by Cyrus is the point at which sacred history first touches on profane. Cyrus left two sons: Cambyses, who succeeded him on the throne; and Smerdis, who was murdered by the command of Cambyses. (Herod. iii. 30.)

CYRUS the Younger was the son of Darius II. and Parýsatis. Artaxerxes, the eldest son of Darius, succeeded him as king, but Cyrus disputed the right of succession. Cyrus was the favourite

of his mother, Parysatis, and was indebted to her intercession with Artaxerxes for the preservation of his life after he had been charged with a conspiracy against the king. He was sent back to his government in the western provinces of Asia Minor, but did not relinquish his designs on Artaxerxes. He raised a large force of barbarians and a body of Greek troops with the assistance of Clearchus and others. He set out from Sardis, the seat of the Persian authority in Western Asia (B.C. 401), and met his brother in the plain of Cunaxa in Babylonia who had an immense army. The army of Artaxerxes was soon routed, but Cyrus fell in a personal conflict with his brother. After the battle the Greeks who were in the army of Cyrus effected a retreat to Trapezus (Trebizond) on the Black Sea. [ANABASIS.]

The character of Cyrus is highly eulogised by Xenophon ('Anab.,' i. c. 9). Cyrus was fond of agricultural and horticultural labours, and worked with his own hands.

(Xenophon, *Anabasis*; Plutarch, *Artaxerxes*; Diodorus Siculus, xiv.)

CYSOING. [NORD.]

CYSTI'NGIA, a sub-genus of the *Tunicata*, (one of the ascidian mollusks) [ASCIDIA], in some points allied to *Boltenia* [BOLTENIA].—Example, *Cystingia Griffithsii*. It is found in the northern seas of America. For an illustration of anatomical details, we must refer to the 'Linn. Trans.,' vol. xiv. tab. 19. Mr. Griffith's specimen was taken in Fox's Channel; and two specimens were obtained under Captain Sir J. Ross, near Felix Harbour.

CYSTIPHY LLUM, a genus of *Madrephylliœa*, proposed by Lonsdale, to include species which have a vesicular internal structure, instead of clearly defined horizontal diaphragms and vertical lamellæ. Occurs in the palæozoic strata of Shropshire, Devon, and the Eifel.

CYSTO'PTERIS, a genus of ferns belonging to the tribe *Aspidieæ*. *C. fragilis*, Brittle Fern, is a remarkable variable species of fern, common in Great Britain, and found on rocks and walls, especially in limestone districts. They are of a diminutive size, and of a remarkably brittle nature, from which circumstance they have obtained their common name.

CYTINACEÆ, a small natural order of Rhizanths, the type of which is *Cytinus hypocistis*, a parasite found growing on the roots of certain kinds of Cistus in the south of France. The inspissated juice of the fruit is used in French pharmacy as a styptic, but it is not admitted with us. Along with this genus are associated the curious genus *Hydnora*, Cape of Good Hope, which looks like a great star of the Lycoperdon; *Apodenthus*, a minute parasite upon the branches of trees; and two other less known genera.

CY'TISUS, a genus of hardy papilionaceous shrubs, natives almost exclusively of Europe and the temperate parts of Asia, bearing ternate leaves, and with one exception, *C. purpureus*, yellow flowers. The species are common ornaments of our gardens. The most remarkable are the two kinds of Laburnum, *C. laburnum* and *C. alpinus*. These two plants form small well-known trees, which in spring are loaded with their numerous bunches of yellow flowers. They have a handsome hard olive-green wood, well adapted for the purposes of the turner. Both are natives of the Alps of Europe, and are much alike; but *C. alpinus* has the broader and more shining leaves of the two, and is much the handsomer plant. It is not a little singular, that the seeds of these species, in an order of plants usually wholesome, are decidedly and dangerously poisonous, owing to the presence of the deleterious alkaline principle called Cytisine. The *Cytisus* of Virgil was the *Medicago arborea* of botanists.

CY'TISUS SCOPA'RIUS, or *Broom*, a shrub extremely common on uncultivated ground, heaths, &c., of most parts of Britain. The young tops or twigs, when bruised, have an unpleasant odour, and a disagreeable nauseous taste. The seeds are emetic, and probably contain cytisine, an alkaloid found in the seeds of the Cytisus laburnum.

CYTOBLAST. In the development of the tissues of plants from the *Blastema*, or *Cyto-blastema*, which is a fluid consisting of water holding in solution sugar, gum, dextrine, &c., some of the granules assume a definite form, and become darker than the surrounding granules. These dark spots may be seen in the fluids of the growing parts of all plants. It is to these that Schleiden has given the name of Cytoblasts. The cytoblast produces from its surface a cell: when the cell has become fully grown, other cytoblasts are produced in its interior, which, by producing other cells, burst the parent cell and increase the substance of the part in which they are found. [TISSUES, VEGETABLE.] A growing point of the same nature has been observed in the tissues of the animal kingdom, and it has been thus demonstrated that in the original growth of their tissues there is an identity between the animal and vegetable kingdom.

CY'ZICUS, an ancient town of Asia Minor, built on an island in the Propontis near the coast of Mysia, which was joined to the main land by two bridges. An isthmus has gradually formed, and the island is now a peninsula. Cyzicus was one of the first cities of Asia for splendour and extent. It became early allied to Rome, and remained faithful in its alliance. The town of Cyzicus was built partly on the sea-coast, and partly on a hill; its site has been described by Pococke, Sestini, and Hamilton (ii. 100); there are some remains, and among them an amphitheatre.

CZAR, or TZAR, the Russian title of the monarch of Russia. Some have supposed it to be derived from Cæsar or Kaisar; but the Russians distinguish between Czar and Kesar, which last they use for emperor. The sovereign of Russia styles himself also Autocrat of all the Russias. It is only since the time of Peter the Great that the title of Emperor has been given to him by the senate, and afterwards by the other courts of Europe. The consort of the Czar is styled Czarina.

CZASLAU. [BOHEMIA.]

CZECHES. [BOHEMIA.]

CZEGLED. [HUNGARY.]

CZERNIGOF, or TSCHERNIGOV, formerly part of the Ukraine, is at present one of the three

governments of Little Russia. It lies between 50° 20′ and 53° 15′ N. lat., 30° 18′ and 34° 47′ E. long. It is bounded N.W., N., and N.E. by Moghilef, Smolensk, and Orel, or Orlov; E. by Kursk; S.E. and S. by Pultava and Kiev; and W. by Minsk. Its area amounts to 21,057 square miles, and the population in 1846 was 1,430,000. The surface is mostly level and fertile, except towards the Dnieper, which forms the south-west boundary of the government, and here there is some high land; the whole country presents a succession of luxuriant arable land and rich pastures. Tschernigov belongs to the basin of the Dnieper, and is drained chiefly by the Desna, a navigable river, which, rising in Smolensk, flows S. into the Orel, whence it traverses Tschernigov nearly in its whole length in a south-westerly direction, and enters the Dnieper *from* the left bank, a little above the town of Kiev. The waters of the Desna are increased by numerous feeders, among which are the Oster, Seim, and Sudost; the north-western part of the country is drained by the Besed and the Ipout, feeders of the Soj, which enters the Dnieper at the point where this river begins to form the western boundary. The climate is dry, mild, and salubrious. Agriculture and grazing constitute the principal pursuit of the inhabitants; the produce consists of corn of all kinds, of which the annual produce amounts to 3,000,000 imperial quarters, hemp, flax, tobacco, peas, beans, linseed and hops. Vegetables, melons, and the commoner sorts of fruit are plentiful, but the grape does not ripen sufficiently for wine. There is here a peculiarly fine species of the cherry, called Tsherasun, from which brandy and sugar are obtained. The woods and forests yield an abundance of excellent timber, charcoal, potash, and tar. Horses and cattle are reared in great numbers; the horse is of the small, active, and hardy breed of the Ukraine, and well adapted for the use of light cavalry. The oxen, which are numerous and of a very fine breed, are used exclusively in the plough. Large herds of sheep and swine are kept. Much honey and wax are made. Of minerals, Czernigof possesses iron, alum, salt-petre, porcelain earth, potter's clay, chalk, and slate. Free cultivators are common in this and in other parts of Little Russia.

The inhabitants mostly make their own clothing and utensils. There are however some important manufactories of various woven goods, and a great number of distilleries. The internal trade mostly centres at Neschin, where four large fairs are held yearly. The exports consist of horses, cattle, swine, tallow, wool, skins, bristles, *corn*, meal, honey, wax, potash, hemp, and spirits.

The country is divided into 14 circles. The chief towns are — Czernigov: Neschin, on the Oster, which has 15 churches, and 16,000 inhabitants, who carry on a large trade: Gluchof, on the Irsmen, which has 12 churches, and 9000 inhabitants: Novgorod-Seversk, on the Desna, which has a population of 8000: Starodub, on the road from Smolensk to Novgorod-Seversk, population, 4500: Mglin, in the north of the government, and on the road before mentioned, has 4 churches, and 5000 inhabitants: Oster, at the confluence of the Oster and the Desna, which has a population of 4000: and Baturin, on the left bank of the Seim, formerly the residence of the Hetman of the Cossacks, which has 5000 inhabitants. This last town, which was built by Stephen Bathory, king of Poland, was burnt by the Russians, in revenge for the treachery of Mazeppa, but was afterwards rebuilt.

CZERNIGOF, the capital of the government, is situated on the Desna, in 51° 27′ N. lat., 31° 15′ E. long., and has 10,000 inhabitants. It is surrounded by a rampart of earth which is now converted into walks. In its centre stands a high hill with a castle on its summit; it has several churches, among which is the cathedral of St. Theodosius, 4 monasteries, a gymnasium, an ecclesiastical seminary, an imperial orphan asylum, and several charitable establishments. The manufactures consist of woollens, linens, leather, and soap. The town is the residence of an archbishop.

CZERNOVITZ or CZERNOVICS, a circle in Austrian Galizia, is more commonly called 'the Buckowine,' being that portion of Moldavia which the Porte ceded to Austria in 1777. The Moldau borders it on the south and east, and Transylvania on the south-west. Its surface, which comprises an area of about 3100 square miles, is intersected in all parts by well-wooded branches of the great Carpathian range. The intervals between the lines of mountains are broad and productive valleys, fertilised by the Pruth, Sereth, Moldau, Czeremosh, Suczava, Golden Bistriza, &c., and yield rich crops of corn, flax and hemp, potatoes, and fruit. Grazing is also carried on upon an extensive scale. The Buckowine has rich salt-springs. Gold-dust is found in the sands of the Bistriza; silver, lead, copper, and iron are obtained from the mines near Kirlibaba. There are glass-works, several potash manufactories, and brandy distilleries, in the circle. The population amounts to 290,000. The three chief towns are—Czernovitz, the capital, which stands on a hill on the right bank of the Pruth, and has 7000 inhabitants; it is the seat of a Greek bishop and a Greek consistory, has several churches, one of which is a Greek cathedral, a college, and a considerable trade with Germany, Moldavia, and Wallachia: Suczava, a frontier town on the right bank of the river Suczava, which has 4 churches, a synagogue, and about 5000 inhabitants: and Sereth, also a frontier town on the right bank of the river Sereth, which has 3 churches, and about 3100 inhabitants.

CZIRKNITZ, or ZIRKNITZ. [Illyria.]

CZORTKOV. [Galizia.]

D, which occupies the fourth place in the Hebrew alphabet and those derived from it, is the medial letter of the order of dentals, or palato-dentals. It readily interchanges with those of the same organs. The German language and the English offer an abundance of examples.

1. *D* in German corresponds to *th* in English, as *dein*, thine; *denk-en*, think; *du*, thou; *bruder*, brother; *erde*, earth; *leder*, leather, &c. And, on the other hand, *th* in German, which however is not pronounced as among us, corresponds to *d* in English, as *thau*, dew; *that*, deed; *theil*, dole and deal; *roth*, red; *noth*, need.

2. *T* in German to *d* in English, as *tag*, day; *taub*, deaf; *wort*, word; *bart*, beard.

3. *D* in Latin to *z* or *ss*, or *s* final in German, and *t* in English, as *decem*, *zehen* or *zehn*, ten; *duo*, *zwey*, two; *dens* (*dent*), *zahn*, tooth; *cor* (*cord-is*,) *herz*, heart; *sud-or*, *schweiss*, sweat; *pes* (*ped-is*, *fuss*, foot; *ed-ere*, *ess-en*, eat; *quod*, *was*, what; *id*, *es*, it.

4. *D* is interchangeable with *l*. Compare the Greek forms Ὀδυσσευς, Πολυδευκης, δακρυω, with the Latin *Ulixis*, *Pollux*. *Vesidia* and *Digentia*, two small streams of ancient Italy, are now called respectively *Versiglia* and *Licenza*. So the Italians say either *edera* or *ellera* for ivy; and the Latin *cauda*, a tail, is in Italian *coda*, in Spanish *cola*. While the Greek has δικα for ten, the Lithuanian prefers *lika*; and, of two Sanscrit dialects, one has *dasan*, the other *lasan*, for the same numeral.

5. *D* attaches itself to the letter *n*. Thus we find Gr. τειν-ω, and Lat. *tend-o*, stretch; Lat. *canis*, Eng. *hound*; Lat. *sonus*, Eng. *sound*; Ger. *donner*, Eng. *thunder*; Ger. *niemand*, Eng. *no-man*. And our English term *husband* is a corruption of *house-man* (Lat. dominus). This *d* is particularly apt to insert itself after an *n* when an *r* follows. Thus, from the Latin *ciner-is*, *gener*, *tener*, come the French *cendre*, *gendre*, *tendre*.

6. *Di* before a vowel is changed into a *g* or *j*, as *Dianus* or *Janus*, the god of light (dies) in Roman mythology; *Diana* or *Jana*, the goddess of light. So *Diespiter* and *Jupiter* are the same name. The Latin *hodie* is in Italian *oggi*.

7. *Du* before a vowel is changed into *b* or *v*. [B.] With this principle is connected the change of *d* into *v*, in the words, *suavis*, *suadeo*, and ἀδυς, *clavis* and *claudo*, and the river *Suevus* or *Oder*.

8. Instances occur where *d* is interchanged with both the other medials; with *b*, as in Latin *barba*, *verbum*, English *beard*, *word*; with *g*, as in the Greek Δημητηρ from γη-μητηρ, κηδες, 'the beech,' as well as φηγος, and in the two names of the African city, Καρχηδων and *Carthago*.

9. *D*, when flanked by vowels, often disappears in the transition of words from Latin into French. Compare *Melodunum*, *Ludovicus*, *vadum*, *fides*, *nudus*, *cauda*, *assidere*, *videre*, with *Melun*, *Louis*, *gué*, *foi*, *nu*, *queue*, *asseoir*, *voir*.

D (in Music). [Diatonic; Gamut; Scale.]

DABCHICK. [Divers.]

DA CAPO, or D.C., an Italian musical term, signifying that the first part, or strain, is to be repeated, and to conclude at the sign of the pause (𝄐), or at the word *fine*.

DABŒCIA, a genus of plants belonging to the natural order *Ericaceæ*. There is but one species, the *D. polyfolia*, which is a dwarf bushy evergreen shrub, a native of Ireland and the Pyrenees. It is a pretty shrub, and well fitted for decorating the fronts of shrubberies or for rock-work.

DACCA, a city of Hindustan, capital of the district of Dacca, is situated on a branch of the Ganges, called the Booree Gunga (Old Ganges), about 100 miles above the mouth of the river, in 23° 43′ N. lat., and 90° 28′ E. long. Dacca is comparatively a modern town. In 1608 the seat of government was removed to it by Islam Khan, then governor of Bengal under the Mogul emperor, Shah Jehanghire. Dacca was formerly a much more extensive place than it is now. The former limits of the city contain the ruins of many splendid buildings; the castle of Shah Jehanghire, a fine mosque built by him, palaces of the former nawâbs, Mohammedan mosques, Hindoo pagodas, and European churches; but almost all in ruins, and overgrown with jungle. Including the suburbs, the town occupies a space 6 miles long, on the bank of the river, but it is not wide in proportion. The streets are narrow and crooked, and the houses, for the most part, are mean buildings. There are still about 90,000 houses and huts, and the population is probably not less than 300,000. The river on which Dacca stands was, when Rennell made his map, comparatively narrow, but is now, even in the dry season, not much less than the Hoogley at Calcutta. The surrounding country is all flat, and is flooded in the wet season. Rice is cultivated to a very great extent. (Rennell's *Map of Hindustan*; Heber's *Journey through the Upper Provinces of India in* 1824 5.)

DACE. [Leuciscus.]

DA CIA, the ancient name of a country north of the Danube, and south of Sarmatia, bounded on the east by the Pontus Euxinus, and on the west by the Tibiscus, now the Theiss. It was divided into Dacia Ripensis, Dacia Alpensis, and Dacia Mediterranea. The ancient Dacia comprehended the modern Transylvania, Wallachia, Moldavia, and Bessarabia. The country was in-

habited by the Daci and the Getæ. The principal river of Dacia is the Tibiscus, which, with its tributary the Mariscus, falls into the Danube. The first expedition of the Emperor Trajan was against the Daci, headed by their king, Decebalus; and the war, which lasted nearly five years, ended in their submission to the Roman power. In A.D. 250 Dacia was overrun and conquered by the Goths, to whom it was afterwards resigned by the Emperor Aurelian.

DACIE'R, ANDRE', was born at Castres, in 1651, studied at Saumur, under Tanneguy le Fèvre, whose daughter Anne he married in 1683. Both husband and wife were eminent as classical scholars. They were employed with others to comment upon and edit a series of the ancient authors for the Dauphin, which form the collection 'Ad usum Delphini.' Madame Dacier edited Callimachus, Florus, Aurelius Victor, Eutropius, and the history which goes by the name of 'Dictys Cretensis,' all of which have been repeatedly reprinted with her notes. She published French translations of the 'Amphitryon,' 'Rudens,' and 'Lepidicus' of Plautus, with a good preface; of the comedies of Terence; of the 'Plutus' and the 'Clouds' of Aristophanes; and of Anacreon and Sappho. She also translated the 'Iliad' and the 'Odyssey,' with a preface and notes. Madame Dacier's pursuits did not make her neglect her duties as a wife and mother; and she was charitable towards the poor. She died in 1720, and her husband in 1722. Monsieur Dacier, besides his editions of the classics, translated into French the works of Hippocrates, the 'Œdipus' and 'Electra' of Sophocles, the 'Poetica' of Aristotle, and the 'Lives' of Plutarch; he also translated Horace, but neither the translation nor the notes are much esteemed. Dacier was a member of the Academy of Inscriptions, secretary to the French Academy, and keeper of the Cabinet of the Louvre, and he had a pension of 2000 francs from Louis XIV.

DACNIS. Cuvier's name for a genus of birds (the Pitpits of Buffon), which, he observes, represent the *Carouges* (*Xanthornus*) in miniature, by their conical and sharp bill.—Example, *Dacnis cyanea*. Colour, cærulean blue; forehead, shoulders, wings, and tail, black.—Locality, Mexico. This pretty bird is the Eltototl of the Mexicans. Hernandez says that it lives about the trees of the Tetzcocan Mountains, and that it is eatable. It does not sing, and therefore is not kept in the houses of the inhabitants.

DACTYL is the name of a metrical foot consisting of a long and two short syllables, as the Latin word *ōmnĭă*; or of an accented syllable followed by two unaccented, as *gállery*.

DACTY'LICS. To this term belong all those metres which consist of a repetition of dactyls or equivalent feet. The long syllable may be the first in the line, as it is in the heroic verse of Homer; or it may be preceded by one or two short syllables. Thus the modern anapestic verse is strictly a dactylic metre, as—

'If he ha'd any fau'lts, he has lo'ft us in dou'bt.'

Of the dactylic metres the most common are the hexameter, which, as its name implies, consists of six feet, and the pentameter, of five feet.

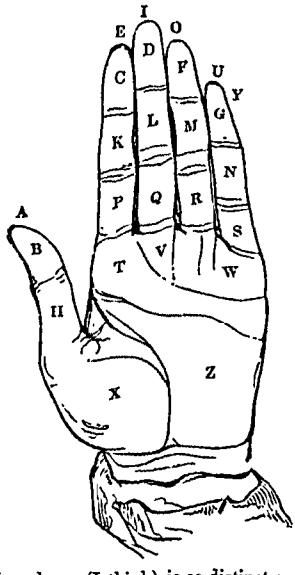
The dactylic metre often alternates with trochaic measures. Such is the case in the Sapphic and Alcaic stanzas.

DA'CTYLIS GLOMERA'TA, or Cocksfoot Grass, is an extremely common plant in fields and waste places, growing and flowering during a great part of the summer. It has, in its wild state, a coarse blueish rough herbage, and a flower-stem about three feet high. In its uncultivated state this is a coarse hard grass; nevertheless, it is readily eaten by cattle, horses, and sheep: it strikes its roots to a considerable depth in the soil, and on this account is capable of enduring the drought of dry, sandy, exposed land. Hence, in such situations, where scarcely any other pasture can be procured, it is of great value.

DACTYLO'LOGY, the art of communicating ideas by spelling words with the fingers. The positions which the fingers are made to assume correspond to the alphabetic characters of a language, and the series of alphabetic signs is perhaps better known under the name of the *manual alphabet*. The chief and the most useful application of dactylology is in the instruction of the deaf and dumb. In the various institutions for this class of persons, dactylology is almost universally employed. The letters may be formed by the two hands, or with only one hand: a two-handed alphabet is used in the English institutions; on the continent of Europe, and in America, the one-handed alphabet is employed. Both these alphabets are represented in vol. ii. p. 500, of the 'Penny Magazine.' By reference to these engravings, it will be seen that either of them may be learned by an hour's practice; they are often taught to the deaf and dumb, in conjunction with the written alphabet, in a few days.

The manual alphabet has been employed as a medium of intercourse between the deaf and dumb, and blind persons; it is also commonly used by the former when they have to converse in the dark. As the art addresses itself to the sense of touch, as well as to that of sight, it is easy to touch another person's hands, who is acquainted with the hand-alphabet, in such parts or positions as to enable him to read the words or sentences thus conveyed.

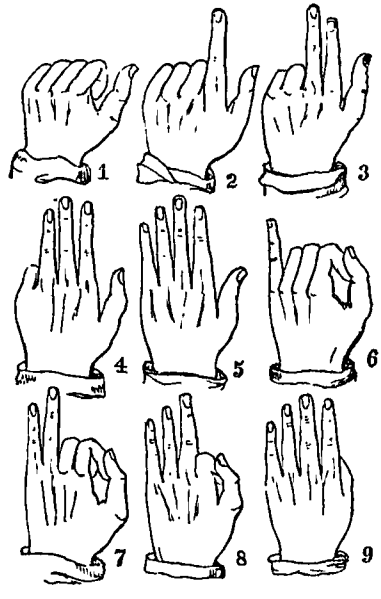
Perhaps the first manual alphabet which was published in England was that of Dalgarno, the most intelligent author on the subject of the instruction of the deaf and dumb next to Bulwer; he published it in 1680. As few copies of his work are now to be met with, we shall give his hand-alphabet, and accompany it by as much of his own explanation as seems necessary for understanding his views on dactylology. 'After much search and many changes, I have at last fixed upon a finger or hand-alphabet according to my mind; for I think it cannot be considerably mended, either by myself or any other (without making tinker's work), for the purposes for which I have intended it; that is, a distinct placing of and easy pointing to the single letters; with the like distinct and easy abbreviation of double and triple consonants.'



'The scheme (I think) is so distinct and plain in itself, that it needs not much explication, at least for the single letters, which are as distinct by their places as the middle and two extremes of a right line can make them. The rules of practice are two. 1. *Touch the places of the vowels with a cross touch with any finger of the right hand.* 2. *Point to the consonants with the thumb of the right hand.* This is all that I think to be needful for explaining the scheme, so far as concerns the single letters.'

This was probably the finger-alphabet from which our present two-handed one was derived; some similarities may be traced in them, particularly in the places for the vowels. The one-handed alphabet was invented in Spain, and appears to have been first published in Bonet's work. [Bonet.] A dactylology of syllables has been sometimes employed in the instruction of the deaf and dumb. A system of alphabetic and syllabic dactylology was also published by Dr. Deleau the younger, in 1830.

There remains to be noticed another application of finger-language, which, in the instruction of the deaf and dumb, is next in importance to alphabetic signs; it is in the designation of numbers, and in the employment of the fingers in the first rules of arithmetic. The only system of manual notation which deserves that name is the one which we shall now describe. It is used in several of the American and English institutions for the deaf and dumb, and was invented by Mr. O. Stansbury, a former superintendent of the New York Institution. One hand only, the left, is used, and the pupil's right hand is thus left at liberty to record his calculations upon his slate. The nine digits are represented one after another by elevating the fingers of the hand successively, thus:—

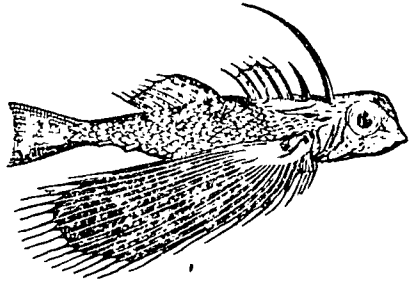


The cipher is represented by the closed hand.

The thumb represents *one*, the other fingers being closed, the index-finger is added for *two*, the middle finger is raised for *three*, the ring-finger is added for *four*, and the open hand represents *five;* the little finger alone is raised for *six*, the ring-finger is added for *seven*, the middle finger for *eight*, and the fore-finger is raised to the others for *nine*. Thus far for units. To indicate tens, the position of the hand is changed from perpendicular to horizontal; the thumb is pointed forwards for ten, the thumb and fore-finger for twenty, and so on to ninety. Hundreds are pointed downwards; thus the thumb, fore-finger, and middle finger pointed downwards represent 300. If 572 be the number to be designated, three positions of the hand are required; the five fingers are pointed downwards for 500, the little finger and ring-finger are pointed forwards for 70, and the thumb and fore-finger are held upright for two. During these changes the hand is kept in front of the body. To represent thousands, the left hand is placed across the body towards the right shoulder, and the signs which were used in front for units, in this situation, represent thousands; keeping

the hand in the same situation and pointing forwards or downwards, tens of thousands or hundreds of thousands are exhibited. By changing the situation of the hand to the left shoulder, and by exhibiting the various positions of the fingers before described, millions, tens of millions, and hundreds of millions are expressed. The same positions, upright, forwards, and downwards, exhibited in other situations, may be applied to the expression of notations to any extent. Though rather complex in description, the whole is most easy and comprehensive in operation.

DACTYLO'PTERUS, a genus of fishes, allied to the Gurnards (*Trigla*), of the order *Acanthopterygii* and family *Loricati*. These fishes are remarkable for the immense fan-like extent of their pectoral fins, which, acting as parachutes, enable them to sustain themselves in the air, when they spring from the water in order to escape the pursuit of Bonitoes and other voracious fishes. Hence they are called Flying-Fish or Flying Gurnards; but they must not be confounded with other Flying-Fish of the genus *Exocetus* (*Malacopterygii Abdominales*), which possess the same powers. Voyagers in their accounts make little distinction between them. One species is common in the Mediterranean (*D. volitans*), as is also *Exocetus exiliens*; another species inhabits the seas of the warmer latitudes (*D. orientalis*), as does also *Exocetus volitans*. (Cuvier, vol. ii.)



Dactylopterus orientalis.

DADO, a term for the die or plane face of a pedestal. The dado employed in the interiors of buildings is a continuous pedestal, with a plinth and base-moulding and a cornice or dado-moulding surmounting the die. This continuous pedestal, with its moulding, is constructed of wood, and is usually about the height of a chair-back, and is now used to protect the stucco-work or paper of the wall. Some dados are pannelled.

DÆDALUS. [Sculpture.]

DAFFODIL. [Amaryllideæ; Narcissus.]

DAGHESTAN. [Georgia.]

DAGOBE'RT I., son of Clotarius II., succeeded him, in 628, in the Frankish monarchy. Dagobert sustained wars against the Saxons from England, the Vascones of the Pyrenees, the Sclavonians, and the Bretons. He published the laws of the Franks; he encouraged commerce, and opened negotiations for that purpose with the Byzantine emperors; and he made Paris his permanent residence. Dagobert died in 638, in his thirty-sixth year, and left two sons, Siegbert II., who succeeded him in Austrasia, and Clovis II., who became king of Burgundy and Neustria.

DAGOBERT II., son of Siegbert II., king of Austrasia, after his father's death, in 656, was first shut up in a convent, and afterwards sent to Scotland. Here he married Matilda, a Scottish princess, and after many years returned, and was acknowledged king of Austrasia. He was murdered in 679, and Pepin d'Héristal succeeded Dagobert in Austrasia, not as king, but with the title of duke.

DAGOBERT III. succeeded his father Childebert III., as king of the Franks, in 711. Pepin d'Héristal continued to enjoy the whole authority, but died in 714, and Rainfroy succeeded as maire of the palace. In 715 Dagobert died, leaving a child (Thierri IV.), who was set up as a nominal king by Charles Martel, the natural son of Pepin d'Héristal.

DAGOE. [Esthonia.]

DAHL, MICHAEL, a Swedish portrait-painter, who was the principal rival, in England, of Sir Godfrey Kneller. He was born at Stockholm in 1656, was taught painting by Ernstmon Klocke, and came to England first in 1678. He went afterwards to France and Italy, and in 1688 returned to England, and soon acquired a good practice.

Walpole mentions, among other works by Dahl, a portrait of his mother, at Houghton, which he says possessed great grace. There is an equestrian portrait by Dahl, at Windsor, of Charles XI. of Sweden; and there are several portraits of admirals in the gallery at Hampton Court, and some whole-lengths of ladies at Petworth.

Dahl died in London, in 1743, and was buried in St. James's Church, Piccadilly.

DA'HLIA, a small genus of composite flowers, of which three species only are known, all natives of Mexico. Of these, two, *D. coccinea* and *D. Cervantesii*, were formerly cultivated in this country; but not sporting into varieties, and being much less beautiful than *D. variabilis*, they are not now seen in gardens. *D. variabilis* itself is, in its wild state, a bushy, herbaceous plant, 7 or 8 feet high, with single purple or lilac flowers, and is by no means remarkable for its beauty. In cultivation however it is so readily improved in size and form, and sports into such endless varieties in stature, leaves, and flowers, that it has become the most extensively cultivated florist's plant of the present day. Its innumerable sorts are the glory of our gardens in the autumn, and are quite unrivalled at that season of the year: they are however destroyed by the earliest frosts. Each season produces its favourite varieties, and these are in their turn eclipsed by others of a newer or a choicer form.

DAHOMEY, a kingdom of western Africa, is bounded W. by Ashantee, from which it is divided by the Adiri or Volta, E. by Yarriba, and S. by several small states along the Bight of Benin; its northern boundary is not known; but it is supposed to extend to the range of the Kong Mountains. Its capital, Abomey, is placed in

7° 59′ N. lat., and in about 3° 20′ E. long. The existence of this kingdom was first made known to Europeans by the invasion and subjugation by King Trudo of the white settlements on the coast. This king mounted the throne in 1708, and from that time till 1803 Dahomey seems to have been a powerful state; but, when Clapperton and the Landers visited it (1826, 1827), the country was reduced to subjection by the neighbouring state of Yarriba.

The kingdom of Dahomey is situated in a vast plain rising by a very gentle ascent from the sea. No river worth notice falls into the sea between the Volta and the Niger. The soil is a rich reddish clay, on which scarcely a stone is to be found of the bigness of a walnut. All who have visited the coast, especially before the devastations of the Dahomans, describe it as a scene of matchless beauty and luxuriance. Its productions comprise maize and other farinaceous crops; yams, potatoes, pine-apples, melons, oranges, limes, guavas, and other tropical fruits; indigo, cotton, sugar, tobacco, palm oil, spices, &c. The country abounds with tigers, leopards, hyænas, elephants, buffaloes, deer, sheep, goats, hogs, both wild and tame, and several varieties of poultry. It is infested by boa-constrictors and other serpents. The government of Dahomey is, or at least formerly was, an absolute despotism; and authority is maintained by the shedding of blood at a rate which has been approached nowhere but in Africa. The customs or festivities held at the court of the monarch, on occasion of the annual receipt of duties or tribute, are of the same ferociously sanguinary character with those that take place at Ashantee. The chief ornament of the royal residence is human skulls, of which, when a number was wanted to pave a court or decorate a ceiling, it was not an unusual process to have some scores of persons massacred for the purpose. The chief towns are—Abomey the capital, which is irregularly built, surrounded by a deep ditch with four bridges across it; the population amounts to 24,000; and Calmina, S. of Abomey, which contains a large royal residence, and 15,000 inhabitants. It must be stated that but little is known of the present condition of this country; the principal events in its history will be found in Smith's 'New Voyage to Guinea,' London, 1745; Snelgrave's 'Full Account of some part of Guinea,' London, 1734; Norris's 'Memoirs of Bossa Ahadee,' published in 1780; Dalzel's 'History of Dahomey,' London, 1793; M'Leod's 'Voyage to Africa;' and the notices of more recent travellers.

DAILLÉ, JEAN, was born at Chatelheraut in 1594, of a Protestant family. In 1612 he undertook the education of the two grandsons of Duplessis Mornay, and travelled with them in several countries of Europe. At Venice he became acquainted with the famous Fra Paolo Sarpi. On his return to France he became pastor at Charenton in 1626. He published many works on divinity, both in Latin and French, and especially on controversial subjects. He was one of the most learned and most powerful advocates of the Protestant doctrines in his time. One of his principal productions was 'De Sacramentali sive Auriculari Latinorum Confessione,' Geneva, 1661. This last work puts forth the strongest arguments against the practice of auricular or private confession. He also wrote an apology of the reformed churches, and numerous sermons, which have been collected in several volumes. Daillé died at Paris in 1670.

DAIRY, the name usually given to the place where the milk of cows is kept and converted into butter or cheese. The occupation is called *dairying;* and land which is chiefly appropriated to feed cows for this purpose is called a *dairy-farm.*

A dairy-house should be situated on a dry spot somewhat elevated, on the side of a gentle declivity, and on a porous soil. It should be on the west or north-west side of a hill if possible, or at least sheltered from the north, east, and south, by high trees. Coolness in summer, and an equable temperature in winter, are essential requisites in a dairy.

As the milk suffers more or less from being agitated, or too much cooled, before it is set for the cream to rise, the cow-house or milking-place should be as near as possible to the dairy, or rather it should be under the same roof. The dairy-house should consist of three distinct apartments below, with lofts and cheese-chambers above. The principal place is the dairy, properly so called, sunk two or three feet below the level of the ground, with a stone or brick bench or table round three sides of it to hold the milk pans. Air holes with sliding shutters should be provided in the walls. The floor should be of stone or paving tiles, sloping gently towards a drain to carry off the water. The windows should be latticed, or made like Venetian blinds. The next important place, the wash-house, should have a chimney and a large copper kettle hanging on a crane. In this place all the utensils of the dairy are kept, and scalded with boiling water every day. Between the last two apartments may be another communicating with both, and forming a kind of vestibule, where the churning may take place; and over them a cheese-room and lofts, or any other useful chambers. A verandah round the dairy is very convenient, or on three sides at least.

The following description of a Netherland cow-house and dairy under one roof combines all that is useful, with considerable neatness internally and externally:—It is a building about sixty feet long by thirty wide, with a verandah running round three sides of it. The dairy-room is sunk below the level of the soil, and is paved with brick. The sides are covered with Dutch tiles, and the arched roof with hard cement. The cow-house, like all in Holland, has a broad passage in the middle, and the cows stand with their heads towards this passage, which is paved with clinkers or bricks set on edge. Their tails are towards the wall, along which runs a broad gutter sunk six or eight inches below the level of the place on which the cows stand. The cows stand or lie on a sloping brick floor, and have but a small quantity of litter allowed them, which is removed every day and carried to the dung-heap or to the pigsties. Whenever the litter is removed, the bricks are swept clean; and in summer they are washed

with water. In Holland the cows' tails are kept up by a cord tied to the end of them, which passes over a pulley with a weight at the other end, as we see practised with horses that have been nicked: thus they cannot hit themselves, or the person who milks them. The cows are fastened in a way so as to give them freedom of movement without striking their neighbours with their horns. The mangers or troughs are of wood, or of bricks cemented together, and are kept as clean as all the rest of the cow-house. In Switzerland the cow-houses are similar, but there is also a rack, the back of which towards the passage shuts up with a board on hinges. The food is brought in carts, which are driven at once between the cows. What is not wanted immediately is stored above, whence it is readily thrown down before the cows. From November till May the cows never leave the cow-house. In summer, when the cows are out, if they are in adjacent pastures, they are driven home to be milked; but, if the pastures are far off, they are milked there, and the milk is brought home.

The utensils of the dairy, such as pails, churns, vats, &c., are usually made of white wood, and are easily kept clean by scalding and scouring. Leaden troughs are used in large dairies. Brass pans have the advantage of being readily warmed on a chafing-dish in winter. In Devonshire tin or brass pans are frequently used instead of earthenware. In Holland the milk is invariably carried in brass vessels. Cast-iron pans have been invented, which are tinned inside. Glass and white ware are used for the same purpose.

The most common use of cows is to supply butter and cheese [BUTTER; CHEESE], and sometimes to fatten calves [CALF] for the butcher; but the most profitable dairy is that which supplies large towns with milk. In these dairies the system is different. The cows are mostly kept in stalls, and fed with food brought to them. The women who purchase the milk from the dairyman, and carry it about for sale, come for it to the dairy, and milk the cows twice a day. The cows are fed on every kind of food that can increase the milk; brewers' grains and distillers' wash are preferred, when they can be obtained. Turnips and beet-root are used in large quantities; but hay is given sparingly. The great dairies about London are kept very clean; but the liquid manure, which would be so valuable for the market-gardens, is lost, and runs off by the sewers.

The dairy farms of England are chiefly in Gloucestershire, Devonshire, and Cheshire. They require a smaller capital than arable farms of the same extent. The chief outlay is the purchase of cows. The rent of good grass-land is generally higher than if it were converted into arable land; and the risk from seasons, and from a variation in the price of the produce, is much less in a dairy-farm than in one where corn is chiefly cultivated. Hence the rents are better paid, and there are fewer failures among the tenants, but the profits of a dairy-farm, without any arable land, are not considerable. A decent livelihood for the farmer and his family is all that can be expected.

DAIS or DEIS, a word which occurs very frequently in old English authors. It originally signified the wooden floor which was laid at the upper end of the hall, as we still see it in college-halls, in those of the city companies in London, and those belonging to the inns of court. As the principal table was always placed *upon a deis*, it began, by a natural abuse of words, to be called itself a deis, and people were said to sit *at the deis* instead of *at the table upon the deis*.

DAISY. [BELLIS.]

DALAGOA or DELAGOA BAY, on the eastern coast of Southern Africa, is a large bight, extending about 22 miles from N. to S., and 20 from E. to W.; but the channel, on account of the shoals on both sides, is not more than 5 miles wide. The north-east point of St. Mary's Island, the eastern entrance of the bay, is in 25° 58′ S. lat., 33° 15′ E. long. Three important rivers, the Manica, Delagoa, and Machavanna, enter the bay, and are navigable for a considerable distance. The Delagoa has 15 feet water on the bar at low tide, is navigable for vessels of 12 feet draught upwards of 40 miles, and for large boats about 200 miles inland. It is much frequented by whalers, as the bay abounds in whales. The Portuguese have a small fort on the western shore of the bay. Supplies are abundant and cheap; piece-goods, buttons, beads, cutlery, brass wire, old clothes, iron, copper, pipes, spirits, sugar, &c. are readily taken for bullocks, fowls, vegetables, fish, hippopotami teeth, gold dust, ambergris, &c. Near the shores of the bay the country is low, marshy, and in summer unhealthy: but at no great distance it is high, healthful, and well cultivated. [CAFFRARIA.] (*London Geographical Journal*, iii.; Macgregor's *Statistics*.)

DALAI LAMA. [LAMA.]

DALBY, ISAAC, one of the many self-taught men of this country who have attained considerable eminence in mathematical science by the mere force of genius, and in defiance of the obstacles opposed by fortune to their progress, was born in Gloucestershire, in the year 1744. His taste leading him to the study of mathematics, he qualified himself to become an usher in a school. He afterwards opened a school on his own account in the country, but, meeting with no success, he came to London in 1772. Here he was engaged to teach arithmetic in Archbishop Tenison's Grammar School, near Charing Cross; and while fulfilling the duties of that employment, his name having already appeared in some of the magazines of that time, particularly the 'Ladies' Diary,' among the correspondents who occasionally answered mathematical questions, he became known to many of the most celebrated men of science in town. After having been about a year at that school, Dalby was employed to make astronomical observations in a building erected near Highgate by the Hon. Topham Beauclerk, and while in this situation he made himself acquainted with the French language. In 1782 he was appointed mathematical master of the naval school at Chelsea. This was supported by voluntary contributions; but, the subscriptions falling off, it was given up.

In 1787 Mr. Ramsden, the distinguished maker of mathematical instruments, to whom for several years Dalby had been known, recommended him as an assistant to Major-General Roy, who was then employed in the trigonometrical operations for connecting the meridians of Greenwich and Paris; and during that and the following year he was employed in extending the triangulation through Kent and part of Sussex to the coast opposite France. Dalby was subsequently employed in making the computations preparatory to the publication of the account of the proceedings; and on this occasion he was led to apply a theroem (ascribed to Albert Gerard) to the purpose of computing the excess of the three angles of a spherical triangle above two right angles. The account was published in the 'Philosophical Transactions' for 1790. In that year General Roy died, and in 1791 Dalby was engaged, together with Colonel Williams and Captain (since Major-General) Mudge, to carry on the survey of England. [TRIGONOMETRICAL SURVEY.]

In the year 1799, on the formation of the Royal Military College at High Wycombe, Dalby was appointed professor of mathematics in the senior department of that institution. At this time he was more than fifty years of age, and desirous of securing a retreat from the fatigues of the field. He continued to hold that appointment during the years that the department to which he belonged remained at High Wycombe, and subsequently to its removal to Farnham, in Surrey; but in the year 1820, it being then united to the junior department at Sandhurst in Berkshire, his infirmities obliged him to resign. He continued however to reside at Farnham till his death, which took place October 14, 1824, when he was in the eighty-first year of his age.

His attention to his duties was unremitting; and besides his contributions to the 'Ladies' Diary,' and other works, he wrote, for the use of the Military College, a valuable Course of Mathematics, in two volumes, which, with successive improvements, extended to a sixth edition.

(Leybourn's *Mathematical Repository*, vol. v.)

DALECARLIA, properly DALARNE, a province of Sweden, extends from 60° 55′ to 62° 12′ N. lat., and from 12° 30′ to 16° 40′ E. long. Its area is 12,285 square miles, and its population 141,208. On the north it borders on Heriedalen, on the east on Gertrikland, on the south on Westmanland, Nerike, and Vermland, and on the west on Norway. The province lies entirely within the *Region of the Mines*, and constitutes the modern division of Falu Län. The chief town is FALUN; and the face of the country is described under SWEDEN.

D'ALEMBERT. [ALEMBERT, D'.]

DALGARNO, GEORGE, according to Anthony à Wood, was born at Old Aberdeen, in or before 1627, and educated in the University of New Aberdeen; taught a private grammar-school for about thirty years in Oxford; and died of a fever on August 28, 1687. Dalgarno was the author of two remarkable works, one 'Ars Signorum, Vulgo Character Universalis, et Lingua Philosophica,' London, 1661; and the other, 'Didascalocophus, or the Deaf and Dumb Man's Tutor.' In the first he preceded Bishop Wilkins by several years in his 'Essay towards a Real Character,' which moreover contains no mention of Dalgarno's work, though Dr. Wilkins had the advantage of seeing it before it went to press. This treatise, 'Ars Signorum,' &c., exhibits a classification of ideas, and a series of arbitrary signs or characters adapted to the classification, so as to represent each idea by a specific character, without reference to any language of words. All those persons who are acquainted with the Essay of Wilkins will see the germ of it in this design of Dalgarno's. The 'Didascalocophus' developes views on the instruction of the deaf and dumb both comprehensive and practical. It is a truly philosophical guide, by which the writer shows how capable the deaf and dumb are of understanding and applying a written language, and of their capacity to speak and to understand the speech of other persons. In the article DACTYLOLOGY a representation of Dalgarno's hand-alphabet is given. It is a gratification to find that his works are likely to be preserved, as they have been privately reprinted by Lord Cockburn and Mr. Thomas Maitland, and presented to the Maitland Club of Glasgow. Mr. Dugald Stewart has on more than one occasion paid a tribute of respect to Dalgarno.

DALKEITH. [EDINBURGHSHIRE.]

DALMATIA, a country which belonged to Venice till the treaty of Campo Formio in 1798, when it became a province of Austria with the title of *Kingdom*. It consists of a narrow maritime tract and several islands, along the eastern shore of the Adriatic, and lies between 42° and 45° N. lat., and 14° and 19° E. long. It is bounded N. by Hungary, E. by Turkey, and S. and W. by the Adriatic. It is not a compact territory, inasmuch as the circle of Ragusa is disjoined from the rest of Dalmatia by two tongues of land, which belong to Turkey. The area, inclusive of the islands, is 5168 square miles, and the population 396,028, the majority of whom are of the Sclavonian race. The whole surface of Dalmatia is covered with mountain-ranges, all of which are continuations of the Dinaric Alps. These mountains, which spring from Mont Kleck in the Julian Alps, run S.E. through Croatia and Dalmatia, covering both provinces with their numerous ramifications, and form the watershed between the Adriatic and the Save; they then run E. along the north of the Turkish province of Albania, and join the Balkan Mountains in about 23° E. long. The main range reaches its culminating point on the eastern boundary of Dalmatia, in Mount Dinara, which reaches the height of 8500 feet, and gives name to the whole mass. The Montenegrin heights encircle the Gulf of Cattaro, and terminate in Mount Dubovicza, the most southern point in the Austrian dominions. The general character of the Dalmatian mountains is bleak and bare: they are full of fissures, ravines, and chasms, and in many places altogether without soil. Limestone is the prevailing rock. The whole line of coast is barren and naked, except a narrow tract between the Adriatic and the base of the moun-

tains; the background is formed by a continued line of dreary precipitous heights, seldom less than 2500 feet in elevation. The coast-line, reckoning its numerous indentations, measures 300 miles, and presents many excellent harbours. The interior of the country is furrowed by glens and valleys, many of which are stony and sterile.

Few countries are so poorly supplied with water; the islands in particular suffer greatly in this respect. The Dalmatian rivers run into the Adriatic. Among the larger streams are the Zermagna, which falls into the Morlacca channel, near Novigrad: the Kerka, which forms several magnificent cascades, and flows into the Adriatic near Sebenico: the Cettina, which springs from the foot of Mount Dinara, and has two falls, one of which is from 90 to 100 feet high; the banks of this river are extremely wild and precipitous, until it reaches a fine valley near Amissa, where it enters the Adriatic. The Narenta, the broadest river in Dalmatia, enters it from Turkey, and, after watering it for about 10 miles, parts into two channels at Fort Opus, and reaches the Adriatic through ten arms. Dalmatia is full of lakes, most of which become dry in hot weather. It has also numerous mineral springs.

No part of the Austrian dominions is so hot as Dalmatia. In the lowlands the date-bearing palm, the American aloe, and the *Cactus opuntia* thrive in many districts in the open air. The almond blossoms in January. Among the mountains, where the snow sometimes continues till May and even till June, the climate is much bleaker. Near the coasts of Zara, the marshes of the Narenta, and elsewhere on the Adriatic, the climate is very unhealthy. Winter is characterised by six weeks of uninterrupted rain.

The arid character of the soil renders Dalmatia on the whole unsuited to agriculture. Turkey and Hungary supply the constant deficiency in the crops of grain, which do not furnish more than six or at most eight months' consumption. The whole amount of arable land does not much exceed 200,000 acres. Barley, maize, oats, and some wheat are the chief corn crops. Other important products are figs, oil of superior quality, strong wine both white and dark red (of which about 10,000,000 gallons are exported to Fiume, Trieste, and Venice), almonds, dates, dried currants, citrons, pomegranates, and oranges. The country abounds in timber, but, being in the interior, it is almost inaccessible: the forests in the neighbourhood of the coast have been exhausted. The coast and river fisheries employ about 8000 hands; the principal kinds of fish taken are anchovy, tunny, and salmon. Honey and wax are produced in some quantity.

The rearing of cattle is on a limited scale: the breeds are inferior and small: the stock consists of oxen, cows, horses, mules, swine, sheep, and goats; poultry, except geese and ducks, are plentiful. Among the wild animals are the Cinghlo, or wild dog, wolf, fox, and hare: swans, pelicans, falcons, vultures, owls, turkeys, and other wild fowl, are abundant. Dalmatia contains limestone, gypsum, coal, pitch, and asphalte. No precious metals have been discovered.

The inhabitants are of good stature, muscular, robust, hardy, and frugal: they live much in the open air and under tents. The poorest man drinks his wine, and eats his salad, fig, and melon. There are some Germans, Italians, Greeks, and Jews settled in the country. The language of the country is a dialect of Sclavonian, but Italian is the official language, and is spoken among the educated classes. Less than a fifth of the inhabitants are Greek Catholics; the rest, with the exception of a few Jews and Calvinists, are all Roman Catholics. The province furnishes 4 battalions of Sharpshooters to the Austrian army. Education is very generally diffused by the system of national schools.

Dalmatia is divided into 4 circles:—1, Zara, which includes the islands of Arbe, Pago, Grossa, Coronata, Mortero, and Zuri: 2, Spalatro, which includes the islands Bua, Brazza, Lesina, Lissa, Solta, Torcola, and Zirone: 3, Ragusa, to which belong the islands Curzola, Meleda, Lagosta, Giupana, and Mezzo: and 4, Cattaro.

1. In the circle of *Zara*, the chief town is *Zara*, which is the capital of the kingdom, the seat of a Roman Catholic archbishop, and of the Gubernium or government board, and has about 8000 inhabitants. The town is built on a narrow spit of ground divided from the main land by a deep moat which is crossed by a drawbridge; it is strongly fortified, and has a large commodious harbour. The chief buildings are the cathedral founded by Enrico Dandolo, doge of Venice, and the church of St. Simeon. Among the public institutions are a lyceum, gymnasium, ecclesiastical seminary, school of midwifery, hospital, arsenal, theatre, &c. The inhabitants are largely engaged in the fisheries along the coast. Zara is celebrated for the liqueur called *maraschino*. The town suffers greatly in summer from the want of fresh water. The other towns are—*Nona*, a small place north of Zara, near which large quantities of excellent tobacco are grown: *Obrovazzo*, on the Zermagna, and on the great road which leads over the Velebitchi Mountains to the Croatian military frontier [CROATIA]: and *Sebenico*, on a gulf which forms a commodious harbour at the mouth of the Kerka; the entrance to the harbour is by a narrow winding channel which is strongly fortified; the town is the seat of a Roman, and a Greek, Catholic bishop; the chief building is the cathedral; the population is about 5000.

2. In the circle of *Spalatro* the chief town is *Spalatro*, a large busy and fortified city built on the site of the Emperor Diocletian's palace [DIOCLETIAN], and near the ancient town of Salona, which is now in ruins. The town is situated on a promontory that juts out into the bay between the islands of Bua and Brazza, and has 8000 inhabitants, who carry on a considerable trade, and cultivate extensively the olive and the vine. It is built chiefly of materials taken from the ruins of the palace, many portions of which however still remain entire, as the temple of Jupiter, now the cathedral, and the temple of Æsculapius, now the church of St. John the Baptist. Spalatro has a large and safe harbour, and in consequence of its central situation, its communication

by roads with the Turkish province of Bosnia, the abundance of ship-building timber, and its fisheries, it is one of the most important ports of the Adriatic. The manufactures are leather, coarse woollens, and silk. The remarkable objects near Spalatro are the strong fortress of Clissa, in a pass in the mountains, and the remains of an aqueduct. A museum of the local antiquities has been formed at Spalatro, which is very rich in Roman remains. The other places worth notice in the circle are *Sign* in the interior, and *Opus* at the mouth of the Narenta, which are both strong fortresses; and *Trau*, which stands opposite to the island of Bua· in a well-cultivated district, and has 3000 inhabitants, who are engaged in trade and ship-building.

3. In the circle of *Ragusa* the chief town is *Ragusa* (Dubrownik), formerly the capital of a republic, and a great centre of commerce and industry. It stands on the coast, partly at the foot and partly on the steep sides of two hills in 42° 38′ N. lat., 18° 8′ E. long., and has a population of 7000. It is fortified with walls and ditches, and the entrance to the harbour is commanded by a strong castle. The houses are large and well built; the streets are paved, but except two they are narrow. The principal buildings are the cathedral and the governor's house. The town is well supplied with spring water. The neighbourhood outside the walls is laid out in gardens, vineyards, plantations of orange and other fruit trees, with here and there pretty country houses and handsome fountains. Ragusa is the seat of a bishop, has a gymnasium, several schools, soaperies, liqueur distilleries, and ship-building yards. Its trade is now of little importance except in the way of transit with the interior. The other towns of the circle are—*Ragusa-Vecchia*, a few miles S.E. of Ragusa, which stands on or near the site of the ancient Epidaurus: *Stagno*, a strongly fortified town on the isthmus that joins the peninsula of Sabioncello to the main land: and *Gravosa*, 2 miles E. from Ragusa, which has a fine harbour and docks.

4. In the circle of *Cattaro*, the most southern division of the kingdom, the chief town is *Cattaro*, which has an excellent capacious port, but with a somewhat intricate entrance. The town, which has only 3000 inhabitants, has a considerable transit trade with Albania and the interior of Turkey. It is strongly fortified, and has large barracks. A Greek vicar-general resides at Cattaro.

The islands are all mountainous; they produce timber, wine, oil, figs, and corn. The principal of them are—*Pago*, which is remarkable for the number of indentations along its coasts; a large quantity of salt is made near its chief town, which is also called Pago: ARBE, before described, which, with the neighbouring isle of Veglia, forms a bishopric: *Grossa*, which yields rich wine and oil, but is destitute of water: *Coronata*, famous for its pastures and its cheese: *Bua*, which has asphalte mines: *Brazza*, one of the most important in extent and produce, in which the chief town is Milna, where ship-building is actively carried on: *Lesina*, of which the chief town Lesina is the seat of a bishop, and has a good harbour: *Curzola*, in which the chief occupation besides agriculture is ship-building: *Lissa*, which has important fortifications and the best harbour in the Adriatic: *Meleda*, which presents remarkable precipices in the shape of funnels, in which subterranean explosions are frequently heard: and *Lagosta* or *Agusta*, which is surrounded by groups of rocky islets; it contains a grotto of great extent; on the precipitous rocks along the coast there are inscriptions in some ancient characters said to be Phœnician. The inhabitants of these islands are of necessity mariners and fishermen.

(Blumenbach; *Austrian Encyclopædia;* Hassel; Stein; Macgregor's *Statistics;* Balbi, *Géographie;* Murray's *Hand-book.*)

DALRYMPLE JAMES, first Viscount Stair, was born in 1619, at Dummurchie, in the county of Ayr. At the age of fourteen years, he was sent to the college of Glasgow, where he took the degree of A.M. in 1637. In 1638 he left the college, and at the breaking out of the civil war entered the army, and obtained a captain's commission. In 1641 however he was elected professor of philosophy in the University of Glasgow, which he resigned, according to custom, on his marriage in 1643, but was re-elected. In 1647 he resigned his chair, came to Edinburgh, and was admitted an advocate in 1648. The following year he was appointed secretary to the commissioners sent by the Scottish parliament to treat with Charles II., then an exile in Holland. He held the same office in 1650, and was on that occasion particularly noted for his 'abilities, sincerity, and moderation.' During the Protectorate he was strongly recommended by Monk as a judge of the Court of Session; he was appointed, and in July 1657 he took his seat on the bench.

At the Restoration he went to London to pay his respects to the king. On that occasion the honour of knighthood was conferred upon him; and in Feb. 1661 he was nominated one of the lords of session. He however refused to sign the declaration enacted in 1663, and his seat was declared vacant. He then, with his eldest son, made a tour on the Continent, and on his return was allowed to qualify his subscription to the declaration, and was restored to his seat. He was also made a baronet, and in 1671 appointed president of the Court of Session.

Dalrymple continued president till the year 1681, when, on account of his opposition to the Test Act, he was superseded, and found it necessary to retire into Holland.

In 1681 he published his 'Institutions of the Law of Scotland,' the work of a great and philosophic mind. It gave consistency to the body of Scots law, and till our own day has guided the determinations of the Scottish lawyers. From his retirement at Leyden he transmitted to the Edinburgh press his 'Decisions of the Court of Session from 1661 to 1681;' the first volume appearing in 1684, and the second in 1687. In 1686 he published at Leyden his 'Philosophia Nova Experimentalis.'

On the accession of King James II., Dalrymple's eldest son was appointed lord advocate of

Scotland, and had influence enough to procure a pardon for his father, who, on the testimony of Spence, the secretary of Argyle, had been prosecuted and outlawed for his alleged concern in the Rye-House Plot. Dalrymple, on coming over to this country with the Prince of Orange, with whom he had been much in favour while in Holland, was reinstated in the presidency of the Court of Session. In April 1690 he was raised to the peerage by the style and title of Viscount Stair.

Stair died Nov. 23, 1695, shortly after the publication of his work entitled 'A Vindication of the Divine Perfections,' and was buried in the high church of Edinburgh.

DALRYMPLE, JOHN, second Earl of Stair. He was born at Edinburgh on the 20th July, 1673, and in early youth had the misfortune to kill his elder brother by the accidental discharge of a pistol. In 1692, when but a youth of nineteen, he entered as a volunteer under the Earl of Angus, commander of the Cameronian regiment at the battle of Steinkirk. In 1702 he served as aide-de-camp to the duke of Marlborough at the taking of Venlo and Liege and the attack on Peer; and in the course of the year 1706 he successively obtained the command of the Cameronian regiment and the Scots Greys. On his father's death in the beginning of 1707, he succeeded to the earldom of Stair, and was soon afterwards chosen one of the representative peers of Scotland in the United Parliament. In the subsequent victories of Oudenarde, Malplaquet, and Ramillies, he held high command and obtained great distinction; but, on the accession of the new ministry in 1711, he retired from the army.

After the accession of George I., the Earl of Stair was appointed commander-in-chief of the forces in Scotland, and in 1715 he was sent on a diplomatic mission to France, in which he displayed much skill and address, and remarkable splendour and magnificence. He was recalled in 1720, and for the next twenty-two years lived in retirement at his seat in New Liston, where he turned his attention to agriculture, and was the first in Scotland to plant turnips and cabbages in the open fields.

On the dissolution of the Walpole administration in 1742, he was recalled to public life, and served in a military capacity on different important occasions till his death, which happened at Queensberry House, Edinburgh, May 9, 1747.

DALRYMPLE, SIR DAVID, better known by his titular designation of Lord Hailes, was born at Edinburgh, October 28, 1726. He was educated at Eton College, and at the universities of Edinburgh and Utrecht. On his return from Utrecht, where he had studied the civil law, he prepared for the bar, and passed advocate on February 24, 1748. After eighteen years of professional life, he was raised to the bench of the Court of Session, and in 1763 was appointed a lord of justiciary. As a judge, his accuracy, diligence, and dignity, were eminently conspicuous. His publications are very numerous, but they are mostly compilations: a list of them is given in Watt's 'Bibliotheca Britannica.' Lord Hailes died Nov. 29, 1792.

DALRYMPLE, ALEXANDER, was born at New Hailes, the seat of his father, Sir James Dalrymple, Bart., on the 24th July, 1737, and was the seventh son of a family of sixteen children, all of whom he survived. His scholastic education was very limited, and, when scarce sixteen years of age, he went abroad as a writer in the East India Company's service. In India he made successful efforts to remove the defects of his early education. He taught himself French and Spanish, and made himself active and useful in the affairs of the company. To promote their commerce he undertook a voyage to the islands of the Eastern Archipelago, for which services the court of directors in 1769, after his return to England, voted him 5000*l.*, and employed him to draw up several charts of the eastern seas, which were published under their authority.

On Lord Pigot's appointment to be governor of Fort St. George, in 1775, Dalrymple was reinstated in the service of the East India Company, and went out to Madras as a member of council and one of the committee of circuit; but in 1777 he was recalled. Two years afterwards he was appointed hydrographer to the East India Company; and in 1795, when the admiralty at last established the like office, it was given to Dalrymple. This place he retained till 1808. In May of that year he was called on to resign on the ground of superannuation, and on June 19 he died.

He left a large library, particularly rich in works on navigation and geography, a few of which were purchased by the admiralty, and the remainder were sold by auction. His own works amount to about sixty. A list of them is appended to a memoir of the author, furnished by himself, in the 'European Magazine' for November and December, 1802.

DALTON, JOHN, was born Sept. 5, 1766, at Eaglesfield, near Cockermouth, in Cumberland. He attended school till the age of twelve years, and afterwards employed most of his time as usher at a school in Kendal till 1793. In that year he obtained, through the friendship of Mr. Gough of Kendal, the situation of Professor of Mathematics and Natural Philosophy in a new college at Manchester, which was removed to York in 1799. He became a lecturer on science about the year 1800, and lectured in many of the large towns of England. He became successively Secretary, Vice-President, and President of the Literary and Philosophical Society of Manchester, which owed much to his exertions. In 1822 he paid a visit to Paris, where he was received with distinction by the chief literary and scientific men. In 1826 he received the gold medal from the Royal Society for his chemical discoveries. He was one of the founders of the British Association in 1831. In 1833 a pension of 150*l.* a year was given to him by William IV., which was raised in 1836 to 300*l.* In 1834 the University of Edinburgh conferred on him the degree of LL.D. He was attacked by paralysis twice in 1837; and after a third attack in the spring of 1844, he died July 27, 1844.

Dalton's life was an important one for the science of chemistry; but his labours were not exclusively confined to that science. He contri-

buted in his early days to the 'Gentleman's Diary' and 'Lady's Diary.' He published some 'Meteorological Essays' in 1793, and continued to make meteorological observations till the day before his death, the whole number so made and registered amounting to 200,000. In 1794 he published a paper relating to a peculiar defect in his own vision. In 1801 he went out of his usual path by publishing 'Elements of English Grammar.' In the Manchester Memoirs for 1802 there are six papers by Dalton, chiefly on subjects of meteorology, of which the most important is one called 'Experimental Essays on the Constitution of Mixed Gases; on the Force of Steam, or Vapour from Water and other Liquids, in different Temperatures, both in a Torricellian Vacuum and in Air; on Evaporation; and on the Expansion of Gases by Heat.' The principles laid down in these essays have been of the highest importance to chemists in their investigations respecting the specific gravity of gases, and have enabled them to solve many interesting problems.

Dalton began to work out his grand discovery of the atomic theory in 1803. Dr. Thomson, Dr. Wollaston, and Mr. Davies Gilbert, all perceived the importance of the new principles before Davy; but, when that illustrious chemist was once convinced of their validity, he took them up with the greatest zeal and earnestness. This theory, perhaps the most important contribution ever made to chemistry, is explained in ATOMIC THEORY. In 1808 Dalton published the first volume, in 1810 the second, and in 1827 the third volume of his 'New System of Chemical Philosophy;' in which he propounded many valuable truths, and gave precision to the mathematical principles of chemistry.

Dr. Dalton's other works, which are tolerably numerous, are inserted in the 'Manchester Transactions,' 'Nicholson's Journal,' the 'Philosophical Transactions,' and the 'Philosophical Magazine,' and consist of experiments and observations on heat, vapour, evaporation, rain, wind, the aurora borealis, dew, and a variety of other physical subjects.

Dr. Dalton was of middle stature, and strongly made. His power of mind was naturally strong; he was a patient observer, and an independent thinker, with the most perfect self-reliance, and with an extraordinary power of tracing the relations of physical phenomena. His moral character was worthy of his intellectual. He was a man of the strictest truth and honesty; independent, grave, reserved, but not austere; frugal, but not parsimonious. He was a member of the Society of Friends. He was never married. Dalton was elected a Fellow of the Royal Society about 1821; he was elected a corresponding member of the Institute of France, and a few years later was enrolled a foreign Fellow. He was also a member of the Royal Academies of Science of Berlin and Munich, and of the Natural History Society of Moscow.

(Thomson's *History of Chemistry*, vol. ii.; *Pharmaceutical Journal*, Oct. 1841; *Life and Discoveries of Dalton*, in *British Quarterly Review*, No. 1; *British Association Reports.*)

DAMAGES, for which the Law Latin uses the word *Damna*, signifies a compensation in money which a man gets by the verdict of a jury for some wrong that he has sustained. The damages in any action in which compensation for a wrong may be got are assessed by a jury; and, when judgment is given, the plaintiff is entitled to get these damages from the defendant.

DAMASCE'NUS, NICOLA'US, an historian of the age of Augustus, and the friend of Herod the Great, tetrarch of Judæa, is mentioned by Josephus, Athenæus, Eusebius, and others. He wrote various works in Greek, and among them one on universal history, in 144 books, of which some fragments are extant: 'N. Damasceni Historiarum Excerpta et Fragmenta quæ supersunt,' 8vo., Leipzig, 1804; and again in Paris, 1805, edited by Coray.

DAMASCE'NUS, JOANNES, was born at Damascus towards the end of the seventh or the beginning of the eighth century of our æra. His numerous philosophical and theological works place him among the most distinguished writers of the Eastern church in the eighth century. His principal work is an exposition of 'the orthodox faith,' or Christian doctrines, in four books, which unites the two systems of scholastic and dogmatic theology, the former being by ratiocination, according to the Aristotelian or scholastic method, and the second by the authority of the Scriptures and the fathers. This work attained great reputation in the Greek Church, and the author was styled Chrysorrhoas, or 'Golden-flowing,' on account of his eloquence. He wrote also letters and treatises against heretics, especially against the Manichæans and Nestorians. His principal works have been published by Lequien, 'Opera J. Damasceni,' Paris and Venice, 1748, 2 vols. fol.

DAMASCUS, a city of Syria, and the capital of the Eyalet of Damascus, in Asiatic Turkey, is situated in a fertile plain at the eastern base of the Antilibanus ridge, about 180 miles S. by W. from Aleppo, in 33° 27′ N. lat., 36° 25′ E. long, and has 140,000 inhabitants, of whom 12,000 are Christians and 12,000 Jews. The Mohammedan population is said to be the most fanatical and intolerant in Turkey. It is one of the most ancient towns in the world, being mentioned as existing in the time of Abraham. (Genesis, xiv. and xv.) It appears to have been in the time of David (1 Kings, xi. 24) the capital of an independent kingdom. It was subsequently annexed to the empire of Assyria, afterwards to that of Persia; it then fell into the hands of the Macedonians, the Romans, and lastly of the Arabians, A.D. 634. [ABU-BEKR.] It became for a time the residence of the Kaliphs, and after other vicissitudes was taken by the Turks under Sultan Selim. In the war between the Porte and Mehemet Ali, pasha of Egypt, Damascus was taken by the troops of the latter, to whom it was formally ceded by the sultan by the peace of 1833. But, when the Egyptians were compelled to evacuate Syria in 1840, the city again came into the hands of the Turks.

The view of Damascus from the mountain of Saleyeh, N.W. of the city, is very impressive; it

comprises the town, with its numerous domes and minarets, the extensive woods, orchards, and gardens with which it is surrounded, and the vast level plain stretching to the east farther than the eye can reach, and bounded to the south-east by the distant mountains of Haouran. The river Barrady and other streams furnish the city and the plain of Damascus with a constant supply of water, which is distributed into numerous canals for irrigation. The town, which is about 6 miles in circumference, is surrounded by old brick walls. The streets are narrow, and many of them have a gloomy, dilapidated appearance, being lined with dead brick walls, which are entered by small doors, that open into the courts of the respective houses. Many of these houses are splendid in the interior, the courts being paved with marble and kept cool by fountains. There are no carriages in Damascus, and but few carts; camels, horses, mules, and asses constituting the means of conveyance. The great khan is a sumptuous structure, built of alternate layers of black and white marble. The principal mosque is also a fine building: it was originally a Christian cathedral dedicated to St. John. There is also an extensive citadel, and a seraï or palace in which the pasha resides. A Franciscan convent has been long established in the city, and the Greek patriarch of Antioch usually resides there. The bazaars are better lighted, and have a more elegant appearance, than those of Cairo and Constantinople. Every class of commodities has its own street or bazaar. The town is well supplied with snow and ice from the neighbouring mountains; and ice-water, mixed with the juice of figs or currants, is a favourite beverage. The best coffee-houses of Damascus are situated in the suburbs on a branch of the Barrady; they are built of wood, and are cool and well shaded from the sun. A British consul resides at Damascus.

Damascus is the chief emporium of the trade in European manufactures with Bagdad, Bassora, Persia, and the neighbouring countries, whither goods are conveyed by camels; it is also a place of great manufacturing industry, and contains silk factories, cotton printing and dyeing establishments, tobacco factories, copper and iron foundries, glass-works, soaperies, &c. There are nearly 800 merchants engaged in the sale of damask cloths alone. The manufacture of Damascus blades, once so famous, no longer exists. Saddles and bridles, both rich and highly finished, fine cabinet-work, and rich jewellery are among the articles of Damascene industry.

Beirut is the port of Damascus. The exports and imports are given under Beirut. The great Hadji caravan, consisting of from 50,000 to 60,000 pilgrims from various parts of Turkey, goes every year from Damascus to Mecca.

DAMASK, a description of woven cloths composed both of flax and of silk, which are believed to have been originally brought from Damascus. Silk damask weaving was introduced into England from Flanders in the latter half of the 16th century, and linen damask weaving in the latter half of the 18th. Damask cloths are of thick texture, but fine in quality, and the weaving of them puts into requisition all the skill of the weaver for the production of the elaborate patterns which they bear.

DA'MASUS I. was elected bishop of Rome after the death of Liberius, A.D. 366, and established after a violent and bloody opposition. Damasus held several councils for the purpose of condemning heretics, and especially the Arians, the Apollinarians, and the Luciferians. There are a few letters of Damasus which have been preserved by Theodoretus and St. Jerome. Damasus was one of the most learned and influential among the earlier bishops of Rome. He died in 384, and was succeeded by Syricius.

DAMASUS II. [Popes.]

DAMAUN, a district of Afghanistan, which extends along the west bank of the Indus between 31° and 33° N. lat., and includes the tract of country comprehended between the Salt range, the Soliman range, and the Indus. This district consists almost wholly of plains, and great part of the soil is sandy and sterile, and the country is very thinly populated. Dera-Ishmael-Khan, the capital of the district, stands on the west bank of the Indus, in 31° 50′ N. lat., and 70° 33 E. long., and is inclosed by a wall of unburnt bricks about a mile and a half in circumference.

DAMIENS, ROBERT FRANÇOIS, was born in 1715, in a village of Artois. He passed through life first as a soldier, and then as a menial servant with not a very good character, and has only acquired celebrity by his attempt to assassinate Louis XV., and by his barbarous punishment. At that time France was distracted by the long quarrel concerning the bull Unigenitus. Many of the parish clergy were opposed to the bull, and by their preaching and other methods excited a strong feeling in the minds of the people against the court which had forced the parliament of Paris to register it. These circumstances are said to have made a deep though confused impression on the excitable but ignorant mind of Damiens, who fancied that by killing or at least wounding the king he would effect a change in the system of the government. He therefore went to Versailles; and on Jan. 5, 1757, as Louis was stepping into his carriage, Damiens stabbed him with a knife. The wound was slight, and the king, after a few days, recovered. Damiens did not attempt to run away, but was secured, examined, and put to the torture, and ultimately condemned as a regicide to be torn in pieces by four horses. The sentence was executed on the 28th of March, 1757, on the Place de Grève. Before being put to death, he was tortured for one hour and a half on the place of execution with red-hot pincers, molten lead, and other cruel contrivances. It was altogether one of the most disgraceful exhibitions that ever took place in a civilised country.

DAMIETTA, a town of Lower Egypt, on the right bank of one of the principal branches of the Nile, about 6 miles above its mouth. It has 20,000 inhabitants. The town has some fine mosques, several bazaars, a vast rice granary erected by Mehemet Ali, and a great number of baths. Many of the houses have pavilions on the roofs for enjoying the cool breezes. Its foreign

trade has greatly declined. The merchant ships remain at anchor outside of the bar, and load and unload by means of boats. Rice is one of the chief articles of exportation. At Damietta and in the neighbourhood are manufactures of fine cotton cloth, towels, &c.; carding and spinning machinery is used in the cotton factories. The country around is a complete garden, yielding all kinds of fruit, such as oranges, lemons, figs, tamarinds, pomegranates, &c. The lake Menzaleh, east of Damietta, affords an abundant supply of fish. Damietta is the head town of a department which extends eastwards along the lake Menzaleh as far as El Arish on the borders of the Syrian desert.

DAMMER PINE. [AGATHIS.]

DAMPIER, WILLIAM, was born in 1652; he went early to sea, and afterwards became overseer of a plantation in Jamaica. He thence went to the Bay of Campeachy with other log-wood cutters, and remained there several years. He kept a journal of his adventures and observations on that coast, which was afterwards published, 'Voyages to the Bay of Campeachy,' London, 1729, with a 'Treatise on Winds and Tides.' Dampier, besides being a bold seaman, had also studied navigation as a science. In 1679 he joined a party of buccaneers, with whom he crossed the Isthmus of Darien, and, having embarked in canoes and other small craft on the Pacific Ocean, they captured several Spanish vessels, in which they cruised along the coast of Spanish America, waging a war of extermination both by sea and land against the subjects of Spain. In 1684 Dampier sailed again from Virginia with another expedition, of which he has given a most interesting account in his 'Voyage round the World.' His abilities becoming known, he was appointed commander of a sloop of war in the king's service, and was sent on a voyage of discovery to the South Seas. Dampier explored the west and north-west coasts of New Holland, surveyed Shark's Bay, and gave his name to a small archipelago east of North-West Cape. He also explored the coasts of New Guinea, New Britain, and New Ireland, and gave his name to the straits which separate the two former. On his homeward voyage he was wrecked on the Isle of Ascension. He at last returned to England in 1701, when he published the account of this voyage. In 1707 he published a 'Vindication of his Voyage to the South Seas in the ship St. George,' with which he had sailed from Virginia in his former marauding expedition. Dampier went to sea again till 1711, but the particulars of the latter part of his life are little known. He ranks among the most enterprising navigators of England. He was acquainted with botany, and was possessed of considerable information and general knowledge. His style of narrative is vivid, and bears the marks of truth. His voyages were published together in 3 vols. 8vo., London, 1697-1709.

DAMSON, or DAMASCENE, a kind of plums cultivated in this country for the sake of their hardiness and prolific habits. They are a mere form of the domestic plum, from which there are no certain characters to distinguish them, except the abundance of their late oval fruit, and the property they possess of propagating by suckers. All the varieties are used for kitchen purposes principally, and are generally confined to the gardens of cottages or farm-houses, where the quantity of produce is more valued than its quality. Much the finest variety of this sort of plum is that called the Shropshire Damson, which is extensively multiplied in the nurseries by grafting.

DANCE, GEORGE, was architect to the Corporation of London, and erected the Mansion House, which was begun in 1739. Ralph, the architectural oracle of London in the last century, says, in regard to it, 'The man pitched upon, and who afterwards carried his plan into execution, was originally a shipwright; and, to do him justice, he appears never to have lost sight of his first profession.' Whether such was really the case, we are unable to say; but as to the structure, if in some respects rather uncouth, it is at all events a stately mass, and has a 'monumental' look. Telford says of it, 'It is grand and impressive as a whole, and reflects credit upon its architect.' Dance also built the churches of St. Botolph, Aldgate; St. Luke; and St. Leonard, Shoreditch. He died February 8, 1768, and was succeeded in his appointment of City Surveyor by his eldest son,

DANCE, GEORGE, Junior (born in 1740), whose talent acquired for the family name far higher distinction. He was trained up to architecture, and applied himself to the study of it with great diligence, and he further possessed both a natural and cultivated taste for the fine arts generally. In 1770 he began the erection of Newgate, one of the few truly monumental pieces of architecture in the metropolis, and the design of which has been generally and deservedly praised. Giltspur Street Compter and St. Luke's Hospital were also by Dance, and are creditable to him, which is more than can be said of the front of Guildhall, erected by him in 1789. The Shakspere Gallery, Pall Mall, now the British Institution, and the Theatre at Bath, are among his minor works: in the front of the last he introduced the tasteless heresy adopted by his pupil Soane, of pilasters without bases or capitals.

Dance was not only one of the earliest members of the Royal Academy, but held for several years the office of Professor of Architecture; yet he never delivered any lectures, nor does he seem to have exhibited drawings at its exhibitions. But he published an interesting series of portraits of the public characters and artists of the day, in two volumes folio, 1811–14, engraved by Wm. Daniell, R.A. Dance held his appointment of City Surveyor till 1816, but he survived until Jan. 14, 1825. He was buried in St. Paul's, near Wren and Rennie.

DANCING. [BALLET.]

DANCOURT, FLORENT CARTON, a French dramatist and actor of the times of Louis XIV., was born in 1661, and studied at Paris under the Jesuit Larue. After practising as an advocate for some time, he fell in love with the daughter of the comedian, La Thorilière, an attachment which induced him to quit his legal

studies and appear on the stage. Having married Mlle. La Thorilière, he became one of the king's comedians, and continued such for 38 years, when he retired to his estate at Berri, where he passed the remainder of his life in devotional exercises, and wrote some psalms, and a sacred tragedy, which is not extant. He died in 1726. The works of Dancourt occupy six vols. They were most of them successful at the time they were written. The greater number of them are farces, the scene of which lies mostly in low life. There is a drollery about them and a smartness in the dialogue which will always render them amusing, but the interest they possessed at the time of their appearance is now lost.

DANDELION, a corruption of the French name 'Dent de Lion,' or Lion's Tooth, a common weed with a tapering milky perennial root, resembling that of a succory: like the latter, it is sometimes cut into pieces, roasted, and employed to adulterate coffee. Its leaves have also been forced in the winter as salad; but its excessive bitterness prevents its being much employed in this way.

DA'NDOLO, ENRICO, a patrician of Venice, who was elected doge in 1192 at a very advanced age. In the year 1201, he accompanied the French crusaders in their expedition to restore Alexius to the throne of Constantinople, and was the soul of the expedition, though then nearly 90, and almost blind. He was one of the first to land, on the first attack in 1203, and to take possession of part of the ramparts, on which he planted the standard of St. Mark, and assisted at the storming in 1204. Dandolo refused the imperial crown, which the crusaders had offered to him, but accepted the title of Despot of Romania. He died shortly after, in 1205, and was buried in the church of Santa Sophia.

DANEGELD was a tax originally imposed in order to purchase peace with the Danes, and means Danish payment. Whilst the invasions of the Danes were almost annual, our kings derived little profit from this tax; but, after the accession of the Danish princes to the throne of England, it became one of the chief branches of the royal revenue; and it continued to be collected as low as 21 Hen. II., if not later, though more than once promised to be remitted.

DANES is the general appellation given to the Scandinavian tribes who in the 9th and 10th centuries became so formidable by their predatory expeditions, and who invaded and occupied a great part of Britain and France. Their predatory descents on the coast of Britain became formidable during the reign of Egbert; and under his successors the Danes obtained possession of great part of the island, until Alfred the Great defeated them, and obliged the Danish chieftains to submit. [ALFRED.] After the death of Alfred fresh incursions took place, until, at the beginning of the 11th century, Canute, or Knut, added Britain also by conquest to his sceptre. [CANUTE.] Shortly after Canute's death the line of the Saxon kings was restored in the person of Edward the Confessor. The Norman Conquest, which followed close upon the death of the latter, put an end to the Danish invasions on the coasts of Britain.

DANIEL. The history of Daniel is contained in the book which bears his name. From this we learn that he was in the first band of Hebrew captives sent to Babylon in the fourth year of Jehoiakim, about seven years before the deportation of the second band, which included Ezekiel. It appears from the history that he was quite a youth at this time; and, as those carried into captivity on this occasion appear to have been exclusively persons of consideration and youths of distinguished families, there is every reason to believe that Daniel must have belonged to a family of rank and consequence. Daniel, being one of the youths selected to be brought up for future service at the court of the conqueror, received instruction in all the learning of the Chaldæans. But it was through the wisdom given him from above, and the signal favour of God manifested remarkably towards him before the eyes of the heathen, that he rose to distinction at the court of Babylon, and was held in high consideration by its successive kings, through all the seventy years in which his nation remained in captivity, and whose condition in captivity was probably much meliorated through his influence. As Josephus observes, he was the only one of the prophets who enjoyed a high degree of worldly prosperity. His life was however not without its trials, disturbed as it was by the envy and murderous plots of jealous courtiers; but all these served but the more to manifest his righteousness and faith, and in the end tended to establish him all the more firmly in his high place. Daniel must have lived to a great age. There is an interval of seventy years between the dates of his first prophecy (ii. 1) and of his last (x. 1). Some suppose him to have been twenty years of age when carried into captivity; he was very possibly younger. However, ten years after, we find him celebrated for his piety and wisdom (Ezek. xiv. 14, 20), which seems indeed to have become proverbial (Ezek. xxviii. 3). At the date of his last prophecy, in the third year of Cyrus, he must have been about ninety years of age; and it is not probable that he survived much longer.

The Hebrews always accounted this book as canonical. Josephus calls Daniel not only a prophet, but one of the greatest of the prophets; adding, that he not only, in common with other prophets, foretold future things, but also fixed the precise time of their coming to pass. Our Saviour also cites him as 'Daniel the prophet' (Matt. xxv. 14), and gives himself, in virtue of the expression in Dan. vii. 13, the title of 'Son of Man;' while the apostles repeatedly appeal to it as an authority (for instance, 1 Cor. vi. 2; 2 Thess. ii. 3; Heb. xi. 33).

DANIEL, SAMUEL, was born in Somersetshire, in 1562, and educated at Magdalen Hall, Oxford, which however he left without a degree. He became tutor to Lady Anne Clifford, subsequently Countess of Pembroke, and was afterwards groom of the privy chamber to Anne, queen of James I. He is said to have been poet-laureat on Spenser's death; but it is more

likely that he was only one of many employed about the court in writing masques and birth-day odes, and in this capacity he seems to have stirred the wrath of Ben Jonson, who probably held him in the light of a rival. Towards the end of his life he retired into Somersetshire, where he died in 1619. His will is preserved in the Prerogative Court at Canterbury, and in Rymer's Fœdera exists a patent granting him the exclusive printing of his 'History of England' for the term of ten years.

His poems consist of an heroic poem, in six books, on the wars of York and Lancaster: it contains many stanzas in his best style, which unite grace of language with sweetness of thought. The poem next in length is 'Musophilus,' a dialogue between Musophilus and Philocosmus. It is his master-piece both in thought and execution. The other poems contained in the edition of 1602 are, a letter from Octavia to Mark Antony, which shows to a striking extent that faculty peculiar to a true poet, which has been called dramatic power; 'The Tragedy of Cleopatra,' in alternate rhymes, with choruses on the antique model; and 'The Complaint of Rosamond.' Besides these poems are 57 sonnets to Delia, several masques, odes, and epistles. His prose works are, 'A History of England, in two parts, extending to the reign of Edward III.,' and 'An Apology for Rhyme,' which last shows a close acquaintance with the rules and niceties of his art, and contains several remarks on rhythm, interesting in illustration of the change in pronunciation which had taken place since Chaucer.

(Southey's *British Poets;* Wood's *Athen. Oxon.;* Fuller's *Worthies; Biographia Britannica.*)

DANIEL, LE PÈRE, a Jesuit, born at Rouen in 1649, wrote the history of France from the commencement of the monarchy, 3 vols. fol., 1713, which he dedicated to Louis XIV., who made him historiographer of the kingdom, with a pension of 2000 francs. But the work is very imperfect: the author says little concerning the state of society: it is a history of the kings rather than of the people. His style also is feeble and uninteresting. The best edition of his history is that in 17 vols. 4to., Paris, 1755 60, with considerable additions by Father Griffet. Père Daniel wrote several other works of no great value. He died in 1728.

DANIELL. William Daniell, R.A., painter and engraver, was born in 1769, and at the age of fourteen accompanied his uncle, Thomas Daniell, to India. They took an amazing number of sketches, many of which they afterwards engraved and published, in a large form, comprised in one great work entitled 'Oriental Scenery,' in six volumes folio, completed in 1808. Besides the above work, William Daniell engraved and published, between 1801 and 1814, several others. Between 1814 and 1825 he was chiefly engaged in a work of extraordinary labour, entitled 'Voyage round Great Britain.' Daniell also painted many large and beautiful oil pictures of remarkable places or scenes in India. In 1832 he painted, in conjunction with Mr. Paris, a panorama of Madras; and, more recently, two others by himself—'The City of Lucknow,' and 'The Elephant Hunt.' He died in 1837.

Thomas Daniell was likewise a member of the Royal Academy, and a very able landscape painter and engraver. He published some works on India besides that already mentioned. He died in 1840, aged ninety-one.

Samuel Daniell, another member of this family, spent three years at the Cape of Good Hope, and published, in 1808, some prints, descriptive of the scenery, habitations, costume, and character of the natives, and an account of the animals of Southern Africa. He published also, in 1808, illustrations of the scenery, animals, and native inhabitants of the island of Ceylon.

DANIELL, JOHN FREDERICK, was born in London, March 12, 1790. At an early age he became a pupil of Professor Brande, in whose society he made several tours. Mr. Daniell entered originally into business as a sugar-refiner. His fondness for scientific investigations was however manifested at a very early age, and he soon relinquished business for pursuits more congenial to his taste. In 1814 he became a fellow of the Royal Society. In 1816, associated with Professor Brande, he commenced the 'Quarterly Journal of Science and Art,' the first twenty volumes of which were published under their joint superintendence. He married, in 1817, a daughter of Sir W. Rule, surveyor of the navy. From this time to his death hardly a single year elapsed without the appearance of one or more essays on chemical or meteorological subjects from the pen of Mr. Daniell. In 1820 he published the account of his new Hydrometer, an instrument which, for the first time, rendered regular and accurate observations on the dryness and moisture of the air practicable. In 1823 his great work, 'Meteorological Essays,' appeared, which is still the standard work on the science of which it treats. A second edition was published in 1827, and he was engaged in revising proofs of the third edition at the time of his death. In the year 1824 he published an 'Essay on Artificial Climate,' for which he received the silver medal of the Horticultural Society. He became managing director to the Continental Gas Company. On the establishment of King's College in 1831 he was appointed Professor of Chemistry, the duties of which office he discharged to the day of his death. About this time he published the account of his new Pyrometer, for which he received the Rumford Medal from the Royal Society. From this time his attention seems to have been principally devoted to voltaic electricity; and he received two more medals for excellent papers written by him. In 1839 he published his 'Introduction to Chemical Philosophy,' an admirable treatise on the action of molecular forces in general.

In 1843 the University of Oxford conferred upon him the honorary degree of D.C.L., and in the same year he published the second edition of his 'Introduction to Chemical Philosophy.' For more than thirty years he was a zealous and active member of the Royal Society, and for the last six years he held the honourable office of foreign

secretary to that body. Besides his professorship in King's College, he held the post of lecturer to the East India Company's military seminary at Addiscombe, and was examiner in chemistry to the University of London since the opening of that institution. He died suddenly on March 13th, 1845.

Besides the complete works above mentioned, Mr. Daniell was the author of nearly 40 papers in the Scientific Journals and Transactions.

DANNECKER, JOHANN HEINRICH, was born at Stuttgart, Oct. 15, 1758, of parents in humble circumstances. When only six years of age, he evinced signs of that talent for art for which he was afterwards so eminently distinguished. His first essays were flowers and soldiers, which he drew on any scrap of paper that came into his hands, or he scratched them upon stones. In 1771, however, in his fourteenth year, Dannecker entered, by desire of the Duke of Würtemberg, in whose service his father was employed, but against his father's wish, the school established at Ludwigsburg for the education of the children of the court-servants. He made such progress that he obtained the prize for the best model of Milo of Croton destroyed by the Lion; upon which he was appointed sculptor to the duke, with a salary of 300 florins per annum. In 1783 he went with Scheffauer on foot to Paris, and there studied under Pajou. After a two years' stay in Paris, the two friends departed together, again on foot, for Rome, where Dannecker remained until 1790, and contracted a friendship there with Herder, Göthe, and Canova. A Ceres and Bacchus which he executed in Rome were Dannecker's first works in marble: they are now in the palace at Stuttgart. Several of the statues and groups which he executed subsequently are very beautiful. The Ariadne reclining on a Leopard, now at Frankfort, is well known from the numerous statuette copies.

After 1790 Dannecker lived, with the exception of a few short intervals, wholly at Stuttgart. He was Professor of Sculpture and Director of the School of Art at Stuttgart, and inspector of the Royal Gallery of Ludwigsburg. He was offered, in 1808, the Professorship of Sculpture in the Academy of Munich, which he declined. He died on the 8th of December, 1841.

Dannecker's greatest excellence was in his busts; he has left many interesting monuments in this branch of art, and foremost among them are the small and colossal busts of Schiller, the busts of Lavater, Glück, the kings Frederic and William of Würtemberg, and other members of the royal family, and the medallions of Haug and Jung Stilling.

DA'NTE ALIGHIE'RI was born at Florence in 1265. His Christian name was *Durante*, which in familiar use was contracted into *Dante*, by which name he has become generally known His family was noble. He was a great-grandson of Cacciaguida Elisei, who married a lady of the family of Alighieri of Ferrara, and whose children assumed the arms and the name of their mother. Dante's father, Aldighiero Alighieri, died while Dante was yet a child. As Dante grew up, he showed great capabilities for learning, in which he was assisted by Brunetto Latini, a celebrated scholar of the time. He became also intimate with Guido Cavalcanti, a young man of an inquisitive and philosophical turn of mind. It is evident from his works that he had read deeply, and was imbued with all the learning of his age. By his own account he seems to have led rather a licentious life until he fell in love with Beatrice Portinari, of an illustrious family of Florence. The lady died about 1290, when Dante was about 25 years of age, but he continued to cherish her memory, if we are to judge from his poems, to the latest period of his life. It must have been about or a little before the time of Beatrice's death that he wrote his 'Vita Nuova,' which is a series of canzoni intermixed with prose, in which he speaks of his love in a spiritual and platonic strain, and of the change it produced in him, which was the beginning of his 'new life.'

The party of the Guelphs was at that time predominant at Florence, having some years before driven away the Guibelines with the assistance of the pope and of Charles of Anjou, king of Naples. [GUELPHS and GUIBELINES.] Dante was a Guelph, and took an active part in the political affairs of his native city; but when the parties named respectively the Bianchi and the Neri arose in Florence, Dante, though connected by marriage with the Donati, the leaders of the Neri, attached himself to the Bianchi, who subsequently joined themselves to the Guibelines. Dante shared to the fullest extent in the reverses of the Bianchi in Florence; his house was plundered, and he himself was exiled. He now began his wanderings, renouncing his Guelph connections, and intent upon exciting the Guibelines of Italy against his enemies and the oppressors of his country. These wanderings ended only with his life; for his efforts to obtain a revocation of his sentence by writing a pathetic letter to his countrymen were ineffectual. He resided successively at Verona, near Arezzo, at Padua, and other places. On the election of Henry of Luxemburg to the crown of Germany, Dante, about 1310, addressed a circular letter 'to the king, dukes, marquises, counts, the senators of Rome, and all the people of Italy, congratulating them on the prospect of happiness for Italy through the ministry of the pious Henry, who will punish the felons who opposed him and bestow mercy on the repentant,' &c. It was about this time that he wrote his book 'de Monarchia,' which may be considered as a profession of Guibeline political faith.

Henry VII. came to Italy in 1310; he was crowned at Milan as king of Lombardy, and the following year he besieged Cremona, Brescia, and other places. It was about this time that Dante, impatient to see the emperor come into Tuscany to put down the Guelphs, addressed to him an epistle, in which he entreats the emperor not to tarry any longer on the banks of the Po, but to advance south of the Apennines and put down the spirit of Guelph sedition at Florence. Henry came into Tuscany, threatened Florence, but without effect, was crowned at Rome, and

on his return died suddenly at Buonconvento, near Siena, in August 1313. This was a terrible blow to the hopes of the Guibelines, and of Dante especially. He now took refuge at Verona, at the court of Cane della Scala, where he appears to have been before, between 1308 and 1310.

In 1317-18, Dante appears to have been still wandering about Italy. In 1319 he repaired to Guido da Polenta, lord of Ravenna, where he was hospitably received, and where he appears to have remained till his death, which happened in September 1321. He was buried in the church of the Minorites, under a plain monument, which was reconstructed in its present form by Cardinal Valenti Gonzaga in 1780.

Of Dante's 'Divina Commedia,' the great poem on which his fame is founded, we cannot enter here into any details, and we must refer the reader to the numerous commentaries, illustrations, and translations of it in every language of Europe. It is one of the few works of imagination which have stood the test of ages, and which will pass down to the remotest generations. It resembles no other poem: it is not an epic; it consists of descriptions, dialogues, and didactic precepts. It is a vision of the realms of eternal punishment, of expiation, and of bliss, in the invisible world beyond death. Its beauties are scattered about with a lavish hand, in the form of episodes, similitudes, vivid descriptions, and, above all, sketches of the deep workings of the human heart. That many parts of his poem are allegorical is evident; but that the whole poem is an allegory, a political mystification, as some have pretended, is a far-fetched hypothesis. Dante never published his whole poem in his lifetime, for he had spoken in it too plainly to be able to publish it with safety. He wrote it in detached parts, and at different periods, and his strains were influenced by the various political vicissitudes of the times, and by his own alternate hopes and despondency.

For the manner in which the whole MS. of Dante's poem was found, collected, transcribed, and published, after his death, by his sons Jacopo and Piero, the early commentaries on the poem, its early printed editions, and the whole bibliographic history of the work, the reader will find ample information in Foscolo's 'Discorso sul Testo di Dante,' London, 1825; and also in Missirini, 'Rivista delle Varie Lezioni della Divina Commedia, e Catalogo delle piu Importanti Edizioni,' Padova, 1832. Among the most complete editions of Dante's poems are: that of Venice, 5 vols. 4to., 1757-8, with ample notes, and including Dante's Life, by Pelli, and his minor poems and prose works; Lombardi's edition, Rome, 3 vols. 4to., 1791; and that of Florence, with illustrative plates, 1819, 4 vols. fol. Among the numerous translations of the 'Divina Commedia,' in almost every language of Europe, that of Cary into English blank verse, and that of Wright into English triple-rhymes, in imitation of the original, are both excellent.

DANTON, GEORGE JACQUES, born at Arcis-sur-Aube, Oct. 26, 1759, was educated for the bar, and was pursuing the avocation of a king's counsel when the first shocks of the great political earthquake called him upon the revolutionary arena. Danton was tall and muscular, his features harsh and striking, and his voice resembled the roaring of breakers or the growling of the thunder. He was ambitious, bold, and eloquent. It is no wonder that such a man soon became the leader of popular commotions and the terror of all who dared to oppose him.

In 1790, supported by the revolutionary club of the Cordeliers, he presented to Louis XVI. a petition against the king's ministers, accusing them of having lost the confidence of the nation. In 1791 he was elected member of the departmental administration of the Seine. He was the prime mover of the popular assemblage of the Champ de Mars, in which he called for the dethronement of the king. On the 8th of August, 1791, he presented himself before the legislative assembly, and told the representatives of France that their refusal to declare the throne vacant would be the signal for a general insurrection. The fate of Louis was decided, and Danton, having been elected minister of justice, became the head of that body of six men who were intrusted with absolute executive power.

When the Prussian army had entered France, and consternation began to spread in all quarters, it was Danton who ascended the tribune, and addressed the convention in one of the most impassioned speeches ever uttered by a demagogue; he ended with these eventful words:—'The country is in danger; to avert the crisis one thing only is needful—boldness, incessant boldness, nothing but boldness.' These words acted like a spell upon the French nation. Within a few weeks fourteen republican armies stood upon the field of battle, and repelled with unexampled bravery the aggression of the allied forces.

After the abolition of royalty, Danton gave up the office of minister of justice for that of a president in the constituent committee and in that of Public Safety. He voted for the king's execution.

The rise of Robespierre was the fall of Danton. They were opposed to each other, and Danton stigmatised his rival as an 'ultra-revolutionist.' Failing however to overpower him, Danton withdrew to his native place, and, when summoned to give an account of his financial administration, he refused, unless his five colleagues were also compelled to do the same. Shortly afterwards St. Just denounced him as a traitor before the Comité de Salut Public, and Danton was arrested March 31, 1794, and beheaded the 5th of April of the same year.

(Lamartine, *Histoire des Girondins.*)

DANUBE, called by the Germans the *Donau*, and by the Hungarians the *Duna*, is a river of the first rank, and the second of European rivers, being inferior only to the Volga. Its course is calculated to be about 1770 miles, and the surface drained by it and its numerous tributaries probably exceeds 300,000 square miles.

In its long course from west to east it touches the extremes of 8° 10′ and 30° E. long., and those of 43° 40′ and 49° N. lat. Geographers have divided the course of the river into three parts.

Its upper course is through the hilly country about its source, the Bavarian plain, and the mountains which divide that plain from the plains of Hungary; the middle course extends from Vienna to the Demir Kapi, which divides the Hungarian from the Wallachian plain; and the lower course traverses the last-mentioned plain.

The Danube rises on the eastern slope of the Black Forest Mountains, about 24 miles from the banks of the Rhine, in 48° 6′ N. lat., and 8° 9′ E. long., at an elevation of about 3900 feet above the sea. It is here a mountain torrent, which is called Breghe. Near Donaueschingen it is joined by another mountain-stream, after which junction it receives the name of Donau, or Danube. From thence to Donauwörth it passes through or near Efferding and Ulm, receiving in its course the Iller, the Lech, and a few mountain streams. Through the Bavarian plain, from Donauwörth to Passau, it waters Neuburg, Ingoldstadt, Neustadt, Ratisbon, and Straubing, and receives the Altmühl, the Naab, and the Regen. The Ludwigs Canal, recently completed, crosses this part of the plain; it leaves the Danube at Kellheim and extends to Bamberg, where it joins the Regnitz, 3 miles above the junction of this river with the Main, thus connecting the Black Sea with the German Ocean. Between Passau and Vienna the Danube passes through Linz and several small Austrian towns, and receives the Traun, the Ens, and the Marosh. In the middle course, from Austria to Turkey, it passes through Vienna, Presburg, Pesth, and numerous smaller towns, to the mountain valley of the Demir Kapi (the Iron Gate), which is formed by the near approach of the offsets of the Carpathian and Balkan mountains; and it receives the waters of the Leitha, the Raab, the Waag, the Gran, the Drave, and some smaller rivers. In its lower course, from the Demir Kapi to its termination at the Black Sea, it nearly coincides with the southern boundaries of Wallachia; waters the towns of Widdin, Nikopolis, Sistova, Rustchuk, and Silistria; and receives the Aluta, the Sereth, the Pruth, and the Morava.

The height of the Danube above the sea is 1255 feet at Ulm, 1160 at Donauwörth, 1140 at Ingoldstadt, 1050 at Ratisbon, 800 at Passau, 650 at Linz, 421 at Vienna, 401 at Presburg, 348 at Pesth, 200 near the Demir Kapi. In many parts the river divides and unites again, so as to inclose islands. Other parts are so rapid that the navigation upwards is difficult. At the Demir Kapi there is a powerful rapid; near that spot are the remains of a bridge which was built by Trajan. Near its termination, the Danube divides into several branches, and flows into the Black Sea by seven mouths, viz. Kilia Bagasi, Suline Bagasi, Kedrille Bagasi, Salvoa Bagasi, Kutsuk Bagasi, Portesca Bagasi, and Kurte Bagasi. Suline Bagasi is considered as the principal mouth and is most navigated.

Steam navigation is established on the Danube. The voyage is divided into several *strecke* or portions—Donauwörth to Ratisbon, Ratisbon to Linz, Linz to Vienna, Vienna to Pesth, Pesth to Orsova. From Orsova, or rather from a station below it called Drenkova, to Skela Gladova, a distance of 54 miles, the river is not navigable except for light cutters, owing to the rapids, whirlpools, and dangerous ledges that occur in this interval. Passengers are conveyed between these stations in carriages along a splendid road cut in the rocks that line the river. The remaining portions of the voyage are from Gladova to Galaz, Galaz to Odessa, Galaz to Constantinople. In consequence of the melting of the snows the Danube rises from June to the middle of July, and does not begin to sink till the middle of August. This period is very favourable to the navigation of the river from the increased depth of water. From November to April the navigation of the Danube is shut in consequence of the ice; and during this interval the river is crossed at all points by carriages and foot passengers. The breaking up of the ice is sometimes attended with great loss of life, as it frequently takes place so rapidly that persons then on the river have not time to reach the bank. A sudden thaw of this kind, though it is always a cause of the greatest alarm to the inhabitants of the towns on the river, is described as a most magnificent phenomenon, the water bursting through the ice with an explosion like artillery, tossing vast masses of it into the air, and strewing icebergs of many tons' weight along the shore.

The Danube was known to the early Greek writers under the name of Istros (Ἴστρος), called by the Romans Ister, which was probably the genuine name of this river in the lower part of its course. The Romans learned the name Danubius from the natives on the upper course of the stream. Herodotus (iv. 48) and Strabo (p. 304, ed. Cas.), give descriptions of the river.

(Hoffmann's *Deutschland und seine Bewohner;* Berghaus, *Annalen;* Murray's *Hand-book of South Germany.*)

DANZIG, one of the 4 administrative circles of the province of West Prussia, extends nearly 100 miles along the Baltic, and is bounded N. by the Gulf of Danzig, E. by the circle of Königsberg, W. by Pomerania, and S. by the circle of Marienwerder. Its area is 3222 square miles, and the population in 1843 was 387,306. The surface is mostly level, with a gradual slope from the banks of the Vistula to the Baltic. The soil is in many parts sandy and swampy; but in general it is productive, and along the Vistula exuberantly fertile. The produce consists of great quantities of grain, vegetables, and fruit. The circle contains about 800,000 acres of woods and forests. The rearing of horses and cattle, and the fisheries along the coast, afford profitable occupation to a large portion of the inhabitants. Amber is obtained on the shore in the vicinity of Danzig. The principal rivers are the Vistula, Schwente, Sorge (which takes the name of Elbing before it falls into the Frische Haff), Thiene, and Motlau.

The chief manufactures are woollens, linen, leather, beer, and spirits. A very extensive trade is carried on with foreign parts from the ports of Danzig and Elbing.

The circle of Danzig is subdivided into 7 districts which are named from the chief town in each. These towns are—Danzig: *Neustadt*, 20 miles

N.N.W. from Danzig, with about 2000 inhabitants: *Karthaus*, a small place W. of Danzig: *Elbing*, a large commercial and manufacturing town on the river Elbing, which is joined to the Nogat by a canal; the town, which is surrounded by turreted walls and ditches, consists of an old and a new town, with three suburbs within the walls, and 11 outside; it contains 7 churches, one of which is Catholic, 1 synagogue, an exchange, bank, bonding warehouses, a gymnasium, savings' bank, sugar refineries, several schools and asylums, and a population (including the suburbs) of 23,000; tobacco, sailcloth, soap, hosiery, linen, oil, &c., are manufactured; there are also tanyards, and ship-building yards; the chief exports are corn, hemp, flax, staves, timber, butter, and wool; about 26 sea-going vessels, besides a great number of small craft, belong to the town, which has a large transit trade with Pillau, at the entrance of the Frische Haff: *Marienburg*, on the right bank of the Nogat, which is here crossed by a pontoon bridge 546 feet long; the town is surrounded by a rampart, and contains a fine palace which was once the seat of the Grand Master of the Teutonic Order, and was restored by the present King of Prussia, several breweries, distilleries, tanyards, cotton and woollen factories, and about 6000 inhabitants, who export corn, fish, timber, quills, bristles, &c.: *Stargard*, S. of Danzig, on the Ferse, which has distilleries, breweries, tanyards, and about 4000 inhabitants: and *Behrendt*, in the western part of the circle, near the source of the Ferse, which has about 2000 inhabitants.

DANZIG or GDANSK, formerly one of the most considerable cities of the Hanseatic league, and now the capital of the circle of Danzig, stands on the left bank of the principal arm of the Vistula, and about 3 miles from its mouth in the Gulf of Danzig, in 54° 21′ N. lat. 18° 38′ E. long., and has 62,000 inhabitants. It is surrounded with walls, entered by four gates, and is considered one of the strongest fortresses, and one of the most flourishing towns, in Prussia. The town owes its commerce and prosperity to its harbour, and to the extensive inland navigation afforded by the Vistula and its numerous tributaries, by which the corn, timber, and other products of Poland and the Ukraine are conveyed to Danzig. The town is traversed by the Radaune and Motlau, feeders of the Vistula. The Motlau is deep enough within the town to float vessels of 8 or 9 feet draught, and between the lower part of it and the Vistula, there is a harbour for larger vessels. By the mouth of the Vistula only small vessels can enter as it is made shallow by sandbars; but by a canal cut across a neck of land directly into the gulf, and having a breadth of 120 to 180 feet, with a depth of 15 feet, large vessels can go quite up to the town. The entrance to the canal is protected by piers that run out for about 500 yards into the gulf, in which there is excellent anchorage, good holding ground, and shelter against all winds except the north-east and east.

Many parts of the town are in a fine old style of building, though not regularly laid out; but a great number of the streets are narrow and crooked. There are 21 churches in all, 13 of which are Lutheran, 4 Reformed-Lutheran, and 4 Roman Catholic. St. Mary's, one of the Lutheran churches is a remarkable structure, ornamented with 10 small towers, and surmounted by a lofty steeple; the roof is supported on 28 columns, and the interior which contains 19 altars, is lighted by a great number of windows. There are also 2 Mennonite places of worship, 2 synagogues, 3 monasteries, and a convent, in the town. Danzig has a royal school of navigation; a gymnasium with 7 professors, and a library of 30,000 volumes; and a great number of endowed schools. It has a board of trade and navigation, a tribunal of commerce, a humane society, public library, 4 hospitals, an observatory, and various other literary, scientific, and philanthropic establishments. There are yards and slips for ship-building; sugar refineries, spirit and liqueur distilleries, breweries, copperworks, and manufactories of silks, woollens, linens, leathers, hats, and gloves, soap, and starch, earthenware, arms, steel-ware, hats, tobacco, &c. The town has a very considerable export trade, consisting of corn, timber, flour, linseed, rapeseed, deals, staves, ashes, quills, spirits, black beer, spelter, wool, flax, hemp, &c. The imports are composed of wine, brandy, rum, raw cotton, coffee, herrings, iron and steel wares, indigo, lime and plaster, sugar, salt, tobacco, &c. The gross value of the imports in 1839 was 380,213*l.*, and in 1840, 380,280*l.*; about one-fourth of the imports in value are brought from England. The gross value of the exports in 1839, was 1,584,025*l.*, of which England paid 1,264,866*l.*; in 1840 the value of the exports amounted to 1,793,722*l.*, of which England paid 1,288,858*l.* The wheat exported in 1840 was valued at 1,179,252*l.*

(Macgregor's *Statistics;* M'Culloch's *Commercial Dictionary.*)

DAPHNE, a genus of thymelaceous plants, containing many species, inhabiting the more temperate parts of Europe and Asia.

D. mezereum, the Mezereon of the gardens, is found wild in the mountainous woods of many parts of the middle and south of Europe. It is met with in woods in various counties of England. The berries are smooth, shining, and bright red. All the parts of this and indeed of the other species, as far as they have been examined, are extremely acrid and poisonous. If the bark is bruised and applied to the skin, it produces severe blisters, and is sometimes substituted for cantharides when that drug cannot be employed with safety. Taken internally, the bark, leaves, and fruit act as cathartics, but require to be administered with extreme caution; for they are apt to produce dangerous and even fatal consequences.

D. laureola, the Spurge Laurel, is another British species, found wild commonly in woods and hedges. An ointment for keeping open blisters is prepared from this plant. *D. pontica*, one of the plants which is reputed to have contributed to the poisonous quality of the honey that was eaten by Xenophon's soldiers, is very like this species, and is often cultivated as a hardy evergreen. *D. Gnidium*, the Garou Bush, will not live in the open air in England, except in

the warmest counties. Both the berries and leaves are employed by the French as purgatives; the plant also affords a good yellow die. *D. cneorum* is a native of grassy places in the Alps of Switzerland and the rest of central Europe. *D. collina, Alpina, Neapolitana,* and *tarton-raira* are other species cultivated in gardens. The first has dull purple sweet-scented flowers, and is sufficiently common in collections; the others are rarer.

In addition to the acrid and dangerous properties which appear to be common to them all, some species are remarkable for the toughness of their fibre, and for the economical purposes to which they are applied. From *D. cannabina* is prepared a kind of writing-paper in China.

D. lagetta, the Lace-Bark Tree of Jamaica, is most remarkable for the tenacity of the fibre of which its bark consists, and for the facility with which it may first be separated into thin layers and then into distinct meshes. If the inner bark of this plant be macerated in water, it may be readily separated into layers no thicker than the finest lace, and which, after having been pulled a little sideways, resemble in some measure that fabric. King Charles II. is said to have had a cravat, frill, and ruffles of lace-bark presented to him by his governor of Jamaica.

DAPHNIN, a peculiar acrid principle found by Vauquelin in the *Daphne Mezereum.*

DAPTUS (Fischer), a genus of coleopterous insects of the family *Harpalidæ* (*Famille des Carnassiers*). (*Règne Animal,* vol. iv. p. 389.)

DARABGHERD. [FARSISTAN; PERSIA.]

D'ARBLAY, MADAME, originally Miss *Frances Burney,* was born at Lynn-Regis, 13th June, 1752, and was second daughter of Charles Burney, Mus. Doc., the author of the 'History of Music.' Madame D'Arblay has given her own account of her early life in her 'Memoirs' of her father, from which it appears that, though backward in learning when a child, she very early began to exercise herself in works of fiction, tales, and poetry. At fifteen she burned all her early performances; but one of them, the 'History of Caroline Evelyn,' kept possession, she says, of her memory and fancy, and gave rise to her first published work, 'Evelina; or, the History of a Young Lady's Introduction to the World.' It used to be generally understood, and has been repeatedly stated, that Miss Burney was only about seventeen when this her first novel appeared. The fact is, that it was published in the year 1778, when she was twenty-six. The work was successful far beyond its real merits, and made considerable noise in the world. Her second novel, 'Cecilia, or the Memoirs of an Heiress,' appeared in 1782. It is in five volumes, and is a considerable improvement upon 'Evelina.' In July 1786, she was appointed one of the Dressers or Keepers of the Robes to Queen Charlotte, and this situation she held for five years. In July 1793, she married M. Alexandre Piochard D'Arblay, a French emigrant artillery officer; and in 1796 she produced another five-volume novel, 'Camilla, or a Picture of Youth.' After the peace of Amiens, in 1802, her husband and she went to Paris; and, M. D'Arblay having given in his adhesion to the existing government, they remained in France. In 1812, however, Madame D'Arblay found means to pass over to her own country; and she had thus the satisfaction of again seeing her father, who survived till 1814, when he died at the age of eighty-seven. Her husband, now General D'Arblay, joined her at the peace; and they resided together till his death at Bath in May. 1818. Meanwhile she had, in 1814, published her fourth and last novel, 'The Wanderer, or Female Difficulties,' in 5 vols.; but it met with little success, and is considered the poorest of her performances. In 1832 she published three 8vo. volumes of 'Memoirs' of her father, Dr. Burney, which contain many interesting anecdotes, but related in a pompous drawling style, totally unlike her previous productions. In 1837 Madame D'Arblay lost her son, the only issue of her marriage, the Rev. Alexander Charles Louis D'Arblay; he was a fellow of Christ's College, Cambridge, and perpetual curate of Camden Town Chapel, and he had published several single sermons. Her own death followed at Bath on the 6th of January, 1840. Since then her 'Diary and Letters,' edited by her Niece, have been printed, which, though much of it is frivolous enough, is on the whole an extremely curious record; and the account which it presents of some departments of English life and society in the latter part of the last century is the amplest and most distinct that has any where been given.

DARDANELLES, fortifications erected on both sides of the Strait anciently called the Hellespont, which from them takes the name of the Strait of the Dardanelles. This strait, which divides Europe from Asia, and unites the Sea of Marmara to the Archipelago, extends in a south-west direction between 26° and 27° E. long., and between 40° and 40° 30′ N. lat. Its length is upwards of 50 miles, and its width south of Gallipoli is generally about two miles. Towards the southern extremity, however, it narrows at some places to one mile and less. A strong current runs always through it from the Sea of Marmara to the Archipelago.

The fortifications originally consisted of four castles, two in Europe and two in Asia. Two, called the New Castles, are at the southern entrance of the strait; and two, called the Old Castles, about 18 miles further to the N.E. But the name Dardanelles is now especially applied to some fortifications erected in modern times between the New and the Old Castles, but nearer the latter. The number of guns mounted in all these fortifications and some others of less importance is 689, besides 8 mortars. Among them are several immense guns, from which stone shot are discharged. The quantity of powder which these large guns require is enormous: the largest is charged with 330 lbs.

DAR-FUR, a country in Africa, between Bornou and Abyssinia, lying between 11° and 16° N. lat., and between 26° and 30° E. long. It may be considered as a large oasis, placed in the south-eastern corner of the Sahara, and divided by deserts from Dar Berghami on the west, and from Kordofân on the east. The southern part

of the country is hilly, and contains valleys with brooks and rivulets which have water all the year round. But the northern part is a level country, partly covered with sand, and in other places by rocks: water is only obtained from wells. The climate and productions nearly resemble those of Bornou. The population consists mostly of the descendants of emigrants from the countries along the banks of the Nile, especially Dóngola, Sennaar, and Kordofân. Among them are also some families from Egypt, Tunis, and Tripolis. They use the language of Barabra, though they also speak Arabic. Arabs are also numerous in some parts. The chief town, Cobbe, is a long straggling place, whence caravans depart for Egypt, with which Dar-Fur carries on some trade. (Browne's *Travels in Africa.*)

DARIC, a Persian coin of pure gold, stamped on one side with the figure of an archer crowned, and kneeling upon one knee, upon the other with a deep cleft. Wesseling and other writers, upon the authority of Herodotus, suppose that it was first struck by Darius Hystaspes, the father of Xerxes, who began his reign B.C. 521. The daric was equivalent in value to twenty Attic drachmæ of silver. There are three darics in the British Museum, weighing about 128½ grains each.

The silver coins which go by the name of darics are miscalled. They had no such designation in ancient times. The earliest of them, if we may rely upon Herodotus in a passage often referred to (iv. 166), were struck by Aryandes, the Persian governor of Egypt, in imitation of the darics. Eight specimens of this description are in the British Museum. They are generally considered as ancient Persian coins, and are commonly, though without any assignable reason, except as bearing the figure of an archer, called Darics.

Silver Daric. British Museum. Actual Size.

DARIEN, the GULF of, the most southern portion of the Caribbean Sea, extends from 7° 56′ to 10° N. lat., between 76° and 78° W. long. Its most southern recess, called the Bay of Candelaria, forms a spacious harbour capable of containing all the fleets in the world, and has a good anchorage of from 18 to 30 fathoms deep, sheltered against every wind, and only subject to a strong sea when north winds prevail. [Panama.]

DARIEN, ISTHMUS OF. [Panama.]

DARI'US I., the son of Hystaspes, ascended the throne B.C. 521, after having, with six other conspirators, despatched the usurper Smerdis. It was agreed among them that they should assemble early one morning before sunrise on horseback, and that he whose horse neighed first to the rising sun should be king: the horse of Darius neighed first, and he was saluted king. (Herodotus, iii. 84–87.)

Darius divided his vast empire into 20 satrapies or provinces, and appointed a fixed tribute to be paid, as well as a regular supply to be sent for the provisions of the army and the king's household. A system of communication between different parts of the empire was established by means of couriers stationed at certain distances for the transmission of the royal messages. In this reign the Babylonians revolted, and made great preparations for resistance. Darius besieged them for a year and eight months, but without success, till the artifice of Zopyrus put him in possession of the city. Zopyrus, one of the officers of Darius, after cutting off his own nose and ears, and lacerating his body, went over to the enemy, telling them that this was the treatment he had got from Darius, and he had therefore come over to them that he might aid in taking revenge on the tyrant. The Babylonians received him gladly, and soon intrusted to him the whole city, which he delivered up to Darius. One of the principal events in his reign was his expedition against the Scythians north of the Danube, but he had no success, and great difficulty in effecting his escape. He left Megabazus in Thrace, who subdued the Pæonians.

In B.C. 501 some disturbances arose in the island of Naxos, which ended in the aristocratical party being obliged to quit the country. They applied to Aristágoras, a Greek, and governor of Miletus, who communicated the scheme to Artaphernes, the king's brother and governor of Sardis. After obtaining the king's consent, Artaphernes intrusted a fleet of two hundred ships to Megabátes, a Persian, and ordered it to sail to Miletus to take on board the forces of Aristagoras. After a four months' siege their funds were consumed, and Aristagoras had contracted a debt with the Persian government which he could not pay. An insurrection of the Ionian states, whom he excited to revolt, followed, and ended in the fall of Miletus B.C. 494.

As the Athenians had given Aristagoras aid in the revolt, Darius sent, under the command of Datis and Artaphernes, an army to Attica, which was defeated by Miltiades in the plain of Marathon B.C. 490. [Marathon.] The conquered Persians returned to Asia. Darius began to make preparations for another expedition against the Greeks, as well as the rebellious Egyptians, but he died B.C. 485, before the commencement of the war. He appointed his son Xerxes his successor.

DARIUS II., called Darius Ochus or Nothus, because he was the illegitimate son of Artaxerxes. Soon after the murder of Xerxes II., Darius deposed Sogdianus, and ascended the throne B.C. 423. By his wife Parýsatis he had Artaxerxes Mnemon and Cyrus the Younger. He died B.C. 404, and was succeeded by his son Artaxerxes.

DARIUS III., or Codomannus, the last of the Persian monarchs, succeeded Artaxerxes III. B.C. 336. In the second year of Darius's reign, Alexander of Macedonia passed over the Hellespont

into Asia: he pursued his march to the river Granicus (now the Oostvola), where he gained his first victory over the Persians. Another battle was fought at Issus, in Cilicia, where Darius took the command and was defeated. He engaged in person again in a battle at Gaugaméla, commonly called the battle of Arbela, and was defeated. After the battle of Issus, the wife, mother, and children of Darius came into the hands of Alexander, who treated them with the utmost consideration and care. Darius took refuge in Ecbátana, but he was seized by Bessus, the governor of Bactria. The traitor with his prisoner fled before Alexander, who hastened the pursuit till he came in sight of them, when Bessus and his companions pierced Darius with their darts. The Macedonians found him just alive. Alexander took off his own cloak and spread it over the corpse, which he ordered to be embalmed and sent in a splendid coffin to Sisigambis, the wife of Darius, to be interred with the other monarchs of Persia. Darius died B.C. 330, in the fiftieth year of his age. He had the reputation of a just and humane prince. With Darius ended the empire of Persia, which had lasted for upwards of two hundred years under thirteen kings. (Diodorus Siculus, xvii. 5-77; Plutarch, *Alexander*.) [ALEXANDER III.]

DARLINGTON. [DURHAM.]

DARMSTADT, the capital of the grand duchy of Hesse Darmstadt, stands on the Darm, about 10 miles E. from the Rhine, 17 by railway S. from Frankfort-am-Main, in 49° 52′ N. lat., 8° 37′ E. long., and has 22,500 inhabitants. It is divided into an old and new town; the former is inclosed within old massive walls, and has a gloomy, uninteresting appearance; the new town, however, although similarly defended is built in better style, has broad, clean, and well-lighted streets, and handsome houses. The town has six gates and five public squares. The principal public buildings are—the new palace, in which the Grand Duke resides; the old palace, which contains a large gallery of paintings, a fine museum of natural history, and a public library of 200,000 volumes; the Exercier-Haus, or riding-school; a very handsome opera-house; an arsenal; barracks; the town church, containing the ducal vaults; and the Roman Catholic church, which is a handsome circular structure on an eminence, with a splendid dome, supported by twenty-eight large columns. There is a gymnasium, a training-school, and various other schools in the town. There are a few manufactures of woollens and linens: the inhabitants are mainly dependent for support upon the expenditure of the court and the garrison; many of them however are engaged in tanning, gardening, &c. The environs are very picturesque, and the soil is highly cultivated.

DARNETAL. [SEINE-INFÉRIEURE.]

DARNIS, a genus of insects of the order *Hemiptera* and family *Cercopidæ*. [CICADELLA.]

DARTFORD. [KENT.]

DARTMOUTH. [DEVONSHIRE.]

DARWAZ is a country in Asia in the valley of the river Oxus, situated north of its course, between 37° and 38° N. lat., and between 69° and 71° E. long. Its extent northward is imperfectly known, as it borders there on the almost unknown country of Karategein. On the east of it are Shagnan and Roshan, and on the south Badakshan. It is an Alpine country, consisting of a succession of high mountains and narrow valleys; the mountains are so difficult of access, that the communication between the valleys can only be effected by paths which do not admit of animals of burden of any kind. Cotton is cultivated, and is made into cloth by the inhabitants, who export it, and receive in return grain and gunpowder. A small number of cattle are kept, and sheep and goats are numerous. There are few horses. The natives of this country are Tajiks, and most of them Sooni Mohammedans. Their language is Persian.

DARWIN, ERASMUS, an English physician and physiologist, was born at Elton, near Newark, on the 12th December, 1731. After studying at St. John's College, Cambridge, and taking the degree of doctor of medicine at Edinburgh, he established himself as a physician at Lichfield, where he married, and resided till after the death of his first wife, by whom he had three sons. In the year 1781, having again married, he removed to Derby, where he died on the 18th of April, 1802, in the 70th year of his age. He is said to have been a man of an athletic person, and of temperate habits, the advantage of which he lost no opportunity of pointing out to those over whom his influence extended. His biographers give him credit for having done much service to the poor of Lichfield in this respect.

Dr. Darwin published in 1781 his 'Botanic Garden,' a poem in two books; in 1793, his 'Zoonomia, or Laws of Organic Life,' which was succeeded in 1796 by a continuation of the subject, the whole forming 2 vols. 4to.; and in 1800, his 'Phytologia,' or Philosophy of Agriculture and Gardening, in 1 vol. 4to., of rather more than 600 pages. All these works have excited considerable attention; by some they have been extravagantly praised, by others as unreasonably depreciated, and at the present day they are little read or consulted. Nevertheless, they are far from deserving to sink into neglect and oblivion. This author was unquestionably a man of a highly original turn of mind; he was unusually well read in the physics of his day; he had a singular aptitude for seizing and illustrating natural analogies, and above all he was fully impressed with a sense of the important truths of a universal simplicity and harmony of design throughout the whole creation. While however we thus give Darwin credit for a rank in science that has hardly been accorded to him before, we are bound to add that his errors were neither few nor unimportant. He was too fond of tracing analogies between dissimilar objects; he readily adopted the ingenious views of others without sufficient inquiry; he had the great fault of being often a credulous collector and a fanciful reasoner; and his prose writings are often inexcusably inelegant, ill arranged, and ungrammatical.

DATA, DATUM. A datum is any quantity,

condition, or other mathematical premiss which is given in a particular problem. Thus, in the question 'to draw a circle which shall have its centre in a given line, and shall touch two other straight lines,' the data are as follows: 1, That the figure described is to be a circle; 2, a certain straight line; 3, that the centre of the circle is to be on that straight line; 4, two other straight lines; 5, that the circle is to touch those straight lines.

The book of Euclid, known by the name of Data, is the deduction of magnitudes from other magnitudes, not as to what they are, but as to whether they are determined or not. Thus one of the propositions is, 'If a given magnitude be cut in a given ratio, the segments are given.'

DATISCA'CEÆ, a small natural order of plants allied to *Urticaceæ*. *Datisca cannabina*, the commonest plant of the order, is a native of the southern parts of Europe, where, especially in Candia, it is used on account of its bitter tonic properties as a substitute for Peruvian Bark. It also affords a yellow die.

DATU'RA, a genus of solanaceous plants. Several species of this genus are known in cultivation, the very large size of their funnel-shaped flowers rendering them conspicuous objects; they have however a nauseous odour, and are only handsome when in flower, for which reason they are not general favourites. They are all exotics, with the exception of

D. Stramonium, the Thorn-Apple, which is by no means an uncommon annual upon dunghills, rubbish heaps, and waste places near houses. It grows about three feet high, with a light green stiff stout stem, which is slightly downy near the upper end.

This plant is well known, under the name of *Stramonium*, as a powerful and dangerous narcotic. Its leaves and seeds are the parts employed, and they are found to possess properties similar to those of henbane and belladonna. The leaves are occasionally smoked, especially by country people, as a remedy for asthma. The seeds, in small doses, produce symptoms of frenzy; in larger quantities, stupor and death. The poisonous principle of this and other species is considered a peculiar vegetable alkali, and called *Daturine*.

Datura arborea and *D. bicolor* are beautiful arborescent South American plants. The former with long white flowers, and the latter with yellow or scarlet ones, are noble objects in the gardens of this country.

DAUBENTON, LOUIS JEAN MARIE, a justly celebrated naturalist and zootomist, born at Montbard in Burgundy, on the 29th of May, 1716. The church was his destination, and he was sent to Paris to study theology; but he gave in secret those hours to medicine and anatomy which his father hoped he was devoting to ecclesiastical reading. The death of this parent left him at liberty to follow the path he loved; and, having taken his degrees at Rheims, he returned to Montbard, for the purpose of exercising his profession. But there was a kindred spirit that, happily for zoology, had been connected from infancy with Daubenton. The Comte de Buffon, born at the same place, knew him well in youth, and when, in after-life, Buffon was appointed Intendant of the Jardin du Roi, his thoughts reverted to Daubenton as the person of all others qualified by his zeal and ability to prosecute those anatomical inquiries, the details of which his own feebleness of sight prevented him from investigating. The Count drew Daubenton to Paris in 1742, and in 1745 the office of Curator and Demonstrator of the Cabinet of Natural History was conferred upon a man eminently fitted by his quick discernment, his untiring diligence, and his inexhaustible patience, to fill the situation with the greatest possible advantage to the public. No one can open the 'Histoire Naturelle des Animaux' without being struck by the multitude and justness of the facts (for he carefully avoided all theory) with which Daubenton enriched that work, and in some degree corrected the fervid imagination of his brilliant coadjutor. But he did this without presuming in the least to draw general inferences: he confined himself strictly to facts; and such was his modesty, that Camper used to say of him that he himself was not aware of the discoveries which he had made. His valuable labours adorned the first fifteen volumes of Buffon's great work in 4to.; and the editions in which this essential part of the publication is wanting are justly considered as deprived of their fairest proportions. But Buffon in an evil hour suffered his ear to drink the intoxicating poison of fawning flatterers, and published a little edition (in 12mo.), of which Daubenton's labours formed no part. The hint was more than sufficient for the modest Daubenton, and from that time the assistance of Guéneau de Montbeillard and of Bexon in the ornithological department but ill supplied the exquisite dissections and demonstrations which had rendered the former part of the work so highly valuable to the physiologist. For fifty years did Daubenton labour without cessation in enriching and arranging the magnificent collection committed to his charge. He is said to have been the first professor of natural history who gave lectures by public authority in France, one of the chairs of the College of Medicine having been converted into a chair of natural history at his request: it was conferred on him in 1778. The Convention having elevated the Jardin du Roi into a public school, under the title of the Museum of Natural History, he was named Professor of Mineralogy, and retained the professorship as long as he lived. In 1783 he became Professor of Rural Economy at Alfort, and gave lessons in natural history at the normal school in 1795. To him France in a great measure owes the introduction and successful propagation of the breed of Spanish sheep. In 1799 he was elected a member of the senate; and the alteration in his habits caused by this new dignity is supposed to have hastened his death, which took place after an apoplectic attack of four days' duration, in the night of Dec. 31, 1799, when he was nearly 84 years of age.

Daubenton's life, with the exception of the cloud that came between him and Buffon, raised by the weakness of the latter, was a happy one. His hours were spent in pursuits that were dear

to him; he was universally respected and beloved, for he was as amiable as he was learned; and his simple habits gave him, notwithstanding his natural weakness of constitution, a long life. Daubenton was married to the authoress of 'Zélie dans le Desert,' and, though his union was in other respects most happy, he left no children.

Lacépède, Cuvier, and Moreau de la Sarte have justly eulogised this good and great man.

Notwithstanding his incessant occupation at the Museum, he found time to publish much in addition to his writings in the 'Histoire Naturelle.' He was a contributor to the first Encyclopédie, and many of his papers on the natural history of animals and on minerals are to be found in the 'Mémoires de l'Academie des Sciences,' from 1754 to 1764. Two of his most interesting papers (though all are good) are those of 1762, on fossil bones pretended to be those of a giant, but which Daubenton referred to their true species, and of 1764, on the essential differences between man and the orang outang. His 'Instruction pour les Bergers,' 1 vol. 8vo., Paris, 1782, his 'Tableau Méthodique des Minéraux,' 1784, 8vo., and his 'Mémoire sur le premier Drap de Laine Superfine du Cru de France,' which also appeared in 8vo. in 1784, ought not to be forgotten in making a collection of his works.

(*Biographie Universelle*, &c.)

DAUCUS, a rather large genus of umbelliferous plants. The only species to which general interest attaches is the *Daucus Carota*. This plant, which grows wild all over Europe in chalky soil, is believed to be the origin of our garden carrot; but there is no record of its having first begun to change its hard wiry juiceless wild root for the nutritious succulent carrot of the gardens. For medical purposes the root of the cultivated plant, and the fruit of the wild plant, are used. The former, rasped down into a fine pulp, is sometimes applied raw to chapped nipples, and even cancerous ulcers; but more commonly it is boiled, and beaten into a uniform mass, and applied as a poultice to fetid, sloughing, and other ill-conditioned sores, which it cleanses and otherwise improves.

The root of the wild carrot is said to produce injurious effects, and should be avoided.

The cultivated carrot, particularly the yellow kind, contains in the root a large quantity of starch. This is greatest when it is raised on unmanured ground, exactly as wheat when raised on undunged ground has more starch and less gluten than when manured. The quantity in the carrot seems greatest about the end of September.

DAUDIN, FRANÇOIS MARIE, the son of a receiver-general of finance, was born at Paris towards the close of the eighteenth century. Nearly deprived of the use of his limbs by natural infirmity, he early devoted himself to the study of the sciences, and more particularly to natural history. His memoirs soon found their way into the 'Magasin Encyclopédique' and the 'Annales du Muséum d'Histoire Naturelle,' and he contributed some articles to the 'Dictionnaire des Sciences Naturelles.' His two principal works are his 'Traité d'Ornithologie,' which was never finished, and his 'Histoire Naturelle des Reptiles.' For the first much cannot be said: it is on the second that his fame will rest. Cuvier speaks of the latter as the most complete work on that class of animals which had hitherto appeared. His wife, who is represented as amiable both in mind and person, and as having actively assisted in the composition and illustration of his works, died of consumption; and poor Daudin, whose life, as well as that of his partner, had been long embittered by the deranged state of his affairs, followed her in a few days, before he had attained thirty years of age. He died in 1804, and left no children. (*Biogr. Universelle*, &c.)

DAUNII. [APULIA.]

DAUPHI'N, the title given to the eldest son of the King of France under the Valois and Bourbon dynasties. The last who bore it was the Duc d'Angoulême, son of Charles X.

DAUPHINE', a province of France, constituting, with the principality of Orange, one of the thirty-two military governments into which that kingdom was divided before the Revolution. It now forms the departments of DRÔME, HAUTES-ALPES, and ISE'RE. This country was inhabited in ancient times by the Allóbroges, the Caturiges, and other Celtic nations. In 734 it was invaded by the Saracens, who were expelled by Charles Martel. In the 9th century it formed part of the kingdom of Arles, and was governed by its own counts, who took the title of Dauphins, until 1343, when Count Humbert II. seeing himself without heirs, sold his states for 100,000 gold florins to Philippe, eldest son of King Philippe of Valois, on condition that the eldest son of the kings of France should thenceforth for ever bear the title of *Dauphin*. Dauphiné was about 124 miles long and 100 broad; it was bounded N. and W. by the Rhone, E. by the Alps, and S. by Provence. Grenoble, Gap, Embrun, Briançon, Vienne, and Valence were its chief towns. (Chappuys-Montlaville, *Histoire du Dauphiné; Dictionnaire de la France.*)

DAVENANT, WILLIAM, was born at Oxford in 1605. His father kept the Crown Inn there, and he was entered at Lincoln College, Oxford; but it does not appear that he took a degree. In 1637 he succeeded Ben Jonson as laureat; and in 1641 the measures of the parliament forced him to retire to France. In 1643 he was knighted by Charles at Gloucester; but in 1646 we find him again in France, a Roman Catholic, and in the employ of Henrietta. Being taken prisoner at sea in 1651, he only escaped being tried for his life by the intercession of some friends. His works consist of dramas, masques, addresses, and an unfinished epic called Gondibert, which he dedicates to Hobbes; but the work by which he is best known is the wretched distortion of Shakspere's 'Tempest,' in which he was engaged with Dryden, and which long kept possession of the stage. Sir William Davenant died in 1668, and was buried in Westminster Abbey.

DAVENANT, CHARLES, a writer on politics, political economy, and finance, was born in 1656, and was the eldest son of Sir William Davenant, the poet. He studied at Baliol College, Oxford, and first made himself known by a

dramatic piece, entitled 'Circe,' a tragedy, and which was brought out in 1675, but not printed till 1677. Davenant, in 1683, became one of the commissioners of excise, in 1685 he was made inspector of plays, and in 1703 inspector of exports and imports. He sat in parliament for St. Ives and Bedwin, in the years 1695, 1698, and 1700. Davenant died, Nov. 14, 1714.

Davenant's publications on commerce, finance, and politics range over a period of about eighteen years. Among the more remarkable are :—'An Essay upon Ways and Means of Supplying the War,' 1695. This tract immediately gained him considerable reputation for an acquaintance with the subject of the public finances. 'Discourses on the Public Revenues, and of the Trade of England,' part i., 1698; and part ii., containing the Discourses 'which more immediately treat of the Foreign Trade of this Kingdom,' also 1698. Most of the others were political and on the Tory side. A selection of them was published in 1771, in five vols. 8vo., by Sir Charles Whitworth, afterwards Earl Whitworth.

DAVENTRY. [NORTHAMPTONSHIRE.]

DAVID. [PSALMS.]

DAVID, JACQUES LOUIS, was born at Paris in 1750. In 1774 he went to Rome to study; he returned to France ten years afterwards, and attained considerable reputation, both as an historical and portrait painter. Upon the breaking out of the Revolution he took an active part through its whole course. In 1815 he was banished from France with those who had voted for the death of Louis XVI., and took up his abode in Brussels, where he died December 29, 1825. David's style is a servile imitation of the Greek sculptures; his figures are like statues coloured and put in motion; his drawing is correct, and his composition classical; but his design is constrained and artificial, with a hard outline and harsh colour. The 'Rape of the Sabines' is considered one of the best of his works, which are chiefly at Paris. His portrait of Napoleon is well known.

DAVID'S, ST. [PEMBROKESHIRE.]

DA'VILA, HENRI'CO CATERI'NO, born in 1576, at Pieve di Sacco near Padua, was the son of Antonio Davila, constable of Cyprus in 1571. When Henrico was seven years old, his father took him to France for his education. At the age of eighteen he entered the army of Henri IV., in which he served four years, and was wounded at the siege of Honfleur. In 1599 he returned to Pieve di Sacco, and not long afterwards entered the military service of Venice, and was employed successively in Candia, Friuli, Dalmatia, and other stations. In 1631 he was sent to take the command of the garrison of Crema, and, falling into a quarrel with a postmaster on his route, the postmaster fired a pistol, and shot Davila dead in sight of his wife and children.

Davila is known to the world through his History of the Civil Wars in France, 'Storia delle Guerre Civili di Francia,' from the death of Henri II. to the peace of Vervins in 1598, a period of forty years most eventful in the history of that country. He treads, therefore, upon the same ground as De Thou in his 'Historia sui Temporis.' Some critics have noticed that Davila evinces a partiality for the French court, and especially for Catherine de Medicis, who had been his father's benefactress. By common consent Davila is numbered among the best historical writers of Italy. His work has gone through many editions, and has been translated into several languages.

DAVIS, JOHN, was born at Sandridge, near Dartmouth, in Devonshire, and distinguished himself by three voyages for the discovery of a north-west passage, which he undertook between 1585 and 1587. He discovered the strait which bears his name, and sailed along the coast of Greenland as far as 72° N. lat., but was not able to approach the opposite coast, on account of the numerous icebergs which lined it north of the Polar Circle. He afterwards made five voyages to the East Indies, and was killed in the last (1605) in the Strait of Malacca. He published an account of his second voyage to the north-west, and of one to the East Indies.

DAVIS'S STRAIT unites Baffin's Bay to the Atlantic. Navigators commonly understand by this name the sea extending W. of Greenland from Cape Farewell to Disco Island. Its narrowest part is near the Polar Circle, where it is about 200 miles across. It is the principal resort of the whalers, the fish being very numerous here. But the immense icebergs, and the violence of the Arctic currents, render the navigation of the strait very dangerous. [ATLANTIC OCEAN; BAFFIN'S BAY.]

DAVISON, Secretary. [ELIZABETH.]

DAVY, SIR HUMPHRY, was born at Penzance, in Cornwall, Dec. 17, 1778. His father was a carver in wood. He does not appear to have been fortunately placed at school in the first instance; but he was afterwards, till he was fifteen years of age, with Dr. Cardew, whose school he quitted in 1793. In the year 1795 he was apprenticed to Mr. Borlase, a surgeon and apothecary of Penzance, where he appears to have laid down an extensive plan of study, not merely of the sciences which related to his profession, but the learned languages, mathematics, history, &c. In 1798 he was considered competent by Dr. Beddoes to take charge of an establishment which he had founded at Bristol under the name of the Pneumatic Institution. In the following year he produced 'Essays on Heat, Light, Respiration,' and other subjects, which were remarkable rather for bold and original speculations than for sound doctrines. In 1800 he published, in one volume 8vo., a work entitled 'Researches, Chemical and Philosophical, chiefly concerning Nitrous Oxide and its Respiration,' in which he detailed some highly interesting experiments, which had been somewhat hazardous to himself, on the inhalation of various gases.

In 1801 Davy came to London, and on the 25th of April he gave his first lecture at the Royal Institution. He began with the history of galvanism, detailed the successive discoveries, and described the different methods of accumulating it; and on the 31st of May, 1802, he was appointed professor. From the year 1800 to 1807 a great

variety of subjects attracted his attention, especially galvanism and electro-chemical science; the examination of astringent vegetable matter in connection with the art of tanning; and the analysis of rocks and minerals with relation to geology and to agricultural chemistry. In Nov. 1807, his second Bakerian Lecture was read, in which he announced the most important and unexpected discovery of the decomposition of the fixed alkalis by galvanism, and of the metallic nature of their bases, to which he gave the names of potassium and sodium. From the year 1808 to 1814, twelve papers by Davy were read before the Royal Society, and published in their 'Transactions,' relating to various chemical and electro-chemical subjects, and all containing details of original and important researches. He showed that the earths barytes, strontian, lime, and magnesia, are oxides of metals, and he laid the foundation which has enabled other chemists to prove the same thing in respect to other earths. He made important additions to the existing knowledge concerning sulphur, phosphorus, carbon, chlorine, alkalies, and indeed extended almost every department of chemical science. In 1810 he published the first volume of his 'Elements of Chemical Philosophy,' which, although it bears marks of haste, contains much interesting matter: no further portion of this work was printed. His 'Elements of Agricultural Chemistry,' which appeared soon after, is a work containing much useful matter, and replete with sound and practical views of the subject. One of his greatest inventions was that of the miner's safety-lamp, the first paper in relation to which appeared in the 'Philosophical Transactions' for 1815, and the last in 1817.

Davy became president of the Royal Society in 1820, and he continued to contribute papers on subjects of great interest for some years. He was knighted on the 8th of April, 1812, and on the 11th of the same month he married the daughter and heiress of Charles Kerr, of Kelso, Esq., with whom he had a very considerable fortune. He was afterwards created a baronet. He died on the 28th of May, 1829, at Geneva.

Dr. Henry thus characterises Davy:—'His imagination, in the highest degree fertile and inventive, took a rapid and extensive range in the pursuit of conjectural analogies, which he submitted to close and patient comparison with known facts, and tried by an appeal to ingenious and conclusive experiments. He was endued with the spirit and was a master of the practice of the inductive logic; and he has left us some of the noblest examples of the efficacy of that great instrument of human reason in the discovery of truth. He applied it not only to connect classes of facts of more limited extent and importance, but to develope great and comprehensive laws, which embrace phenomena that are almost universal to the natural world. In explaining these laws he cast upon them the illumination of his own clear and vivid conception; he felt an intense admiration of the beauty, order, and harmony which are conspicuous in the perfect chemistry of nature, and he expressed those feelings with a force of eloquence which could issue only from a mind of the highest powers and the finest sensibilities.'

(*Memoirs of Sir Humphry Davy*, by Dr. Davy; *Life of Sir Humphry Davy*, by Dr. Paris.)

DAVYNE occurs crystallised. Primary form a rhomboid. Colour white, sometimes yellowish brown. Hardness, 5.0 to 5.5. Transparent, translucent, opaque. Specific gravity, 2.4. Found in the more ancient rocks of Vesuvius. Silica, 42.97; alumina, 33.28; lime, 12.02; peroxide of iron, 1.25; water, 7.43; loss, 3.11.

DAWES, RICHARD, was born at Market-Bosworth in the year 1708. His first teacher was Anthony Blackwall, the author of the 'Sacred Classics,' after which he spent some time at the Charter House, and went to Emanuel College, Cambridge, in the year 1725: he was elected fellow in 1731. In 1736 he published a specimen of a translation of 'Paradise Lost' into Greek hexameters. He became master of the grammar-school at Newcastle-upon-Tyne in 1738; but his disagreeable manners diminished the number of his scholars, and he resigned the situation in 1749. He died at Haworth, 21st of March, 1766. The work on which his fame rests is his 'Miscellanea Critica,' published at Cambridge in 1745, which places him in the same class with Bentley and Porson as a verbal Greek critic. The leading characteristic of the scholarship of Dawes is a proneness to rash generalisation. Hardly one of the syntactical rules which Dawes has laid down has been admitted as unexceptionable; and some of them have been completely overthrown by the number of passages in which they are violated. The violent animosity which Dawes shows towards Bentley is only to be accounted for by the universal dislike which that great scholar had incurred during his quarrels with Trinity College, about the time when Dawes was a young member of the university. The best editions of the 'Miscellanea Critica' are those by Burgess, Oxon., 1781, and by Kidd, Cantabr. 1817, in which specimens of his other writings may be seen.

DAWLISH. [DEVONSHIRE.]

DAX. [LANDES.]

DAY, any astronomical period which depends directly upon the earth's rotation; or the interval between two transits over the meridian of any point in the heavens, real or imaginary. But the only *days* distinguished by that name in astronomy are the *sidereal day*, the *real solar day*, and the *mean solar day*.

The *sidereal day* is the interval between two transits of the same fixed star; that is, the absolute time of revolution of the earth. It is divided into 24 sidereal hours, &c. It begins when the equinox is on the meridian of the place.

The *real solar day* is the interval between two noons or transits of the sun over the meridian. Owing to the unequal motion of the sun, as well as the obliquity of the ecliptic, it is not of the same length at all periods of the year. The *mean solar day* is the average of all the real solar days; it is derived by supposing a fictitious sun to move round the equator, and uniformly in the same

time as the real sun moves from an equinox to the same again.

The civil day, in England at least, is the mean solar day, and begins at midnight; that is, when the fictitious sun is on the invisible part of the meridian. But the astronomical day always begins at the noon of the civil day, and the hours are reckoned forward up to 24. Thus eleven o'clock in the morning on the twelfth of January (civil reckoning) is 23 hours of the astronomical *eleventh* of January. Afternoon, and up to midnight, the astronomical and civil reckoning coincide.

DAY, THOMAS, was born in London in 1748. His father died when he was a year old, leaving him a fortune of 1200*l.* a year. He received his education at the Charter House, and at Corpus Christi College, Oxford, but took no degree. He had adopted certain peculiar opinions on the subject of education, and about 1769 he proceeded to put his theories to the test of experiment by selecting two girls from the foundling hospital at Shrewsbury, to educate according to his own notions, in order to marry one of them. He did not marry either; but the girls married well, and the propriety of their conduct through life did honour to his training. In 1779 Mr. Day was called to the bar; but he never practised. In 1773 he had made his first appearance as an author, in a poem entitled 'The Dying Negro,' directed against the atrocities of the slave-trade, and in 1776 he had published another, called 'The Devoted Legions,' which was an attack on the American War. He wrote on many other topics of the day. In 1783 appeared the first volume of the work by which he is now principally remembered, his 'History of Sandford and Merton;' the second volume was published in 1786, and the third in 1789. The object of this fiction is to illustrate and recommend the views of the author on education and on human nature generally; and its freshness and vigour, and the strain of disinterestedness and philanthropy that pervades it, render it attractive, especially for the young. Day is also the author of another shorter work of fiction, called 'The History of Little Jack.' He was killed September 28, 1789, by a kick from a young horse, which he was training upon some new principle; for his schemes for the improvement of education embraced the inferior animals as well as his own species.

DAYS OF GRACE. [Bill of Exchange.]

DEACON, an ecclesiastical term of Greek origin, from Διάκονος (Diáconus, literally, *a servant*), introduced into the Saxon vocabulary, and continued in use to the present time.

It designates one of the *orders* in the Christian priesthood, the lowest of the three—bishops, priests, and deacons.

The first institution of the order is particularly set forth in the sixth chapter of the 'Acts of the Apostles.' The peculiar office of both deacons and deaconesses was to attend to works of mercy, to be the administrators of the alms of the more opulent members of the church.

In the English Church the name continues, and the peculiar form of ordination, but the peculiar duties of the office seem to be lost sight of. In fact the Poor Laws, by creating certain civil officers whose duty it is to attend to the poor, have perhaps rendered the services of the deacon in this his characteristic capacity less necessary.

In some dissenting communities there are deacons who still discharge the duties for which the office was instituted; they collect the alms of the people at the sacrament, and distribute them among the poor; but they are always laymen, or persons who have not gone through the forms, generally few and slight, of ordination as practised among the dissenters.

There is a form for the ordination of deacons of the English Church. Some clergymen never take priest's orders. A deacon performs all the ordinary offices of the Christian priesthood, except consecrating the elements at the administration of the Lord's Supper and pronouncing the Absolution. A person may be ordained deacon at twenty-three. He may then become a chaplain in a private family; he may be a curate to a beneficed clergyman, or lecturer in a parish church, but he cannot hold any benefice, or take any ecclesiastical promotion. For this it is requisite that he take priest's orders.

DEAD SEA. [Palestine.]

DEAF AND DUMB. The subject of deafness and its consequences has not received that degree of attention which its importance deserves. Few persons have an idea of the extent to which it prevails, and fewer still form correct notions of the amount of deprivation under which a totally deaf person labours. Till institutions for the instruction of the deaf and dumb began to multiply, and thus to attract public notice and sympathy towards this unfortunate class of persons, it was believed that the deaf and dumb formed a very minute fraction of the population. Perhaps one cause of the general want of knowledge on this subject is the incapability of the deaf and dumb to give utterance to their own deficiencies. The very nature of their deprivation prevents their making it known and obtaining relief. Thus generations have lived and died in wretchedness and obscurity.

The proportion of deaf persons to the population of Europe is 1 to 1537. The United Kingdom contains 1 to 1622 of the population.

Deafness occurs in every degree, in some cases only amounting to an insensibility to very sharp notes. Many people cannot hear the squeaking of the bat and the mouse. By holding the nose, inflating the ears, and ceasing to breathe, the ear is rendered more open to base notes, and more deaf than it naturally is to sharp notes. Dr. Wollaston constructed a small organ, whose notes began where the sharp notes of ordinary instruments end; the notes of his organ increased in sharpness till they became inaudible, though he was certain that it continued to give sound, from feeling the vibrations equally with the lower notes. He thus found that some people could hear seven or eight notes higher than others, and that children could generally hear two or three notes higher than grown up people. In some persons the accuracy of the ear is merely impaired in distinguishing faint sounds, and sounds some-

what similar. Instances of this kind are particularly evident in infants, whose first attempts at speech are a very remote similarity to the sounds they hear, which become more perfect as their ear is educated, and in some cases remain imperfect through life, in consequence of defect in the organs of hearing. All imperfections of speech do not arise from imperfect hearing. An indistinct articulation may result from various other causes, from carelessness, from defective organs of speech, or an imperfect formation of those organs, from irregular respiration producing hesitation, and in some instances proceeding from nervousness.

Before the practicability of instructing the deaf was known, it was generally supposed that instruction by means of language was limited to those who could hear. The idea never occurred, or, if it did, was as instantly rejected, that the deaf man was not, by reason of his deafness, excluded from the means of acquiring knowledge. It was not till the 16th century that the possibility of carrying forward the process of education, in the absence of all hearing, received any serious consideration. Even at the present day there are many persons who are at a loss to conceive not only how abstract notions, but even how the names of palpable objects are made known to the deaf, and at a still greater loss to imagine how they can be brought to use language to express their ideas. Having themselves obtained knowledge through the ear, having been accustomed to impart their thoughts by oral communications, they seem to forget that the mind has intelligence in all the senses, connecting it with the external world, and conveying knowledge to those higher faculties which compare, discriminate, and judge. In an intelligent though uneducated deaf person an observer would find these processes going forward, though confined indeed to a very limited sphere, owing to the poverty of his knowledge, but still knowledge, and deduced from observation. The existence of the reasoning power being thus evident, the means to cultivate it would be the next object for philosophic investigation.

From the advantages which instruction has afforded to a certain proportion of the deaf and dumb for the last half century, a tolerably correct estimate may be formed of their capabilities for improvement. The deaf-mute living in society, but without instruction, must be regarded as one of the most solitary and melancholy of beings. He is shut out from all but the most imperfect intercourse with his species; and the very intellect by the possession of which he is raised above the lower creation serves only to heighten his calamity, and to render the sense of his deprivation more acute. His perceptions of external objects are indeed accurate but superficial, and confined to a very small sphere. Of the various arts by which the necessaries and conveniences of civilised life are produced, he can have no knowledge beyond that which is included in the range of his own vision. Animal desires he feels, and he is led by the conventional usages of society to the performance of moral duties and the avoidance of open and flagrant crime. Thus he becomes experienced as other human beings are in what is right or wrong. He sees that virtuous actions have a certain amount of reward, in the opinions of good men; for he learns to discriminate between those whose actions are proper and those who do wrong; and, again, he sees that in many cases vice meets with disapprobation and punishment among mankind. How this kind of experience shall affect his own conduct must depend not only on the circumstances in which he is placed, as to example and the moral influence of those with whom he has to associate, but also on his own natural tendencies.

The performance of moral duties implies the exercise of intellectual faculties; and from his birth the deaf-mute makes use of his reasoning powers. He is subject to changes of purpose, to changes of feeling, to the passions, the pleasures, and the infirmities common to his species. He is sensible of kindness; he gives proofs of affection. That such is the uneducated state of the deaf and dumb might be proved by the observations of their parents, friends, and instructors in hundreds of instances. That such must necessarily be the case, supposing them not to be idiots, it would be easy to show. We affirm, in contradiction to those who contend that deaf-mutes are naturally more debased than other men in intellect and in morals, that there is not an individual deaf-mute now under instruction—improving, and thereby evincing rational faculties—who, previous to instruction, however disadvantageous the circumstances which attended his earlier years, did not evince moral sentiments and intellectual operations. We have traced the history of many of this class in different ranks of society down to the period when the deprivation under which they have laboured was first ascertained; and we have found invariably that mixture of good and evil in their actions and tendencies which is seen amongst other children. We have also had sufficient proofs of the exercise of intellect even while they were in a state of childhood. The parents of deaf and dumb children can sufficiently attest the truth of these observations.

At the same time, it must be acknowledged that the deaf and dumb are generally inferior in their moral and intellectual powers to those who do not labour under the same defect. But this inferiority is only one of degree, and may be satisfactorily accounted for, in accordance with the opinions above expressed. Dr. Whateley is quite wrong in his statement that a deaf-mute, before he has been taught a language, cannot carry on a train of reasoning any more than a brute ('Elements of Logic'). Andral has described the state of an uneducated deaf and dumb person; and to a certain extent we can adopt his sentiments. Experience and observation among this class of persons would have induced this accomplished pathologist to have bestowed on them even a more liberal endowment. 'The deaf-mute exhibits in his intellect, in his character, and in the development of his passions, certain modifications which depend on his state of isolation in the midst of society. We find him remain habitually in a sort of half-childishness,

and he has great credulity: to balance this, he is, like the savage, exempt from many of the prejudices which we owe to our social education. In him the tender sentiments are not very deep; he appears not to be susceptible either of lasting attachments or of lively gratitude; pity touches him but feebly; he is an entire stranger to emulation; he has few enjoyments and few desires; and the impressions of sadness but slightly affect him. This is what is most commonly observed in deaf-mutes; but this picture is not universally applicable. Some, more happily endowed, are remarkable for the great development of their intellectual and moral nature; there are others, on the contrary, who continue in a state of complete idiotcy.' ('Dictionnaire de Médecine,' article Surdi-Mutité.) This last remark of Andral's requires some qualification. Deaf and dumb persons who possess intellectual faculties are no more liable to become idiots than others whose organs perform their appointed functions. Their powers may remain undeveloped; they may be ignorant of every thing which depends on intercourse with mankind; their reasonings may be inconclusive, and their inferences erroneous, from their confined observations; but still their mental powers will be called into action, and they will be, to a great extent, under the control of their reasoning faculties. This is not the case with idiots, in them there is a total want of self-government, a total absence of intellectual control. There are, at the same time, numerous cases of idiots who are *dumb;* not however in consequence of deafness, but from their incapacity to understand the meaning of language, to imitate it, and to apply it. These persons cannot be classed with *the deaf and dumb.* It may be this class to which Andral particularly alludes in the latter part of our quotation; for he qualifies his remark in some measure by adding, 'The difference in the intellectual and moral nature of man is often primitive, and independent of all external influences.'

Many first discoveries were probably made of the art of instructing the deaf and dumb; several of them originated with or were carried forwards by philologists, and particularly among the schemers for a universal language. In England, John Bulwer's name must stand prior to that of any other individual as an author on the subject, and his views, as given in 'Philocophus,' are sound and practical. It has often been attempted to place Dr. Wallis at the head of this list of discoverers in England; but Bulwer's 'Philocophus, or the Deafe and Dumbe Man's Friend,' was published several years before Wallis attempted even his treatise on speech, and he did not publish his claims as an instructor of the deaf till 1670. We find, on consulting the abovenamed work of Bulwer's, that chap. xv. contains the relation of Sir Kenelm Digby as to what Bonet had accomplished in Spain; and there is no doubt but Wallis obtained information from the same source, as he was in constant correspondence with Sir K. Digby. [BULWER.]

A degree of credit is certainly due to Dr. Wallis for the pains he took to systematise what had been done up to this period, and to bring the philosophy of language to bear upon the art. His two great objects, as stated in a letter to Mr. Boyle, were 'to teach a person who cannot hear to *pronounce the sound of words,*' and to teach him 'to *understand a language* and know the signification of those words whether spoken or written, whereby he may both express his own sense and understand the thoughts of others.' Writing, reading on the lips, and speech, the manual alphabet, logical induction, the natural signs—acquired from the deaf—were the means he made use of. From the accounts which have come to us, he succeeded in his purpose. His pupil, Daniel Whalley, was exhibited before the Royal Society in the year 1662. The priority of his invention was disputed by Dr. William Holder, rector of Bletchington, who asserted that he had, in the first instance, taught Popham, one of Dr. Wallis's pupils, to speak. Holder published his 'Elements of Speech, with an Appendix, concerning persons Deaf and Dumb,' in 1669, which was some years after Wallis's first writings and practice had been made known.

In the same year (1670) in which Wallis made known the results of his researches, George Sibscota published a little work on the subject, entitled the 'Deaf and Dumb Man's Discourse.' He had learned from the writings of Franciscus Vallesius to what extent Ponce had succeeded. Very little can be gleaned from this work, which consists chiefly of reasoning and theory.

The next author on the subject whose work we shall notice is George Dalgarno. His treatise, though full of the conceits of learning, is essentially practical, and even at the present day it might serve as a guide to an intelligent person who desired to become an instructor of the deaf. The date of this little work is 1680. [DALGARNO.]

Dalgarno announces on the title-page of 'Didascalocophus,' that his treatise is the first (for aught he knows) that has been written on the subject. He commences by showing that a deaf man is as capable of understanding and expressing a language as a blind man, inasmuch as all information is conveyed to the mind through the bodily organs. He goes too far however in attempting to show that the deaf man has even superior advantages in acquiring languages to those of the blind. Dalgarno's alphabet is exhibited in the article DACTYLOLOGY.

About the middle of the 17th century the art received much attention in Holland. Peter Montans, Van Helmont, and Amman were successively occupied with it, and they all made known their views. In Germany, Kerger, Arnoldi, and Heinicke devoted much attention to the subject. France was later; but the labours of Pereire, Deschamps, De l'Epée, and Sicard were more successful than those of any previous instructors.

In the early part of De l'Epée's career he met with the work of Bonet before mentioned, and the enlarged treatise by Amman, 'Dissertatio de Loquela.' With these guides, aided by the enthusiasm which formed a part of his character, he pursued his task vigorously and with a certain amount of success; but not with the success of some of his forerunners in the art, who had devoted

themselves entirely and for years to individual pupils. The Abbé had a large number of pupils to whom he devoted his life and patrimony. Every one who has been a teacher knows well the degree of success which he may expect if his whole mind is concentrated upon the improvement of a few individuals, and the difficulties he may anticipate if his attention is divided among a greater number of pupils. The Abbé appears to have made use of articulation in one part of his career, for he wrote a treatise on the mode of teaching by this auxiliary; this treatise was chiefly derived from the writings of Bonet and Amman. He employed dactylology, as it ever must be employed, so long as it is confined to the alphabet only, in a subordinate degree. Pictures he found an uncertain resource, and only useful in the earlier stages of instruction. Methodical signs and writing were the means on which he chiefly depended for the conveyance of intellectual knowledge. The employment of methodical signs for words is only the substitution of one artificial language for another. He established a connection in the mind of the pupil between these signs and the language of their country; but it is by no means satisfactory that he established a connection between these signs and the ideas which they were intended to represent.

The Abbé De l'Epée commenced his work by endeavouring to perfect a language of methodised signs as copious and accurate as the spoken language of a highly civilised country. He seems to have believed that he had only to do this to reduce the process of teaching the deaf to a mere translation. He appears to have lost sight of the fact that he had minds to cultivate and to fill with knowledge, and that without this cultivation the mere knowledge of words, the translation of words into gestures, and of gestures again into writing, would be but labour lost. When he gave his pupils signs for words, he imagined that with the signs he gave them ideas, but he only gave them words. In acquiring a second language, those who already possess one have at command a comparative grammar which informs them to a certain extent of the value of certain words in certain connections with others: but the deaf have no such advantage; their natural and uncultivated language—gesture—is powerless for everything but the expression of their most ordinary wants; they have no separation of their ideas into classes, such as produce the parts of speech in more perfectly formed languages. Adelung mentions the inhabitants of the countries on the Asiatic continent as having 'but one sound to signify *joyful, joy, to rejoice;* and that through all persons, moods, and tenses. The mere radical ideas are set down together, the connecting links must be guessed at. They form plurals as children do, either by repetition, as *tree, tree,* or by adding the words *much* or *other,* as *tree much, tree other.*' ('Mithridates,' i. p. 18.) Thus it is with the naturally deaf, the radical idea is all that their gestural language is capable of expressing until modified by those arbitrary forms of speech which are the accessories of every polished language.

We do not regard the success of the Abbé De l'Epée as complete, but we are satisfied that he pursued his methods with openness and candour, and with the single desire of promoting the moral and intellectual advancement of the deaf and dumb. His successor, the Abbé Sicard, carried forward the principles of De l'Epée: he instructed his pupils in the elements of composition, a branch of their education comparatively new, and in which Sicard most completely evinced his superiority over his master. Sicard at first conducted a school at Bordeaux; on the death of the Abbé De l'Epée, Sicard was called to fill his place at Paris. The philosophical opinions and penetrating views which Sicard maintained and practised are well developed in his 'Cours d'Instruction d'un Sourd-Muet,' in which is developed the plan on which he conducted the education of his celebrated pupil Massieu.

We have sometimes been surprised that the 'Cours d'Instruction d'un Sourd-Muet' has not been translated into our language. Independent of its novelty and interest as connected with its more immediate design, its gradually unfolding of a great mind involved in moral and intellectual darkness, by a metaphysician of high endowments, presents some interesting psychological facts which would make it serviceable in general education; the illustrations of language and the development of ideas are just such as an accomplished and lively teacher would desire to place before his pupils to assist in conveying to their minds a just estimation of the value of words and the knowledge which they serve to impart.

In England, after the time of Bulwer, Wallis, Sibscota, and Dalgarno, the art slumbered for many years. It was revived by Henry Baker, the naturalist and microscopical observer, who taught dumb persons to speak, and of whom it is recorded by Dr. Samuel Johnson, that he once 'gave him hopes of seeing his method published;' he however kept the plan he followed secret. Of the extent of his success we know nothing, but it is said that the names of some of the first families in the land are among those of his scholars. [BAKER, HENRY.] About the year 1760, Thomas Braidwood had an academy at Edinburgh, where he taught the dumb to speak, and cured impediments in the speech. He professedly pursued the plan of Dr. Wallis, as developed in the 'Philosophical Transactions.' Articulation was therefore the chief instrument of instruction, and the principal medium of communication between the pupil and teacher. In 1783 Braidwood removed his school to Hackney, where he enjoyed for many years a deserved reputation for his successful application of the discoveries of his predecessors. [BRAIDWOOD.] Under him the late Dr. Watson became acquainted with those principles which he brought to much greater perfection than his predecessor, and developed in his work on the 'Instruction of the Deaf and Dumb,' and which he practised during his long superintendence of the Asylum in Kent Road, London. Indeed Dr. Watson was to Mr. Braidwood what Sicard was to De l'Epée; the disciples in each instance gave solidity and permanence to the systems of their respective masters.

We must refer to the article 'Deaf and Dumb' in the 'Penny Cyclopædia' for numerous statistical details on the subject of deafness; for particulars as to the rise and progress of the art of instruction; the methods pursued by teachers having dissimilar views; and for historical details connected with the progress of the Art in the United Kingdom, and the formation of the several institutions whose present position we are about to notice. Since the publication of that article (1837) many changes have taken place in existing institutions, and several new establishments for the deaf and dumb have been formed. We believe the least change has taken place in the London Asylum, Kent Road; it is still under the management of Mr. T. J. Watson, and contains about 300 pupils. The institution at Edinburgh is now under the care of Mr. Cook, a teacher who was trained by Mr. Baker, at the Yorkshire Institution, and who is very successfully carrying out the principles of the establishment in which he was brought up. This Institution will probably, at no distant day, be converted into a large industrial establishment for the Deaf and Dumb of Scotland, under the following interesting circumstances:—A magnificent building has recently been erected at Edinburgh, which is called 'Donaldson's Hospital,' and which is designed for the education of the poor. It is not at present ready for occupation, but its trustees have taken the commendable preliminary measure of resolving that poor children who are deaf and dumb shall not be excluded from its operations. The pupils will be fed, clothed, and educated gratuitously; and the funds are ample. The consequence may therefore be that 'Donaldson's Hospital' will become a large national establishment for the education of all the deaf and dumb poor of Scotland. The existing institution may therefore be converted into an industrial Asylum for the Deaf and Dumb, where their peculiar talents may be usefully occupied for their support after quitting school; and to provide them with a permanent means of subsistence in after-life. The toils of the day may there be followed by evening classes for instruction, lectures, and amusements; while on the Sabbath it may be the church of a mute congregation. Such a design is highly interesting, and can hardly fail, under proper restrictions, of being successful. The Institution at Birmingham, under the care of Mr. Hopper, formerly an assistant at the Dublin Institution, has not only increased in prosperity, but in usefulness and extent during recent years. According to the last Report upwards of sixty pupils partake of its benefits. The Dublin Institution has been recently placed under the charge of Mr. Foulston, who succeeded Mr. Cook, when that gentleman was placed at the head of the Edinburgh Institution. Mr. Foulston obtained his experience as an assistant for five years at the Yorkshire Institution. The Glasgow Institution, under Mr. Anderson, still retains its condition of excellence and prosperity, and provides for the education of about seventy pupils. The institution at Manchester has been under the charge of Mr. Patterson for several years; it is located in a spacious building at a short distance from that city, and contains about 80 pupils. The school at Liverpool continues prosperous under its mixed character of boarders, day boarders, and day pupils, 63 in number, under the care of Mr. Rhind. The establishment at Exeter was, in 1841, confided to the superintendence of Mr. Scott, who had previously qualified himself for the work as an assistant in the Yorkshire Institution. The latter institution is situated at Doncaster; it has increased greatly in extent and in its means of usefulness during the last ten years. The number of pupils is at present 95, and it is still under the charge of Mr. Baker. Perhaps the most important proceeding connected with this Institution, and indeed with the Deaf and Dumb as a body, is an inquiry that has been made into the present condition of the former pupils of this establishment. This inquiry embraced their conduct and character after leaving school; their occupations, and the degree of facility, compared with others, with which they acquired their respective trades. Tolerably full returns were obtained of 122 pupils, occupied in 35 distinct occupations. Of these 122, it was found that 74 acquired their business as well as ordinary persons, 18 nearly as well, 16 more readily than in usual cases, 8 not so well, and in six cases the returns were ambiguous. On the subject of conduct and character, 64 are highly commended; 43 are reported well of; 7 have given some cause for complaint; 6 have misconducted themselves, and in 2 cases the returns were ambiguous. It is only by inquiries of this character, which ought to be pursued not only among the deaf and dumb, but among all pupils, not only among the poor, but among the middle classes and the rich, and which ought also to be recorded, that the actual results of education can be ascertained.

During the last eleven years several new institutions have been established, and others then struggling into existence have become permanent. Among these is one at Belfast for the Deaf and Dumb, and the Blind [BLIND]; another was established for the Deaf and Dumb and the Blind at Newcastle, but its operations are now confined to the Deaf and Dumb; it is under the control of Mr. Neill, a very promising teacher, who was trained to his present employment under the supervision of Mr. Anderson, at the Glasgow Institution. There is at Newcastle a distinct asylum for the Blind. A very thriving institution for the deaf and dumb has also been established at Brighton, which is under the management of Mr. Sleight, one of the former assistants at the Yorkshire Institution; another at Aberdeen is under the charge of Mr. Weir; another at Bristol is conducted by Mr. Webster; and one has been recently established for the principality of Wales, at Aberystwyth, which is conducted by Mr. Charles Rhind.

We have not space to enter into any particulars respecting the institutions on the continent of Europe, or those of the United States. We are however bound to mention a very useful quarterly publication which is conducted by Mr. Ed. Morel, the principal teacher at the Royal Institution at Paris, 'Annales de l'Education des Sourds-Muets

et des Aveugles,' which is devoted to recording facts connected with the deaf and dumb, and the blind, and the institutions in which they are educated. This small publication has just commenced the fifth year of its existence; and thus far it has well fulfilled its early promise of usefulness. A few years ago the directors of the two principal American institutions deputed parties to visit the institutions of Europe to ascertain the extent to which articulation was taught to the deaf and dumb in the different European institutions, as well as to make various other inquiries of interest connected with modes of instruction, management, domestic economy, &c. These gentlemen visited most of the institutions of Europe, England included, and published very lengthy reports on the various subjects to which their attention was directed. Their reports seem to have been highly satisfactory to the parties from whom they received their credentials, and to the American public, if we may judge from the notice taken of them in the American Review for May 1846. These reports, one drawn up by Mr. Weld of the Hartford Institution, and the other by the Rev. Mr. Day, formerly connected with the institution at New York, are quite conclusive on the main point, namely, that *there are no institutions for the deaf and dumb in existence that are superior to those of America;* while parties disposed to draw extreme inferences might, with little difficulty beyond a careful perusal of the reports, arrive at less flattering conclusions respecting the institutions for the deaf and dumb of Europe.

DEAFNESS, the sense of hearing diminished or abolished. Deafness is either congenital or acquired. When congenital, it arises from an original malformation of the ear, and is then always accompanied with dumbness. When acquired, it arises from a variety of diseases affecting different parts of the complex apparatus connected with the sense of hearing. Deafness may arise from disease of the organ of hearing, or from disease of the brain. The organ of hearing is described under EAR.

Any considerable malformation of the auricle, or external ear, whose office it is to collect the vibrations of the air that produce sound, is found to occasion a greater or less degree of deafness. But the external auditory passage is lined by a vascular and highly sentient membrane, studded with organs of secretion, by which are elaborated the cerumen, or wax, with which the passage is kept in a state of moisture. A vitiated state of the secretion of the wax, which may be accumulated in such a degree as completely to block up the passage, and so to prevent the transmission of sound to the internal ear, is among one of the most common causes of deafness. But inflammation may pass into ulceration; purulent matter may form, collect, and completely obstruct the transmission of sound. Moreover, morbid growths, as polypi, may spring from the lining membrane of the meatus, and plug up the passage. In these different modes there may be either a partial or a complete obliteration of the auditory passage, of which the necessary result is a partial or complete deafness.

The diseases of the auditory passage may be communicated to the membrana tympani, which may be inflamed, thickened, ulcerated, and rendered wholly incapable of performing the office of transmitting sound. Deafness often coincides with this altered condition of the membrana tympani. The membrane which lines the chamber of the tympanum may partake of the diseases of the parts of the auditory apparatus which are external to it, or it may itself be the primary seat of disease. It may become inflamed and thickened, in consequence of which the capacity of the chamber for containing air must be proportionally diminished. The fluid commonly secreted by its membrane may be increased in quantity and vitiated in quality, and this increased and vitiated liquid may occasion deafness by the exclusion of air from the chamber.

One of the conditions essential to the sense of hearing is a free passage of air to the chamber of the tympanum through the Eustachian tube. But the diameter of this tube may be diminished or wholly obliterated by an accumulation of the mucus which moistens its internal surface, by the thickening of its lining membrane, and by the adhesion of its membrane at different points.

The internal ear, or that part of the auditory apparatus in which the impression of sound is received, the true and proper ear, is, without doubt, subject to its own diseases; but this organ is placed so far beyond the reach of examination, and the functions of its different parts are so little understood, that its morbid changes, as the causes of deafness, are alike obscure during life, and difficult to be appreciated by inspection after death.

When deafness arises from inflammation of the auditory passage, the deafness can be cured only by the removal of the inflammation, which must be treated according to the principles proper for the treatment of inflammation in any other part of the body. When deafness results from a disordered action of the follicles which secrete the wax, it is often removed by introducing into the auditory passage, night and morning, a dossil of cotton, containing some stimulating substance, as camphor, ammonia, or alcohol, suspended in almond-oil. When the auditory passage is loaded with hardened wax, the ear should be syringed night and morning with warm milk and water, or soap and water. When polypi grow from the lining membrane of the passage, they must be removed by a surgical operation, and the proper precautions taken to prevent, or the proper remedies employed to remove, inflammation. When there flows from the passage an acrid or fetid discharge, the ear should be cautiously syringed night and morning, and counter-irritation kept up by repeated blisters behind the ear, or by a perpetual blister, caused by daily dressing the vesicated surface with unguentum lyttæ. When the deafness arises from a diminished secretion of wax, good effects have often been experienced by the employment of galvanism, which is found not only to occasion a grateful warmth in the meatus, but also considerably to augment the secretion of wax. When deafness arises from inflammation of the membrane which lines the chamber of the tympa-

num, and from the consequent thickening of the membrane, or the effusion of fluid into the cavity, the most effectual remedies are blisters behind the ears and active purgative medicines. When closure of the Eustachian tube is the cause of deafness, the imperfection of hearing is often immediately removed by perforating the membrana tympani, this operation immediately establishing a free communication of air to and from the tympanum. When deafness is the consequence of disease of the auditory nerve, or of the brain, the nature of the nervous or cerebral affection must be discriminated and ascertained before any remedy can be applied with the slightest chance of success; and, even when this is accomplished, it is too often only to satisfy us that the disease is beyond the reach of art.

DEAL. [KENT.]

DEALS are boards of fir above 7 inches in width, and of various lengths exceeding 6 feet. If less than 7 inches wide, they are called battens. The duty on deals or boards since April 5, 1848, is 1*l.* the load, if imported from a foreign country; but if from a British possession it is 2*s.* the load.

DEAN (French *Doyen*, and in Latin *Decanus*). The word *Dean* is generally used as an ecclesiastical term: but in Scotland it is also applied to a civil officer, as the dean of guild; and the French word Doyen is applied both to ecclesiastical and lay personages. Richelet (*Dict.*, art. *Doien*) says that, when applied to other than ecclesiastical bodies, it signifies the oldest of the body; thus the French used to speak of the 'Doien des Conseillers du Parlement.' The Italian word *Decano* also signifies the head of a lay corporation, as well as an ecclesiastical dignitary. In University College, London, the dean is the chief or head of a faculty chosen for a limited period. Deans in the colleges of Oxford and Cambridge are persons appointed to superintend the religious service in the college chapels, to enforce the attendance of the students there, and to exercise some control over them in other respects.

In England there are three classes of ecclesiastical presidencies to which the title dean belongs.

1. *Deans, Rural.* The dioceses are divided into archdeaconries, and the archdeaconries into deaneries, below which there is no other subdivision till we come to parishes, the minutest of the proper ecclesiastical divisions of the country. The whole country is thus divided, with the exception of certain districts of no great extent, which claim to be exempt jurisdictions.

In each of these deaneries there was a clergyman who was dean; he was usually a beneficed clergyman within the deanery. His duties were to exercise a superintendency over the clergy, to preside at their assemblies, and to be the medium of their communication with their spiritual superiors. He had his public seal: he appears also to have discharged those duties which are now performed by clergymen called surrogates. By degrees, this office in the English Church fell into disuse.

2. *Dean in a Cathedral Church.* The canons who formed the bishop's council were presided over by a dean; this has been the case from the remotest times. *Decanus et capitulum*, or dean and chapter, is the form in which all the acts of such communities run.

Anciently the deans were elected by the chapters: now the form is for the crown to issue a *congé d'élire*, naming the person whom the chapter is to choose, in the bishoprics of ancient foundation; but in the bishoprics founded by Henry VIII. the king names the dean by his letters patent merely. In the former case the bishop is called in to confirm the election, and he issues his mandate for the installation of the person elected. In some instances the office of bishop and dean have been united in the same person.

3. *Deans in Peculiars.* There are in England certain ecclesiastical promotions, in which the person holding them is called by the name of dean, and they seem to have all had anciently, as some of them have now, capitular bodies connected with them and in all there is something peculiar in reference to their spiritual superiors, and in the jurisdiction exercised by them. The principal of them are—the dean of Westminster; the dean of the chapel of St. George, of Windsor; the dean of Christ Church, Oxford; the dean of the Arches; the dean of the King's Chapel; the dean of Battel; the dean of Bocking; and others. There are also *Honorary Deans*, as the dean of the Chapel Royal of St. James's Palace.

DEATH-WATCH. Every one has heard of the death-watch, and knows of the superstitious notion of the vulgar, that in whatever house its drum is heard, one of the family will die before the end of the year. These terrors, in particular instances, when they lay hold of weak minds, especially of sick or hypochondriac persons, may cause the event that is supposed to be prognosticated. A small degree of entomological knowledge, however, would relieve them from their fears, and teach them that this heart-sickening tick is caused by a small beetle giving a call to its companion.

Authors were formerly not agreed concerning the insect from which this sound of terror proceeded, some attributing it to a kind of wood-louse, and others to a spider. The earliest scientific account of it is probably that by Mr. Benjamin Allen, written in 1695, and published in the 'Philosophical Transactions,' vol. xx. p. 376, where the writer calls it *Scarabæus galeatus pulsator:* followed, vol. xxii. p. 832, by another account from Dr. William Derham, dated Upminster, July 21, 1701. Swammerdam ('Bibl. Nat.,' edit. Hill, i. 125) and Shaw ('Nat. Misc.,' iii. 104) have also written upon this insect. It is a received opinion now, adopted upon satisfactory evidence, that the sound called the death-watch is produced by certain beetles belonging to the timber-boring genus *Anobium*. Latreille observed *Anobium striatum* to produce the sound in question; but the species whose proceedings have been most noticed by British observers is *Anobium tessellatum*. When spring is far advanced, these insects commence their ticking, which, as already mentioned, is only a call to each other, and if no answer be returned to it the animal repeats it in another place. It is thus produced:—Raising

itself upon its hind legs, with the body somewhat inclined, it beats its head with great force and agility upon the plane of position; and its strokes are so powerful as to make a considerable impression if they fall upon any substance softer than wood. The general number of distinct strokes in succession is from seven to nine or eleven. They follow each other quickly, and are repeated at uncertain intervals. In old houses, where these insects abound, they may be heard in warm weather during the whole day. The noise exactly resembles that produced by tapping moderately with the nail upon the table; and, when familiarised, the insect will answer very readily the tap of the nail.

(Brand's *Popular Antiq.*; Kirby and Spence's *Introd. to Entomology*, edit. 1828, i. 36; ii. 382.

DEBENTURE (Latin, *debentur*, from *debeo*, to owe), formerly written Debentur, was a kind of certificate used at the Custom House, which entitled a merchant who exported goods upon which a drawback or bounty was allowed to receive payment. Bounties are now abolished on all articles of export from England.

The word has been used in some acts of parliament to denote a bond or bill, by which the government is charged to pay a creditor or his assigns the money due on auditing his account. Debentures were used to secure the arrears of pay to the soldiery during the Commonwealth, and are mentioned in the Act of Oblivion, 12 Car. II. c. 8. They are in use now in the receipt of Exchequer and Board of Ordnance, and, it is believed, in the king's household. (Cowel's 'Interpreter.')

Debentures are often issued by various associated bodies.

DEBRECZIN, the capital of the county of Bihar, in Upper Hungary, stands in 47° 32′ N. lat., 21° 36′ E. long., in the centre of an extensive plain, and has 45,000 inhabitants. The town is open, and has more the appearance of a collection of villages than of a town; for the houses seldom exceed one story in height, and are as humble in their exterior as common cottages. The streets are unpaved and filthy. The best buildings are the town-hall, the Protestant and Roman Catholic churches. The town possesses a Calvinistic college and gymnasium, a Roman Catholic gymnasium, a school of design, an orphan asylum, 3 dispensaries, 3 hospitals, and a house of correction. The inhabitants derive their subsistence from agriculture and manufactures of coarse woollens, sheep-skins, pottery, leather, saltpetre, tobacco-pipes, and soap. Debreczin manufactures also knives and other cutlery, combs, buttons, pearl necklaces, &c. Its central position, and its great fairs, of which four are held in the year, afford it a ready vent for its products. The town is the seat of the court of appeal for the circle beyond the Theiss. It suffers greatly from want of water in summer. A railroad is in course of construction from Vienna, through Presburg and Pesth, to Debreczin.

DEBT, ACTION OF, lies for the recovery of a sum certain, or capable of being ascertained, due upon bond, specialty, or simple contract, or upon the judgment of a foreign or colonial court. It may also be maintained against a gaoler for the escape of a prisoner in execution, or upon a statute by the party grieved, or by a common informer.

DEBT, NATIONAL. [NATIONAL DEBT.]

DECAGON, a figure of ten sides; but the term is most commonly applied to an equilateral and decagon, or a *regular* decagon.

DE CANDOLLE, AUGUSTIN PY'RAMUS, was born in 1788 at Geneva, where his father was premier syndic. His family originally came from Marseille, but had for more than two centuries been settled at Geneva. His earliest tastes were altogether of a literary kind, and from infancy he was distinguished for the ardour with which he pursued his studies. He was remarkable for the facility with which he wrote verses, a taste in which he indulged throughout life. In the year 1792, with his mother and brother, he sought refuge, whilst the French were besieging Geneva, in a village situated at the foot of Jura. Here he amused himself in collecting wild plants, and acquired a taste for botany, which, after subsequently attending the lectures of Professor Vaucher in his native city, became the occupation of his life. In 1796 he went to Paris, and attended the lectures of Vauquelin, Cuvier, and Fourcroy. He also became intimately acquainted with Desfontaines and Lamarck.

The first efforts of De Candolle in botanical science were rather directed to the observation of facts, and the accurate distinction of species, than to the theories connected with the physiology or development of plants. His first publication was a description of succulent plants, delineations of which were supplied by Redouté. He also drew up the descriptions for the magnificent work of the same artist on the Liliaceæ, which was published in 1802. After a short withdrawal from Paris on account of the political state of France, he returned again to Paris in 1804, and took his degree of Doctor of Medicine. His thesis on this occasion was on the medical properties of plants. He therein demonstrated the close connection between the sciences of botany and medicine, and he subsequently delivered a course of lectures on a system of botanical arrangement and classification, which formed the basis of his future great reputation.

In the collection of plants De Candolle spared no personal pains, and, from the time of his being associated with Lamarck to 1812, travelled over every district of the then extensive possessions of France, for the purpose of examining its native plants. In these excursions also he was frequently employed by the government to report upon the state of agriculture.

In 1807 he was made Professor of Botany in the Faculty of Medicine at the University of Montpelier. In 1810 a chair of Botany being constituted in the Faculty of Sciences of the same place, he was appointed to it. During his residence at Montpelier he devoted much time to the botanic garden, and published a catalogue of the plants contained in it, with descriptions of many new species. Circumstances however occurred

which led him to quit Montpelier, and in 1816 he returned to his native city, which was restored to its independence on the re-establishment of the Bourbons on the throne of France. A chair of natural history was established especially for him at Geneva. In the same year he visited England to examine the collections of plants in the British Museum, the Linnæan and other societies, for the purpose of aiding him in the publication of his great work on the vegetable kingdom.

In 1818 appeared the first volume of this work, intended to comprehend a description of all known plants. He had fully prepared himself for carrying out the principles on which this work was based by the publication of his 'Théorie Eléméntaire,' in 1813. In this work he not only carried out the principles of a natural arrangement of plants, which had been previously developed by Jussieu and Adanson, but by a more extended study of the principles of morphology he was enabled to clear up many of the difficulties which existed in the grouping of plants in previous classifications. Whatever may be the claims of previous writers in this department of botanical inquiry, to De Candolle must be conceded the merit of giving definite expressions for the various causes which act upon the structure of plants, and pointing out the relation between abnormal forms in individual plants and normal forms in particular groups.

The natural system of the vegetable kingdom however was only commenced; a second volume appeared in 1821, but the author was obliged to abandon the design as a work of too great magnitude. He therefore in 1824 commenced the publication of a Prodromus of the larger work. But even this proved a work too extensive for completion during his lifetime. This work embraced descriptions of all the known species of plants. In it De Candolle gave a complete description of the polypetalous and part of the monopetalous exogens. This he accomplished with much labour and probably considerable injury to his health. In 1827 he published his 'Organography of Plants,' a work in which he traced each organ through all its modifications of structure in different plants. This work is in fact a development of the great doctrine of metamorphosis. It was followed, in 1832, by one on the 'Physiology of Plants.'

For several years previous to his death, De Candolle suffered from ill health. In 1841 he was induced to visit the meeting of naturalists held at Turin, in the hope that change of climate would restore his failing powers, but he derived no benefit from his journey, and died Sept. 9, 1841.

As a botanist De Candolle must be placed in the first rank in the century in which he lived. He possessed a quick apprehension, which enabled him to make use of the labours of others, added to a habit of methodical arrangement, by which he could at once refer the various facts that came to his knowledge to their proper position in the departments of the science which he pursued. It was this which, combined with a clear and pleasing delivery, made him a successful lecturer, and which enabled him to produce with rapidity so many works on botany. But he was not only a botanist; he was earnest in his sympathies with mankind, and was an active philanthropist and energetic citizen. In Paris, in the early part of his life, under the auspices of Benjamin Delessert, he took an active part in the formation of the Société Philanthropique of Paris, and the Society for the Encouragement of National Industry was formed under his direction and management. He was for many years a member of the legislative body of Geneva, and also rector of the academy in the same place.

DECAPITATION, beheading; a punishment of very ancient date, and used among the Greeks and Romans. Hoveden and Florence of Worcester agree that Earl Waltheof, who was beheaded by William the Conqueror in 1075, was the first Englishman who suffered that punishment.

The Messrs. Lysons speak of beheading as an ordinary punishment, in old time, of felons in Cheshire. In France, criminals capitally convicted are now beheaded with the guillotine.

Decapitation, in England, was once the kind of capital punishment inflicted on the higher classes. Henry VIII. beheaded two of his queens. Elizabeth beheaded Mary, queen of Scotland; the High Court of Justice beheaded Charles I.; but the last instance of decapitation in England was in the case of the rebel lords of 1745.

DECAZEVILLE. [AVEYRON.]

DECCAN. [HINDUSTAN.]

DECEMBER. This month still retains the name assigned to it in the first Roman calendar, in which it was the tenth and last of the year. Our Saxon ancestors call it *mid-winter-month*, and *yule-month*, from 'gehweol,' *a wheel*, emblematical of the sun's revolution or return in his annual course.

DECE'MVIRI, or Ten Men, the title of various magistrates or functionaries in ancient Rome. The name is peculiarly applied to a body of ten men who were appointed at Rome to make a code. In B.C. 454, it is said that a commission was appointed to visit Athens for the purpose of getting a copy of Solon's laws, and making themselves acquainted with the institutions of other Greek states. (Liv., iii. 31.) The commissioners having returned at the expiration of two years, another commission, consisting of ten patricians, was named by the comitia centuriata, B.C. 451. Uncontrolled power, both administrative and judicial, without any appeal, and accompanied with the suspension of all other magisterial offices, was conferred on them. Appius Claudius was the leading member of the ten. On the expiration of their year of office, they had framed a body of laws, distributed into ten sections, which were approved by the senate and the centuriata comitia, and engraved on ten tables of metal.

As the new laws were not quite complete, a new commission was named B.C. 450, at the head of which was the same Appius Claudius. (Liv., iii. 35.) But the decemvirs now began to behave in an arbitrary manner, and became very odious. They framed however several new laws, which were approved by the centuries, and engraved on two tables. Their tyranny was overthrown, B.C. 449, by a popular insurrection, caused by the attempt of Appius Claudius to debauch

Virginia, the daughter of Virginius, a Roman officer. She was saved from violation by her own father stabbing her in the public place. Appius Claudius was put in prison, where he died.

The ten tables of the former and the two of the latter decemvirs together form the laws of the Twelve Tables. The Tables comprehended matters both constitutional and applicable to private law. A large part of them only reduced to writing the customary law of Rome. The fundamental principles of this legislation were never formally repealed, and the gradual development of Roman law was founded on and grew out of the Twelve Tables. Some of the fundamental principles still exist in the legislation of Justinian, and have even survived to the present day, such as the doctrine of succession as applicable to testamentary matters, and to cases of intestacy.

(The best essay on the Twelve Tables is by Dirksen, *Uebersicht der bisherigen Versuche zur Kritik und Herstellung des Textes der Zwölf Tafel-Fragmente*, Leipzig, 1824.)

DECHALES, CLAUDE FRANÇOIS MILLIET, was born at Chambery, the capital of Savoy, in 1611. He died in 1678, being then professor of mathematics at Turin.

The works of Dechâles were published at Lyon in 1690, in four folio volumes, under the title of Mundus Mathematicus. A former edition of these was also published in three volumes; but this edition is far less complete than that of 1690, which contains, among other things, valuable prolegomena on the history of mathematics.

DECIMAL FRACTIONS. [ARITHMETIC; FRACTIONS.]

DECIUS CAIUS MESSIUS QUINTUS TRAJANUS, the Roman emperor, succeeded Philip, and chiefly distinguished himself for his violent persecution of the Christians. He and his son fell in an expedition against the Goths, about A.D. 251.

Coin of Decius Trajanus. Brit. Museum. Actual Size. Copper.

Reverse.

DECIZE. [NIÈVRE.]

DECKER, THOMAS, flourished as a dramatic author in the reign of James I., though the precise times of his birth and death are uncertain. Decker composed many plays in union with other dramatists; and the collected works of Webster, Massinger, and Ford exhibit specimens of this partnership-writing, though it is hard to assign the respective portions of productions of this sort to their right authors. Of the plays written solely by Decker, the 'Honest Whore' is the most celebrated, and is printed in Dodsley's collection. Besides his dramatic works, his 'Gull's Hornbook' has become better known by an edition published a few years ago.

DECKER, JEREMIAS DE, one of the most esteemed Dutch poets of the 17th century, was born at Dordrecht, between the years 1608 and 1612. Aided merely by such instruction as his father gave him, young De Decker made so great proficiency, that while yet a lad he made himself master of the Latin, Italian, French, and English languages.

His earliest essays in poetry consisted of paraphrases from Jeremiah, &c., and of translations and imitations from Horace, Prudentius, and Buchanan, to which may be added his 'Good Friday,' a collection of pieces breathing the most pure devotional feeling. The longest of all his productions is his 'Lof der Geldzucht,' or 'Praise of Avarice,' a poem in which that vice is satirised in a strain of most amusing irony. This was the last piece he ever wrote, for he died while it was in the press, in November 1666.

DECKER, SIR MATTHEW, Baronet, was born at Amsterdam, in the latter part of the 17th century, came over to England in 1702, and was naturalised the following year. Having settled as a merchant in London, he rose to great commercial eminence, was made a baronet in 1716, and in 1719 was returned to parliament for Bishop's Castle. He only sat however for four sessions, and his name does not occur in the reported debates. He died March 18, 1749.

Decker is believed to be the author of a little work first published, in 8vo., at London, in 1743, entitled, 'Serious Considerations on the several high duties which the nation in general (as well as its trade in particular) labours under; with a proposal for preventing the running of goods; discharging the trade from any search, and raising all the public supplies by one single tax. By a well-wisher to the good people of Great Britain.' This single tax was to be a house-tax. He has also been commonly supposed to be the author of another more considerable work, first published in 4to., at London, in 1744, and reprinted in 12mo. at Edinburgh, in 1756, under the title of 'An Essay on the Causes of the Decline of the Foreign Trade, consequently of the Value of the Lands of Britain, and on the means to restore both;' but there is good reason for believing that this was not by Decker. It is a rather remarkable work, and has been noticed by Adam Smith and by Mr. M'Culloch.

DECLARATION is the statement of his case by the plaintiff in an action at law. In this, the

first of the pleadings in a cause, the plaintiff states the nature of his case, in general more fully than in the writ, but still in strict conformity with the tenour of that instrument, any substantial variance being a ground of objection. (Co. Litt.; Stephen.)

DECLENSION, a form of the Latin word *Declinatio*, which signifies the various modifications of termination, called Cases, of which a noun is susceptible in the Latin, Greek, and some other languages. Thus, if we take *reg* as the crude form, and add *s*, we have the nominative singular *regs* or *rex;* the genitive is *reg-is*, the dative *reg-i*, the accusative *reg-em*, and the ablative *reg-e:* all in the singular.

As the nouns of the Latin and other languages have considerable variations in the form of declension, it is necessary to distribute these nouns into various declensions; but this has not always been done in the same way. The ordinary Latin and Greek grammars will show how this has been done for the Latin and Greek languages. Professor Key, in his Latin Grammar, has made a division into declensions which is founded on the final letter of the crude form.

DECLINATION. When a star is not in the equator, the angle made by two lines drawn from the spectator's eye, one to the star, the other to the nearest pole, is called its polar distance. The complement of the polar distance, or the angle subtended by the star and the nearest point of the equator, is the declination of the star. It is called north or south according as the star is north or south of the equator.

DECLINATION OF THE MAGNETIC NEEDLE (or *Variation of the Magnetic Needle*), is the angle which the horizontal needle makes with the geographical meridian of any given place.

The Chinese were the earliest observers of the property of the magnet of turning, when poised on its centre, continually in the same direction. In the dictionary of Hiu-tchin, the magnet is described as the 'stone by which we give direction to the needle;' and this refers to the date A.D. 121. Again, under the dynasty of Tsin (which, according to Duhalde, is included between the years A.D. 265 and 419), the great dictionary of Poi-wen-yun-fou says, 'They had then ships whose course was directed by the magnetised needle.'

A passage in the Chinese annals leaves no doubt that this people had in very early times observed the fact of the declination of the needle; for it is there stated that, 'when an iron point is rubbed with the loadstone, it acquires the property of showing the direction of the south; nevertheless, it always declines to the west, and is not due south.' And, after describing the construction of the compass, the passage proceeds to say that the instrument 'indicates the south, but always with a declination towards the point ping' (30° from the south).

The earliest mention of the magnetic declination amongst other than Chinese writers is in a manuscript known as the Adsiger or Leyden Manuscript (1269). This manuscript has been the subject of much discussion; but its authenticity is still greatly doubted.

It has been usual among European writers to refer the discovery of the declination of the needle to Columbus, on his first voyage of discovery in 1492; and, though this is not the fact (see Cavallo's 'Treatise on Magnetism'), it appears from various printed works and manuscripts that the declination was familiarly known very soon afterwards to all the commercial nations of Europe. In 1581 Burrough published his 'Discourse on the Variation of the Compass,' in which he states, as the result of numerous observations, that the declination at Limehouse was 11° 15′ E.; but, in 1633, Gillebrand, the Gresham professor of geometry, found that it only amounted to 4° 5′ E. Careful observations subsequently made have shown that the declination is continually changing, though not with a uniform angular variation: in London, about the year 1657, it was zero, or the magnetic coincided with the geographical meridian; and from that time the northern extremity of the needle has declined towards the west. In 1818, Major, now Lieut.-Colonel, Sabine determined the declination to be 24° 30′ W., and four years afterwards he found it to have retrograded to 24° 12′. It is now an established fact that the western declination is diminishing; and, in the present year, it is less than 23 degrees.

A daily variation of the declination was first observed by Graham in the early part of the last century, and Canton subsequently made a great number of experiments on a subject which he, like Graham, supposed to be collateral with it—the influence of temperature upon the intensity and direction of the needle. These inquiries have been pursued with great success by Professor Christie, of the Royal Military Academy, Woolwich, and M. Kupfer, of Casan. Remarkable results relating to the same subjects have also been obtained by Mr. P. Barlow and by the late Colonel Beaufoy.

Throughout the northern hemisphere the needle attains its maximum easterly variation from the mean declination between eight and nine in the morning: it moves westerly till half-past one in the afternoon, when it attains its westerly maximum. It then returns eastward again till the evening, after which a slight westerly motion succeeds; and this is finally followed by a return easterly during the night, which continues till after eight the next morning, when it is found to be nearly the same as it was twenty-four hours before. These oscillations were found by Colonel Beaufoy (as the mean of five years' observations) to have the greatest amplitude in June and in August. It is certain that the maximum of amplitude is greater in the hotter than in the colder seasons of the year in England, and throughout Europe; and this will probably also be found to be the case in all parts of the world.

The magnetic needle is subject to sudden and extraordinary movements which have been designated by M. Humboldt magnetic storms. The needle then traverses, with a tremulous motion, several degrees on each side of its mean place. This perturbation is often perceived simultaneously over tracts of land and sea to the extent of thousands of miles; or it is propagated gradually

in short intervals of time in every direction over the surface of the earth. One of the most remarkable of these storms is that which was observed Sept. 25. 1841, at the same time at Toronto in Canada, at Prague in Europe, at the Cape of Good Hope, at Macao, and in Van Diemen's Land. (Humboldt's 'Kosmos,' by Sabine, p. 167.)

For the theoretical views which have been proposed to account for the phenomena of declination, see MAGNETISM and TEMPERATURE.

DECOCTIONS are formed by subjecting the harder parts of plants, which are not easily penetrated by liquids, or are insoluble in water of a low temperature, to the process of boiling, generally in water, but sometimes in oil. By this means much of the substance is dissolved, and the active principles of the plant are imbibed by the fluid, which is then used medicinally, either internally or externally. This method of extracting the medicinal properties of plants is inadmissible when their powers depend upon any aromatic or volatile principle, such as essential oils, which are dissipated by the high temperature. In many other instances this process is not only unnecessary, but injurious, being employed when infusion is sufficient, even when cold water is used for the purpose of infusion. The heat is apt to destroy the very principles which are desired to be obtained in many cases; and this process is most suitable to those substances which are both nutritious and medicinal, such as Iceland Moss. Many principles which are dissolved by the water at a boiling temperature are deposited by it on cooling; on which account the liquid should always be strained while hot, and the contents of the bottle shaken up before each dose be poured out. Aromatic liquids are frequently added to the fluid after it is strained; or the aromatic substance may be placed at the bottom of the vessel into which the hot decoction is strained, and, after being allowed to infuse for a few hours, may then be applied to the use intended. A better method however is to add some aromatic tincture after the straining, as the spirit retards the tendency to decomposition, while it imparts the flavour and qualities of the substances from which it had been prepared.

DECOMPOSITION, the resolution, either spontaneously or artificially, of a chemical body into its elements.

DECREE, DECRETALES. The term decree (decretum) denotes a decision or order by a competent power or magistrate, by which some disputed point of judicial inquiry is determined. The term decree is of Roman origin. [CONSTITUTIONS, ROMAN.] It is used in England to express a judgment of the Court of Chancery.

The decrees of the pope, which are called *decretâles*, may be defined as decisions of the popes in matters of ecclesiastical law. The decrees of the popes retained their authority as law till the 14th century, when the power of the holy see began to decline.

From the 5th century the decretales of the popes have been collected; and there are several collections of them. These old collections may be considered as preparatory to the collection of Gratian. [CANON LAW.]

After the time of Gratian many new collections were made. Of these, five collections, which were the most important, and are often called the Quinque Compilationes, were edited together under the title 'Antiquæ Collectiones Decretalium, cum Ant. Augustini et Jac. Cujacii Notis et Emendationibus,' Paris, 1609.

The collections after the time of Pope Honorius III. form parts of the Corpus Juris Canonici. [CANON LAW.]

(J. H. Bœhmer, *De Decretalium Pontificum Romanorum variis Collectionibus et Fortuna*, prefixed to the 2nd volume of his edition of the *Corpus Jur. Can.*)

DECREE. [EQUITY.]

DECREMENT. [INCREMENT.]

DECREPITATION, a series of slight explosions, which occur when certain substances are subjected to heat.

DEDICATION. [CONSECRATION.]

DEE. [CHESHIRE; ABERDEENSHIRE.]

DEE, JOHN, was the son of a wealthy vintner, and born in London, in 1527. At the age of 15 he was entered of St. John's College, Cambridge, where his attention seems to have been chiefly directed to mathematical, astronomical, and chemical studies, and his assiduity was there, as through life, even to extreme old age, truly remarkable. At twenty he made a twelvemonth's tour on the Continent, chiefly in Holland, for the purpose of scientific intercourse, and, returning to Cambridge, was made one of the fellows of Trinity Coll., upon its foundation by Henry the Eighth in 1543; and in 1548, the suspicions entertained of his being addicted to 'the black art' induced him again to go abroad, having first taken his degree of A.M.

His first residence on this second continental visit was the University of Louvain, at that period in high repute as a place of education; and he was much esteemed for his mechanical skill and his intellectual resources, which, combined with his manly character, caused him to be visited by persons of the highest rank. Two years afterwards he went to France, where he read lectures on the Elements of Euclid at Rheims.

In 1551 he returned to England, and was presented to King Edward VI. by Cecil, and a pension of a hundred crowns was assigned to him. This he however relinquished for the rectory of Upton-on-Severn.

Shortly after the accession of Mary, he was accused of 'practising against the queen's life by enchantment;' so that his fame as a dealer in the black art still clung to him. This charge was founded on some correspondence which was discovered between him and the 'servants of the lady Elizabeth;' and it led to a long and tedious imprisonment, with frequent examinations; but, as nothing could be established against him, he was ultimately (1555) set at liberty by an order of the council.

On the accession of Elizabeth, Dee was consulted by Lord Dudley respecting 'a propitious day' for the coronation. The queen, to whom he was presented, made him great promises. In 1564 he again visited the Continent to present a

book which he had written and dedicated to the Emperor Maximilian, under the title of 'Monas Hieroglyphica,' and which he printed at Antwerp in that year; and within the year he returned to England.

He afterwards returned to England, and settled at Mortlake, in Surrey, where he led a life of privacy for some years, devoting himself to study with great ardour, and the collecting of astronomical and philosophical instruments, not omitting of course a sufficient number of beryls, talismans, &c. His reputation as one who dealt with the devil seems to have strongly manifested itself during this time in his own vicinity, as the mob in 1576 assembled, and destroyed all his collection, or nearly so; and it was with difficulty that he and his family escaped the fury of the rabble.

In 1578, the queen being much indisposed, Mr. Dee was sent abroad to consult with the German physicians and philosophers relative to the means to be employed for her recovery. After his return to England he was employed by the queen to draw up an account of those countries which belonged to her crown, on the ground of being discovered by British subjects, both as to geographical description, and the recorded and other evidence upon which her claim rested. With his usual activity he speedily accomplished his task, and in an incredibly short time he presented her majesty with two large rolls in which the discovered countries are geographically described and historically illustrated. These two curious MSS. still exist in the Cottonian Collection in the British Museum. About this time, too, he paid much attention to the reformation of the Calendar, a treatise on which subject by him is still in manuscript in the Ashmolean Library at Oxford.

Most of the proceedings and writings upon which his fame with posterity as an astrologer rests were written subsequent to this period, and he was now upwards of fifty years of age. The belief in supernatural agency was general at that period, and the belief in the power of controlling that agency was equally general, we may say universal. Whether Dee, in the extravagancies which he perpetrated, was himself the dupe of a strong and heated imagination, or whether he made his appeals to the general credulity for some ulterior objects, is difficult to determine.

In the year 1581 he took into his service an apothecary of Worcester, named Edward Kelly, as an assistant. The 'conversations with spirits' were held by Dee in common with this person; and indeed Kelly was in general Dee's amanuensis during the time they were together. They had a black speculum, of what material cannot be ascertained, but it is generally said 'a polished piece of cannel coal,' in which the angels Gabriel and Raphael appeared on their invocation.

The 'Book of Spirits' is not, however, to be considered a fair sample of Dee's absurdity, if taken literally; and we are not sure that Dee was himself the author of it. It was published in 1659, more than half a century after Dee's death; and hence its authenticity is very questionable.

In 1583, a Polish noble, named Albert Laske, palatine of Siradin, being in England Dee, and Kelly were introduced to him; and they accompanied him to Poland. Finding himself abused by their idle pretensions, in order to get rid of them, he persuaded them to pay a visit to Rodolph, king of Bohemia, who, though a weak and credulous man, was soon disgusted with their nonsense, and they had no better success with the King of Poland; but they were soon after invited by a rich Bohemian noble to his castle of Trebona, where they continued for some time in great affluence, owing, as they asserted, to their power of transforming the baser metals into gold.

Kelly appears to have been one of those sordid and servile characters that look only at the immediate gain to be made of each single transaction, without having either principle or honour in his composition. Dee, on the contrary, was, as Lilly in his gossiping memoirs tells us, 'the most ambitious man living, and most desirous of fame and renown, and was never so well pleased as when he heard himself styled Most Excellent.' Dee and Kelly separated in Bohemia, the former returning to England, the latter remaining at Prague.

In 1595 the queen appointed Dee warden of Manchester College, he being then sixty-eight years of age. He resided there nine years; but from some cause not exactly known he left it in 1604, and returned to his house at Mortlake, where he spent the remainder of his days. He died in 1608, aged 81, leaving a numerous family and a great number of works behind him. 'He died,' says Lilly, 'very poor, enforced many times to sell some book or other to buy his dinner with, as Dr. Napier of Linford in Buckinghamshire, oft related, who knew him very well.'

Had Dee lived in better times, his great talents, application, and ambition would have won for him the highest honours. His writings are very numerous, several of which still remain in MS. A catalogue of his printed writings may be seen in his 'Compendious Rehearsal,' or his letter to Whitgift; and from these it appears that he then had by him more than forty unpublished writings, the titles of which he gives.

DEED, an instrument in writing or print, upon paper or parchment, duly sealed and delivered. The name for a deed in the Law French of Littleton and others is *fait*, that is, *factum*, a thing done; of which *deed* is the translation. Deeds are of two kinds, indented and poll: a deed indented is called an indenture, and has a waving line cut teeth-fashion on one of the edges of the material upon which it is written, usually the top edge; and, when the deed consists of more sheets than one, on the first sheet only. The term indenture implies that the deed is of two parts, that is, two parts or copies exactly alike, and that the two parts were divided by the line in order to afford additional means of authentication; but, except in the cases of leases, marriage-settlements, partnership-deeds, and some few others, there are seldom more parts than one. The expense of stamps on deeds is so heavy, that frequently, where two or more parties are equally interested in a deed, it is deposited with some person for their joint use.

A deed poll is cut even, or polled at the edges, and is usually of one part only, that is, the deed

of one party, or of several parties of the same part. The form commences in the mode of a declaration, 'Know all men by these presents, that,' &c. The form of an indenture is, 'This indenture, made, &c. between (here the parties to the deed are named), &c. Witnesseth,' &c. Since the passing of the Act 7 & 8 Vict. c. 76, s. 11, entitled 'An Act to simplify the Transfer of Property,' it is not necessary to indent a deed.

A deed, to be in all respects absolute and irrevocable, must be founded on a valuable or good consideration. [CONSIDERATION.]

Previous to its execution, the deed should be read, if any of the parties to the deed require it. The modern mode of executing deeds is by signing, sealing, and delivery. Signing is not essential to the validity of a deed, though it is required as to less formal instruments by the Statute of Frauds, 29 Ch. II. c. 3; but sealing is absolutely necessary, which is the most ancient mode of authentication, and has been in use from the earliest times. At present the seal is no real security against fraud, for any impression upon wax or other substance employed is sufficient. The last essential to the due execution of a deed is delivery, except in the case of a corporation, where sealing by the common seal has the effect of delivery. The usual manner of delivering a deed is for the executing party to say, 'I deliver this as my act and deed.' The delivery means that the person whose deed (act) the instrument is to be, and who is to be bound by it, delivers it to the person who is to receive some benefit from this deed, or to some person acting for him, and thereby declares that the act is complete. All the parties whose deed (act) the instrument is to be must deliver it as their deed. A deed may also be delivered as an escrow, *i. e.* to a third person to keep till something is done by the grantee: when the condition is performed, the deed becomes effectual. A deed takes effect from the delivery, and not from the date. Enrolment and registration are rendered necessary in some cases by statute, and the revenue laws have imposed certain stamps upon every description of deeds, the absence of which prevents them from being admissible in evidence.

After execution, a deed may become void by erasure, interlineation, or other alteration in any material part; but, generally speaking, such alterations will be presumed to have been made before the execution, if nothing appear to the contrary, or there be no cause to suspect that it has been done in a clandestine manner. A grantee may also disclaim the grant or disagree thereto, and a deed may be destroyed or cancelled; but such destruction or cancellation will not revest the thing granted in the grantor, though all obligations established by the deed between the parties will be put an end to. If the deed has transferred property, the property continues transferred, just as if the deed existed; but, if the seal is destroyed, the covenants which are to be executed are destroyed, because, when any legal proceeding is taken upon the deed, it must be pleaded as a deed, and it is not the deed of the party whose deed it professes to be if that mark is destroyed which is the legal evidence of its being his deed. But as long as the seal is on a deed, and the deed exists entire, so long is the party whose deed it is bound by the covenants. In the case of a bond, which is a deed by which a man binds himself, his heirs, executors, and administrators, to pay a certain sum of money to another at a time named, length of time was formerly no legal bar to an action upon it; yet it was a ground for a jury presuming that it had been satisfied. But by the 3 & 4 Will. IV. c. 42, actions upon specialties, that is, founded upon instruments which are deeds, must be brought within twenty years after the cause of action has arisen.

The effect of the seal remaining is sometimes an unexpected surprise to a man. If a man has taken a lease, for a term of years, of premises, with covenants to repair, and at the expiration of the lease should agree with his landlord to become tenant from year to year, he should get the seal off the lease in the landlord's hands. If he does not, the landlord may still make him repair by virtue of the seal, if he brings his action within the time fixed by law, for the judges have decided that, though tenant from year to year, he is bound by the original covenants.

DEEMSTERS. [MAN, ISLE OF.]

DEER, CERVIDÆ, DEER TRIBE, a family of solid-horned Ruminants, with caducous or perishable horns, belonging, generally speaking, to the male only. Before entering upon a review of this group of mammalia, a few observations respecting the growth and nature of the horns may not be out of place. The horns or rather antlers of the deer tribe are lost and renewed annually, increasing in size and in the number of their branches at each renewal, until a certain period. They are respectively seated upon an osseous peduncle or elevated base rising from each frontal bone, at its central point of ossification: these peduncles are enveloped in skin. 'It is not until the beginning of the second year that the first pair of horns begin to make their appearance. At this epoch a new process commences; the skin enveloping the peduncles swells; its arteries enlarge; tides of blood rush to the head, and the whole system experiences a fresh stimulus. The horns are now budding, for on the top of these peduncles the arteries are depositing layers of osseous matter, particle by particle, with great rapidity; as they increase, the skin increases in an equal ratio, still covering the budding antlers, and continues so to do until they have acquired their due development and solidity. This skin is a tissue of blood-vessels, and the courses of the large arteries from the head to the very extremity of the horns are imprinted on the latter in long furrows, which are never obliterated. In ordinary language the skin investing the antlers is termed velvet, being covered with a pile of fine close short hair. Suppose the antlers of the young deer now duly grown, and still invested with this vascular tissue, but the process is not yet completed. While this tender velvet remains, the deer can make no use of his duly acquired weapons, which are destined to bear the brunt of many a conflict with his compeers; it must there-

fore be removed, but without giving a sudden check to the current of blood rolling through this extent of skin, lest, by directing the tide to the brain or some internal organ, death be the result. The process then is this:—As soon as the antlers are complete (according to the age of the individual), the arteries at their base, where they join the permanent foot-stalk (always covered with skin), begin to deposit around it a burr or rough ring of bone, with notches through which the great arteries still pass. Gradually, however, the diameter of these openings is contracted by the deposition of additional matter, till at length the great arteries are compressed as by a ligature, and the circulation is effectually stopped. The velvet now dies for want of the vital fluid; it shrivels, dries, and peels off in shreds, and the animal assists in getting rid of it by rubbing his antlers against trees. They are now firm, hard, and white, and the stag bears them proudly, and brandishes them in defiance of his rivals. From the burr upwards these antlers are now no longer part and parcel of the system; they are extraneous, and held only by their mechanical continuity with the foot-stalk on which they were placed: hence their deciduous character, for it is a vital law that the system shall throw off all parts no longer intrinsically entering into the integrity of the whole. A process of absorption soon begins to take place just beneath the burr, removing particle after particle, till at length the antlers are separated, and fall by their own weight or by the slightest touch, leaving the living end of the footstalk exposed and slightly bleeding. This is immediately covered with a pellicle of skin which soon thickens, and all is well. The return of spring brings with it a renewal of the whole process, and another pair of antlers branch forth. The common stag begins to acquire his antlers in the spring, and loses them early on the approach of the succeeding spring. His first antlers (second spring) are straight, small, and simple: he is now termed a Brocket. The next pair are larger, and have a brow-antler directed forwards from the main stem, sometimes with one or two small branches above. The third pair have two forward stem-branches besides the brow antlers, and one or two snags at the top. The fourth pair have the brow and stem antlers increased, and still more snags. The fifth and sixth pairs exhibit still greater developments, and an increase in the number of snags. Any disturbance in the system, and especially castration, produces a corresponding deterioration in the form of the horns, distorts them, or checks their development.'—'Pictorial Museum of Anim. Nature.'

Such are the principles upon which the periodical growth and loss of the horns in the *Cervidæ* take place, however the horns of the respective species may vary in size and form. As age comes on, and the energies of the system begin to fail, the horns exhibit a decrease in their complete development; they begin to dwindle, and either become at length simple, or assume an irregular figure, losing their specific characteristics.

The *Cervidæ* in general are furnished with suborbital or lachrymal sinuses. With respect to these sinuses or fissures below the eyes, in so many both of the deer and antelopes, we may remark that their use is not definitely understood. They have no communication with the nasal passages, and have nothing to do with respiration. They secrete a peculiar unctuous fluid, exuding more abundantly at certain seasons than at others, when their edges become very tumid, and are incapable of being closed together as at other times. In several species they are greatly developed. In most species of *Cervidæ* the muzzle is small, flat, and naked; in some, however, as the Elk and Reindeer, it is large and hairy. The females have four teats. Ears moderate; tail short; figure compact; limbs slender, but vigorous. Dental formula:—

$$\text{Incisors, } \frac{0}{8}; \text{ Molars, } \frac{6-6}{6-6}; = 32.$$

The animals of this natural family, so celebrated for their beauty and speed, are spread very extensively, each quarter of the globe having its own species. To this universality of distribution there are certain exceptions. None inhabit Australia, and none have been discovered in the southern and central regions of Africa. Hills of moderate elevation, wide plains and forests, are the localities to which the *Cervidæ* give preference. None inhabit the peaked ridges of the mountain-top, where the chamois finds a congenial abode. They delight in a wide range of country, and trust to their swiftness for safety, until driven to despair. Most herd together in troops—few live singly.

The *Cervidæ* are divided by Colonel Hamilton Smith into the following sections, which have been regarded as natural by many eminent zoologists:—

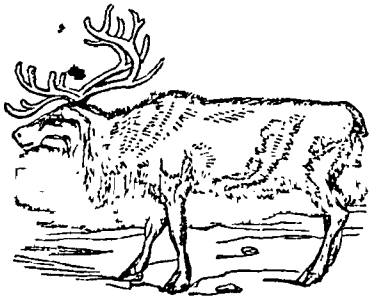
1. *Horns sessile, more or less subdivided, without either basilary or mesial antlers, but terminated by a vast palmation digitated on its external border only.* Genus, *Alces*.—Example, the Elk, Ellan, or Moose-Deer (*Alces Americanus*); Cervus *Alces*, Linn.

Elk (*Alces Americanus*).

This noble species, which stands higher at the shoulders than the horse, is a native of northern Europe and the northern regions of America, granting indeed that the species be identical. In Europe the Elk is thinly spread through the wild

forest regions of Norway, Sweden, Lithuania, and Russia, from the 53rd to the 63rd degree of latitude. It extends also through Asiatic Tartary to the north of China. In North America the Elk or Moose-Deer frequents the woody tracts of the Fur Countries to their most northern limit, and formerly advanced southward as far as the Ohio. For specific details and accounts of habits and manners, see Nilsson; Lloyd's 'Northern Field Sports;' Richardson's 'Fauna Boreali-Americana.'

2. *Horns sessile, more or less subdivided, provided with basilary and median antlers; the antlers flattened. In the female as well as the male.* Genus, *Rangifer*.—Example, the Reindeer (*Rangifer Tarandus*); *Cervus Tarandus*, Linn.; *Cervus Rangifer*, Brisson.



Reindeer *Rangifer Tarandus*).

The Reindeer is spread through the Arctic regions of Europe, Asia, and America, the wilds of the Polar Circle being its congenial abode. The finest animals are those of Finmark, Lapland, and especially Spitzbergen, those of Norway and Sweden being inferior in strength and stature. In Asia it extends farther to the south than in Europe, ranging along the Ural chain to the foot of the Caucasian Mountains. It is common through the northern latitudes of Siberia, and abounds in Kamtchatka. In the Fur Countries of North America and the Polar regions, this animal is called Caribou. Dr. Richardson describes two distinct varieties: one he calls the Barren-Ground Caribou, the other, the Woodland Caribou, the latter being much the largest. (Sir Arthur De Capell Brooke's 'Winter in Lapland;' Hoffberg, 'Amœnit. Acad.,' vol. iv.; Richardson's 'Fauna Boreali-Americana;' Appendix to Sir John Ross's 'Last Voyage,' &c.)

There is reason to believe that formerly the Reindeer not only inhabited the Hyrcinian Forest (Cæsar's 'Commentaries'), but other portions of Middle Europe. Fossil horns of a species of *Tarandus* occur in the superficial deposits.

3. *Antlers commencing with a round stem, and gradually merging into a broad digitated palmation.* Genus, *Dama*.—Example, the Fallow-Deer (*Dama vulgaris*, Gesner; *Cervus Dama*, Linn.). This species, kept in parks in England, and so much esteemed for its flesh, is a native of Europe and some parts of Asia, and also of northern Africa. We have examined horns of the wild Fallow-Deer brought from Tunis. At one time the Fallow-Deer wandered wild in our country as the Red-Deer still does in the mountain districts of Scotland. When Pennant wrote, these animals were, according to him, scarcely known in France, but were sometimes found in the north of Europe. In Spain, he observes, they are extremely large, and states that they are met with in Greece, the Holy Land, and in China. For the two latter localities he quotes Hasselquist (who says he saw them on Mount Tabor) and Du Halde. Pennant goes on to state that, in every country except our own, these deer are in a state of nature unconfined by man; but they are, and for some time have been, confined in parks on the Continent, as they are in England. They are said to be found wild in Moldavia and Lithuania. This species is the *Dama* of the Romans.

4. *Horns round and branching; three antlers produced from the brain, viz. the brow-antler, the bez-antler, and the antler royal; besides the snags or crown (sur-royal) in which the beam terminates. The brow-antler is often double.* Genus, *Cervus*.—Examples, the Common Stag (*Cervus Elaphus*), with its allied species, the Barbary Stag, and the Persian Stag; the Wapiti of Canada and the plains of the Saskatchewan (*Cervus Wapiti*, Mitchell; *C. Canadensis*, Briss.; *C. strongyloceros*, Schr; the *Cervus Elaphoïdes*, and the *C. Wallichii* of Nepâl.)

5. *Horns rugged and cylindrical, with a large sharp brow-antler, but no bez-antler, the beam bifurcating at the top into a sharp anterior and posterior snag.* This group is generally called the *Rusa* tribe. Genus, *Rusa*.—Examples, the Sambur of India (*Rusa* (*Cervus*) *Hippelaphus*); the *Cervus Aristotelis*, termed Elk by the British sportsmen of India; the *Cervus equinus*, *C. unicolor*, *C. Peronii*, and many more species peculiar to India and its islands.

6. *With horns differing little in general characters from those of the Rusa tribe, but exhibiting certain distinctive features in other points, fully entitling them to the rank of a section in the family of Cervidæ.* Genus, *Axis*.—Examples, the Axis-Deer (*Cervus Axis*, Erxl.), the Hog-Deer (*C. porcinus*), and a species described by Mr. Ogilby in the 'Proceeds. Zool. Soc.,' 1831, under the title of *C. nudipalpebra*.

7. *Horns small, cylindrical, and rugged, and, when fully developed, divided above into three snags, of which the largest is seated anteriorly. No suborbital sinuses.* Genus, *Capreolus*.—Examples, the Roebuck (*Cervus Capreolus*, Linn.), and the Roe of Tartary (*C. pygargus*, Pallas).

The Roebuck is the least and one of the most active and beautiful of our European deer. Wild, sly, and cautious, it does not herd in troops, but lives singly, or in small companies, consisting of the male, female, and young; the latter being generally two, sometimes three in number. These remain eight or nine months with their parents, which continue attached to them for life. The roe is more cunning than the stag, and when hunted will endeavour by various subtle artifices to elude its pursuers. It will wind and double on its track, then take bounds of surprising extent, and lie

close amongst the herbage of its covert till the dogs, having lost the scent, pass off to a distance. The flesh of the Roebuck is not in high estimation.

8. *Horns rough, with a cylindrical stem, and slightly compressed branches, which have a tendency to form arches or segments of a circle; of these an anterior branch projects somewhat forwards. The stem sweeps outwards, curving inwards and forwards at its extremity, which divides into two or three branches. Suborbital sinuses small.* All American. Genus, *Mazama*.—Examples, the Virginian or American Fallow-Deer (*Cervus* (*Mazama*) *Virginianus*), the Black-Tailed Deer (*Cervus Macrotis*, Say,) the White-Tailed Deer (*C. leucurus*), &c.

9. *Horns simple, consisting of a single slender stem without snags or branches.* All South American. Genus, *Subulo* (Brocket).—Examples, the Guazu-pita (*Subulo rufus*), the Guazu-bira (*S. nemorivagus*), and the Apara Brocket (*S. simplicicornis*).

10. *Horns supported on a long slender osseous pedicle, continued from the frontal bone, and covered with skin; horns small; those first obtained are simple; the second have a small basal prong. Canines in the upper jaw of the males.* Locality, India and the Indian Islands.—Genus, *Stylocerus*.

The species composing the present group are but imperfectly known. Colonel H. Smith enumerates five, of which two however are doubtful. The most familiar example is the Muntjak of Java and Sumatra, the Kidang of Horsfield (*Stylocerus Muntjak; Cervus Muntjak*, Schreb.).

Muntjak (*Stylocerus Muntjak*).

This species equals a roe in size; its favourite haunts are hills covered with brushwood, elevated grounds adjacent to wild forests, or shrubby spots between the forests and the cultivated lands. Its voice resembles the barking of a dog. The Muntjak is hunted for the sake of its flesh, which is greatly esteemed; it is also taken in snares and traps. When brought to bay, the male defends himself with great resolution.

Fossil Deer.—The remains of deer are sufficiently numerous in beds of the third period of the tertiary series and in caverns. Thus in the cavern of Kirkdale Dr. Buckland found evidences of at least three species, the smallest being nearly of the size and form of the fallow-deer, another equalling the red-deer, and a third of very large stature. Remains of deer occur in the fossiliferous caverns of Germany, with the bones of the hyæna and rhinoceros.

In the peat and marl of Ireland, and the Isle of Man, are found, often in abundance, the bones of the fossil Elk, as it is erroneously called. This extinct species belongs to the *Dama* group, but far exceeded the fallow-deer in stature. The skeleton in the museum of the Royal Society at Dublin measures in height to the top of the back 6 feet 6 inches; and the distance between the tips of the horns measured by the skull is 11 feet 10 inches.

Though most abundant in Ireland, the bones of this gigantic species are also found in recent deposits in England, and have been dug up in France, Germany, and Italy, where, according to Cuvier, they occur in the same strata with the bones of elephants. A noble specimen of the *Cervus megaceros* graces the British Museum.

Captain Cautley, in his paper 'On the Remains of Mammalia found in the Sewalik Mountains, at the southern foot of the Himalayas, between the Sutlej and the Ganges,' enumerates among the collection of bones obtained by him those of several species of *Cervidæ*. Professor Kaup discovered the bones of at least four species of deer in the sand resting upon the Calcaire grossier in Rhenish Hesse, in company with the Dinotherium, &c. Deer therefore may be considered to have existed in the second and third tertiary periods, viz. the Miocene and Pliocene periods of Lyell.

DEFAMATION is the speaking slanderous words of a person. The injured party may bring an action to recover damages; but to enable him to succeed it is necessary that the words should contain an express imputation of some crime or misdemeanour which would make him liable to punishment, or, if the words are not actionable in themselves, some special damage should be proved to have resulted from them to the plaintiff.

There are certain cases however where words are spoken of a tradesman or professional person in the way of his trade or profession, as that a tradesman is insolvent, or that an attorney deserves to be struck off the roll, in which the plaintiff, by reason of the character he fills, may recover damages. Defamation is also punishable in certain cases by indictment and criminal information. Where the slanderous matter is spoken of a peer, the offence is termed scándalum magnátum, and is punishable by various statutes: but this mode of proceeding may be said to be obsolete.

The ecclesiastical courts have power to punish for defamation relating simply to spiritual affairs: but these courts can only inflict punishment by way of penance; they cannot award damages.

(Selwyn, *Nisi Prius*.) [LIBEL; SLANDER.]

DEFEAZANCE (from the French verb *défaire*, to make void) is an instrument which defeats the force or operation of some other deed, estate, or interest, upon the performance of certain conditions. Defeazances are of two kinds, the one applicable to freehold estates; the other, to terms of years and executory estates, and to recognizances, bonds, and other executory interests.

The former must be a collateral deed made at the same time with that to be defeated, and forming part of the same transaction. In this manner mortgages were formerly made, the mortgagor enfeoffing the mortgagee, and at the same time executing a deed of defeazance. Defeazances are now rarely used as applicable to titles, it being much better to make the conditions apparent on the deed itself. (See Lord Talbot's 'Remarks in Ca. Temp. Talb.,' p. 64.)

The latter kind of defeazances may be made either at the time of the original transaction, or afterwards. It has been said that every defeazance must be made by deed: but other authorities have laid down that it need only be by means as high and solemn as the instrument to be defeated.

By the Stat. 3 Geo. IV., cap. 39, defeazances to warrants of attorney and cognovits must be written upon the same paper or parchment as the instruments themselves.

DEFERENT, a circle or oval curve on which the centre of another oval moves, while a planet is supposed to move round the latter. The term is one of the Ptolemaic hypotheses. [PTOLEMAIC SYSTEM.] Thus the earth's orbit, to choose an example out of the modern system, is a deferent on which the moon's orbit is carried.

DEFFA'NT, MARQUISE DU. *Marie de Vichy Chamroud* (commonly known as the *Marquise du Deffand*), was descended from a noble family in Burgundy, and was born in 1696. She had natural parts, wit, playfulness, and taste, which her education tended to stimulate. In 1718 she married the Marquis du Deffant. Having some time after separated from her husband, she had her own establishment, her parties, her admirers, and her petits soupers. She numbered among her friends and correspondents some of the most distinguished men of France, such as President Henault, Montesquieu, Marmontel, D'Alembert, Voltaire, &c. In the later years of her life, being afflicted with blindness, she took as a companion and reader Mademoiselle de Lespinasse; but she afterwards became jealous of her, and they parted; on which occasion Madame du Deffant quarrelled with D'Alembert also. She continued, though blind, to correspond with her friends, and especially with Voltaire and Horace Walpole, to a very advanced age. She died in September 1780, in her eighty-fourth year. Madame du Deffant possessed some very valuable qualities: she had real wit and taste, without affectation, and much tact and sound judgment, whenever caprice or prejudice did not lead her astray. She had a quick perception of merit of every kind, and, although a free-thinker, she never partook of that absurd fanaticism against religion which characterised some of the philosophic writers of the eighteenth century.

DEFILADING, is that part of fortification the object of which is to determine (when the intended work would be commanded by eminences within the range of fire-arms) the directions or heights of the lines of rampart or parapet, so that the interior of the work may not be incommoded by a fire directed to it from such eminences.

The plan of a work which is open towards the rear being given, if it be required to determine the heights of a rampart or parapet in different places, so that the interior may be protected from the fire of the enemy on a commanding eminence beyond, the relative heights of the principal inequalities of the ground with respect to some horizontal plane, technically called the plane of comparison (which generally passes through the highest or the lowest point), must be found by the spirit level. An oblique plane, technically called the plane of site, must be imagined to touch the summit of the eminence in front, to pass above all the intermediate ground, and to meet that in rear of the work; then the relative heights, with respect to the plane of comparison, of the several points in the plane of site which are vertically above the inequalities before mentioned of the natural ground, must be computed, and the differences (which express the heights of the plane of site above the natural ground in such places) being added to the given height which the rampart or parapet is to have above the plane of site, the sums will express the heights to which the works are to be raised above the natural ground at the same places.

When the work is of small importance, the elevations of the parapets above the ground are generally determined by the eye, thus:—Pickets are planted in convenient places, chiefly at the angles of the intended work (the plan of which has been already traced on the ground), and on the summit of the commanding eminence, the picket in this place being about eight feet high. The visual rays being supposed to proceed from the top of this picket to two or more points, which must be also eight feet above the ground, in rear of the work, the intersections of these rays with the pickets planted on the magistral or ground line of the work, will show the heights to which the parapet is to be raised at those places in order that the interior may be effectually protected.

A similar process is employed when it is required to protect the defenders of any post which is quite surrounded by a parapet from the fire of the enemy on commanding eminences both in front and rear; in which case it is frequently necessary to raise in the interior of the work a mass of earth, which is called a traverse or a parados, according to its situation.

DEFILE, in military writings, is a name given to any narrow way. Every piece of ground which, in consequence of local impediments, can be passed by a column only on a narrow front, is called a defile. Such are roads along valleys, between walls or hedges, or over dykes raised across marshes. Sometimes also the term is applied to a street in a village, and to the path over a small bridge.

DEFINITION (*definire*, to mark out a boundary) is the process of stating the exact meaning of a word, by means of other words.

DEFLAGRATION, the sparkling combustion of substances without violent explosion.

DEFLECTION, a term applied to the distance by which a curve departs from another curve, or from a straight line; and also to any effect either of curvature or of discontinuous change of direction. It is used where any 'bend-

ing off' takes place, which is in fact the etymological meaning of the word.

DE FOE, DANIEL, the son of James Foe, was born in London, in 1661. Of his youthful years we have nothing particular to relate. His father was a Dissenter, and Daniel was educated at a Dissenting academy at Newington Green. De Foe first appeared as an author in 1683, when he published a political pamphlet on the war that was then carried on between the Austrians and the Turks; and two years afterwards his zeal for the maintenance of Protestantism induced him to join the Duke of Monmouth, but he had the good fortune to escape the fate that numbers of his companions suffered. De Foe was for some years engaged in trade, first as a hose-factor and wool-dealer, and then on the banks of the Thames, in the neighbourhood of Tilbury Fort, in a manufactory of brick and pantiles, which, until then, had always been imported from Holland. His efforts in trade however were not successful: he became a bankrupt, but by the most honourable exertions all his creditors were ultimately satisfied. In the beginning of 1700 he published the 'True-Born Englishman,' a poem, which so pleased King William, that he admitted the author to an audience, and bestowed on him the more substantial reward of a present of money. Soon after the accession of Anne, he published a pamphlet, called 'The shortest Way with the Dissenters,' which gave bitter offence to many powerful bodies in the state. The high church party resented it as a libel; the Dissenters considered the author serious; the House of Commons (on Feb. 25, 1702-3) ordered the pamphlet to be burnt by the common hangman; and the secretary of state offered a reward of 50*l.* for his apprehension, describing him as a middle-sized spare man, about forty years old, of a brown complexion, and dark brown hair, but wearing a wig; a hooked nose, a sharp chin, gray eyes, and a large mole near his mouth. He was shortly after caught, fined, pilloried, and imprisoned. 'Thus,' says he, 'was I a second time ruined, for by this affair I lost above 3500*l.*' During the time that he was confined in Newgate he wrote an 'Ode to the Pillory,' and matured a scheme for 'The Review,' a paper exclusively written by himself, which for more than nine years he continued to publish twice or three times a week. After he had been a prisoner for more than a year, he was released, and in 1706 he was recommended by Lord Godolphin to the queen as a fit and proper person to send to Scotland to promote the Union; and for his services in this mission he had a pension for a short time. His political writings again got him into difficulties; for the publication of two papers, one entitled 'What if the Queen should die?' the other called 'What if the Pretender should come?' he was fined 800*l.*, and, in default of payment, again committed to Newgate. His second was not so long as his first imprisonment; he was liberated by the queen in November 1713.

After the death of Anne in 1714, his enemies so assailed him that his health gave way. When he recovered, he continued to write, but thought it prudent to enter upon a new field. He now put forth the first part of his inimitable 'Adventures of Robinson Crusoe,' which no story has ever exceeded in popularity. The great success of the first induced him to write a second and third part, each of which had less merit than its predecessor. 'The Adventures of Captain Singleton,' 'The Fortunes of Moll Flanders,' 'The History of Colonel Jack,' 'The Fortunate Mistress,' 'The Memoirs of a Cavalier,' and 'The History of the Plague,' were among the most popular of his works that succeeded 'Robinson Crusoe;' but these form only a small portion of his writings. His biographers, Chalmers and Wilson, have published catalogues of the writings of De Foe; but it is very probable that they are incomplete, and that many of his works which were only of a temporary interest have been lost.

De Foe died in London, April 24, 1731, aged seventy.

DEGREE of Latitude, &c. [GEODESY.]

DEGREE. [ARTS, DEGREES IN.]

DEGREE OF AN EQUATION. The degree of an algebraical term is the number of letters which enter into it as factors. Thus $x^3 y^3$ is absolutely of the fifth degree, but of the second degree with respect to x, and of the third with respect to y. The degree of an equation is the degree of its highest term.

DEIFICATION. [APOTHEOSIS.]

DEIO'TARUS, a tetrarch or prince of Galatia, or Gallo-Græcia, was the ally of Rome in the wars against Mithridates, for which he was rewarded by the grant of part of Pontus and Little Armenia, with the title of king given to him by the Roman senate. Cicero, during his government of Cilicia, became acquainted with him. In the civil war between Cæsar and Pompeius, Deiotarus took part with the latter, and was in consequence deprived by Cæsar of part of his dominions. After Cæsar's return from Spain, Deiotarus was accused by his own grandson, Castor, of having attempted to assassinate Cæsar, while he was in Asia. Cicero pleaded before Cæsar in favour of his old friend, in an oration which is extant ('Oratio pro Rege Deiotario'). After Cæsar's death, Deiotarus recovered possession of his territories; he took part with Brutus against the triumvirs, but afterwards made his peace with them, and subsequently favoured Octavianus Cæsar against Antonius. The time of his death is not known.

DEIRA. [ENGLAND.]

DEISM properly means belief in the existence of a God, but is generally applied to all such belief as goes no farther, that is to say, to disbelief of revelation. It is frequently used merely as a term of reproach.

DEKKER. [DECKER.]

DELAMBRE, JEAN BAPTISTE JOSEPH, was born at Amiens, Sept. 19, 1749. His course of study was at the gymnasium of his native town.

Delambre was desirous of pursuing his studies in Paris, but his pecuniary means were inadequate to the expenses in which he would be necessarily involved by such a course. The influence of Delisle however procured for him an

exhibition to one of the colleges which was in the gift of his native town, and which it has been commonly said was first founded by one of Delambre's own family. The time during which he was entitled to hold it having expired, and his family being unable to furnish him the requisite assistance to prolong the period of his studies, he was compelled to adopt some means of supporting himself. After more than a year of disappointment, indecision, and privation, he undertook the occupation of translating foreign works into French; and many such translations from the Latin, Greek, Italian, and English writers were executed by him during the first fifteen years after he left college. In addition to this employment, he gave lessons in languages to private pupils; and, by the combined emoluments of these labours, he was not only able to supply his small personal wants, but to make an excellent collection of the best authors, in the several languages which he studied.

The parsimonious views of parents on the subject of education have been witnessed by every one whose life has been devoted to instruction, under circumstances similar to those of Delambre. Their continual importunity to men eminent in some one pursuit, whom they have employed, to undertake others with which they have little or no acquaintance, and this for the sake of diminishing the expense of education, is proverbial. It was this continual application to Delambre, who was distinguished both in the philological and philosophical departments of language, to teach mathematics, which induced him, at the age of twenty-five, to enter upon the study of the exact sciences. Most men would have been soon wearied of a pursuit so undertaken; and this would have been the case with Delambre, had his mental discipline been merely that of exercising the memory, which is unfortunately too much the tendency of the exclusive study of languages. Order and perseverance were distinguishing characters of Delambre's mind; and having, from professional motives, entered on the study of mathematics, and thereby become attached to their pursuit, he determined to pursue a regular course of study in these sciences. He entered the astronomical class of the College of France under Lalande, but not till he had carefully read the works of his master, and made many notes upon them, amounting almost to a commentary.

On one occasion, shortly after he joined the class, a passage from Aratus was required, which Delambre instantly supplied from memory. Lalande, ever alive to the importance of astronomical history, was immediately interested in Delambre; and it is probable that to this circumstance much of the future fame and labours of Delambre are to be attributed, as Lalande became immediately his friend, and henceforth considered Delambre as his follow-labourer. Many of the most complicated calculations of Lalande were actually performed by Delambre; but, though our author probably entered upon much of this drudgery for pecuniary considerations, he has given ample proof that the labour was far from a disagreeable one to him, by the tables which he himself subsequently published in later life.

During a short residence at Compiègne, which he made while he was a professed teacher of languages, he appears to have paid some attention to plane astronomy; and when he formed a friendship with Lalande, M. Dassy, in whose family Delambre was domiciled as tutor to his sons, was prevailed on by the astronomer to fit up a small observatory for his use. In this Delambre acquired some skill in the manipulation of his instruments, and also in the management of the formulæ which are used in the particular classes of data that the structure of instruments enables us to obtain. He then determined to devote his life to astronomy, and its history.

When the project of fixing a standard of length was acceded to by the governments of France and England, Delambre and Méchain were appointed to carry it into execution on the part of the former government, by measuring the arc from Dunkirk to Barcelona. This laborious undertaking was carried on during the horrors of the French Revolution, amidst almost every variety of difficulty and personal danger that can be conceived. Méchain dying during the progress of the work, the completion of it devolved wholly on Delambre. His perseverance, prudence, and zeal, however, eventually overcame all obstacles; and, after eight years of unceasing labour and anxiety, he obtained the measurements which constitute the data of the three volumes (1806–10) of his elaborate and invaluable work, 'Base du Système Métrique Décimal.' The Institute of France, who had watched over its progress, decreed him the prize for the most valuable work on physical science which had appeared within the preceding ten years; and it is difficult to conceive that a single objection could possibly arise to the propriety of that decision.

But the works by which Delambre is most known are his 'Histories of Astronomy,' subdivided into ancient, middle, modern, and of the eighteenth century (left unfinished). These are altogether in 6 quarto volumes, published from 1817 to 1827, and contained by far the grandest effort which has ever been made towards the history of this branch of science.

The death of Delambre occurred in 1822, at the age of 72. It was preceded by a total loss of strength and frequent and long-continued fainting fits, with the other symptoms of a constitution worn out by hard mental and bodily labour. He died as he had lived, calmly, and, though not without great suffering, yet without a single complaint.

DELAWARE, a river in the United States of North America, rises in the State of New York, between 42° and 42° 30′ N. lat., and afterwards forms the boundary line between New York and New Jersey on one side, and Pennsylvania and Delaware on the other side. It terminates its course of 305 miles about five miles below New-Castle in Delaware, about 39° 30′ N. lat., and 75° 40′ W. long. The Delaware is formed by two branches, both of which rise on the western declivity of the Catskill Mountains, at an elevation

of at least 1500 feet above the sea. Both branches flow W.S.W. for about 50 miles, and unite on the boundary of Pennsylvania, the northern branch turning suddenly to the S.E. In the same direction the river, now called Delaware, continues about 60 miles to the junction of the Neversink, whence it runs S.W. and S. to the junction of the Lehigh at Easton, 65 miles, where it again turns to the S.E. After a course of 35 miles in that direction to Bordentown, it resumes its S.W course to the place where it enters Delaware Bay, 5 miles below New-Castle. The tide ascends in this river 120 miles from its mouth to the rapids at Trenton. Ships of the line may ascend to Philadelphia, where the tide rises five or six feet, and sloops as far as Trenton.

DELAWARE, one of the United States of North America, next to Rhode Island the smallest in the Union, is bounded N. by Pennsylvania, E. by Delaware River, Delaware Bay, and the Atlantic Ocean; S. and W. by Maryland. It lies between 38° 29′ and 39° 47′ N. lat., and between 74° 56′ and 75° 40′ W. long. Its greatest length is 92 miles, and greatest breadth 23 miles. The area is 2120 square miles, or 1,356,800 acres. The population in 1840 was 78,085, of whom 2605 were slaves.

The northern part of the State is hilly, and the soil a strong clay; the southern part is low and sandy, and in this part the Cypress Swamp, 12 miles from N. to S., and 6 miles from E. to W., is covered with trees, and supplies much timber. The soil of the middle part of the State is clay mixed with sand, and in some parts is very fertile. Wheat, flour, and timber are the chief articles of export.

The rivers are small, and the coast is low, and has no good natural harbours except at Wilmington, where Brandywine Creek unites with Christiana Creek; but in front of Lewiston, near Cape Henlopen, an artificial harbour has been several years in progress of construction, formed of a breakwater 3600 feet long, and an ice-breaker 1500 feet long.

The Chesapeake and Delaware Canal crosses the northern part of the State, and is navigable for sloops 13½ miles from Delaware, on Delaware River, to Back Creek and Elk River, which extend the navigation into Chesapeake Bay. The New-Castle and Frenchtown Railroad extends 16 miles from New-Castle to Frenchtown, on Elk River.

The State of Delaware has no public debt. It has a school-fund of about 174,000 dollars, and expends about 32,000 dollars annually for schools. Newark College, at Newark, had, in 1846, 7 instructors and 112 students.

Dover, situated on Jones's Creek, 7 miles from its entrance into Delaware Bay, and 47 miles S. from Wilmington, is the seat of government. The streets are wide, and the houses well built of brick. The state-house is a handsome building. Population in 1840, 3790.

Milford, on the north side of Mispillion Creek, 21 miles S.E. from Dover, had in 1840 a population of 2356.

New-Castle, 5 miles S.S.W. from Wilmington, on the Delaware River, had in 1840 a population of 2737, and the shipping amounted to 3661 tons.

Wilmington, a city and port of entry, is situated between Brandywine Creek and Christiana Creek, 1 mile above their junction, 2 miles from Delaware River, and 47 miles N. from Dover. The streets are wide, and the houses generally of brick. The population in 1840 was 8367, and the tonnage 16,110. Christiana Creek is navigable to the city for vessels drawing 14 feet of water, and on Brandywine Creek are some of the finest flour-mills in the United States, to which vessels drawing 8 feet of water can come.

The State is governed by a governor, 9 senators, who are elected for four years, and 21 representatives, who are elected for two years. It sends two senators and one representative to Congress.

This country was first settled by the Swedes, whom Gustavus Adolphus sent there in 1627. In 1655 it passed into the hands of the Dutch, who ceded it in 1664 to the English. Its name is derived from Lord Delaware, the governor of Virginia.

(Haskel and Smith, *United States' Gazetteer*; *American Almanac* for 1847.)

DEL CREDERE COMMISSION. [AGENT.]

DELEGATES, COURT OF, was the great court of appeal in ecclesiastical causes, and from the decisions of the Admiralty Court.

By 2 & 3 Will. IV. c. 92, the Court of Delegates was abolished, and its powers were transferred to the king in council.

DE'LFICO, MELCHIORRE, born at Teramo, in the Abruzzo, in 1744, studied at Naples under Genovesi, Mazzocchi, and other learned teachers, and applied himself particularly to the study of the law and of political economy. After his return to his native country he published his first work, an essay in defence of matrimony, against some loose opinions of the time, 'Saggio Filosofico nel Matrimonio,' 1774; thenceforward he continued to produce works devoted to the improvement of his country, and had the satisfaction of witnessing the adoption of many of his plans. The following were the most important of these:—'Memorie sul Tribunale della Grascia e sulle Leggi Economiche nelle Provincie confinanti del Regno;' these Memoirs being addressed to the king had also the effect of removing the obnoxious restrictions on the sale and exportation of rural produce: a Memoir, in 1787, against the abuse of the winter transmigration of sheep from the highlands to the maritime districts of the Abruzzo, by which a large tract of fertile land was kept out of cultivation: and another, in 1788, on the like practice in the plain of Apulia: a work in favour of the free sale of fiefs which reverted to the crown at the extinction of baronial families, 'Riflessioni sulla Vendita dei Feudi,' 1790: and 'Lettera al Duca di Cantalupo sù i Feudi devoluti,' 1795; soon after which a law was issued for the sale of feudal estates, which had reverted to the crown, as allodial property.

When Joseph Bonaparte became king of Naples, in 1806, Delfico was made councillor of state, and contributed to the new judiciary organi-

sation of the kingdom, and other useful measures. On the restoration of King Ferdinand, in 1815, Delfico was made president of the commission of the archives. In 1823 he tendered his resignation on account of his great age, and the king allowed him a handsome pension for life. He left Naples, and returned to his native Teramo, where he resided till 1835, when he died at the age of ninety-one.

Besides the works mentioned, we may notice 'Ricerche sul vero Carattere della Giurisprudenza Romana, e de suoi Cultori,' 8vo., 1791, a work that has been reprinted several times; and 'Pensieri sù la Storia e sù la Incertezza ed Inutilità della medesima,' 8vo., Forli, 1806, also reprinted several times; in which he anticipated Niebuhr in his scepticism concerning the legends of the early ages of Rome, and he repeats the absurd assertion of his countryman Vico, who said that the Roman people, until the second Punic War, knew no other arts but those of digging the ground and cutting the throats of their neighbours.

DELFT, a large town in the province of South Holland, 8 miles N.W. from Rotterdam, is an ancient and gloomy place on the Schie, with 15,000 inhabitants. Many of the streets are divided by narrow stagnant canals; in the centre of the town are two handsome streets with broad canals and shaded with trees. The greater part of the country-houses inhabited by the wealthy merchants of Rotterdam are situated on the banks of the canal near Delft. This town was formerly famous for its pottery, to which it gave its name; but this manufacture has been supplanted even in Holland by the superior pottery of England; the earthenware of Delft is now of the coarser kind, and not more than 200 persons are employed in the manufacture. The principal buildings are—the New Church, which contains the monuments of Grotius and William I., prince of Orange, who was murdered at Delft, July 10, 1584; the town-house, which stands on one side of a large market-place, and opposite to the new church; and the Old Church, which contains the tombs of Leuwenhoeck the naturalist, and Admiral Van Tromp. At the entrance of the town, on an island formed by canals, is the State Arsenal of Holland, formerly the Dutch East India House. Manufactures of woollen cloths and tobacco-pipes are carried on. There is also a considerable trade in butter.

DELHI, formerly a large province, of Hindustan, which extended N. and N.W. to the base of the Himalaya Mountains and to Loodiana on the Sutleje, and was bounded E. by Oude, S. by Allahabad, and W. by Agra and Ajmeer. [HINDUSTAN.]

Delhi is now one of the six administrative divisions of the North-Western Provinces, and includes only a small portion of the former province of Delhi. The area is 8305 square miles, or 5,315,159 acres, of which 2,410,266 acres are under cultivation, 1,896,134 not cultivated, and 533,899 barren. The population in 1846 was 1,488,556.

(*Journal of the Statistical Society of London, Sept. 1847.*)

DELHI, a city of Hindustan, in the North-Western Provinces, capital of the province of Delhi, and formerly the imperial residence of 'the Great Mogul,' is situated on the western bank of the Jumna, in 28° 40′ N. lat., 77° 15′ E. long. The site of the present city is a rocky elevation. Including the suburbs, it is about seven miles in circuit; but the ruins of the ancient city extend to the S.W. over a sandy, rocky, and barren plain. The present city was founded by the Emperor Shah Jehan in 1631, and he gave it the name of *Shahjehanabad*, 'the colony of Shah Jehan,' which name is still used in written documents presented to the King of Delhi, but rarely on any other occasion.

The old lofty wall of the city with its flanking towers has been superseded by ramparts of red granite, with massive bastions, a moat, and glacis. The gateways of the city are magnificent. The principal streets are wide, handsome, and, for an Asiatic city, very clean, but the dust which rises at certain seasons is suffocating. Many of the houses are large and high, and the mosques, with their lofty minarets and gilded domes, are numerous; but the most striking and most elevated structure is the imperial palace, a large collection of Gothic buildings, with towers and battlements. It was built by the Emperor Shah Jehan, and the magnificence of the courts which he held within it, when he sat upon his jewelled 'peacock-throne,' have perhaps not been equalled at any other time or in any other place. The palace is surrounded by a high wall, embattled and machicolated, with small round towers, and two noble gateways, each defended by an outer barbican; the whole of red granite, inlaid with white marble in the ornamental parts. The general style of the architecture is simple and impressive, and reminded Bishop Heber of Caernarvon Castle. Acbar II., king of Delhi, the reigning descendant of the emperors of Hindustan, resides in the palace, and receives a revenue from the British government. The Jumna Musjeed, the chief mosque, is the largest and handsomest place of Mohammedan worship in India. In front of the mosque is a large square court, with a fountain in the centre, and surrounded by a cloister open on both sides, and commanding a view of the whole city. The mosque itself is entered by three lofty Gothic arches surmounted by three domes of white marble, and it has a tall minaret at each end.

The Jumna is so strongly impregnated with natron from the extensive beds which it passes over before it reaches Delhi, as to be entirely destructive of vegetation as well as unfit for drinking. To supply the city with pure water, Ali Merdan Khan, a Persian nobleman in the service of Shah Jehan, constructed an aqueduct or canal, which received the pure water of the Jumna not far from its sources in the mountains, and conducted it 120 miles to Delhi, giving fertility to the country near its banks, becoming the chief source of vegetation to the gardens of Delhi, and furnishing the inhabitants of the city with almost the only drinkable water within their reach. During the troubled times which attended the decay of the power of the emperors of Hindustan, the canal was neglected, the water was cut off,

and the inhabitants were obliged to supply themselves as well as they could from wells. The canal remained in a ruinous state till it was repaired by the British government, and reopened in 1820, when the whole population of the city went out in jubilee to meet the coming stream, into which they threw flowers and other offerings, and invoked blessings on the British for the beneficent gift. The canal is conducted through the centre of the principal street, and is bordered by trees, thus forming the wide street into two avenues a mile in length.

The trade of Delhi is still extensive, particularly in shawls, of which it is a great mart. They are brought from Cashmere in large quantities, some plain, to have borders sown upon them, and to be embroidered in gold and silk. The goldsmiths are much celebrated for the elegance and delicacy of the jewellery which they produce. The multitude of equipages seen in the principal streets is exceedingly great, and perhaps more diversified than those of any other city in the world.

The population of the city of Delhi has been estimated at 200,000, but no official returns have been published distinct from the administrative division in which it is included.

The site of old Delhi, which itself succeeded the Hindoo city of Indraput, is S.W. from the present city. It seems to cover a surface as large as London, Westminster, and Southwark, and presents a succession of ruins, fragments of brickwork, freestone, granite, and marble, scattered about, and extending as far as the eye can reach. Conspicuous among these ruins, and 6 miles S.W. from the city, is Humaïoon's tomb, a noble building of granite, on a platform 20 feet high and 200 feet square, above which rises the tomb, with a great dome of white marble in its centre. The architecture is very chaste and simple; and the whole is surrounded with a large garden, with terraces and fountains, all in a state of decay and ruin. Another remarkable ruin is the Cuttab Minar, a tower 242 feet in height, which Bishop Heber says is the finest tower he had ever seen. It has been repaired by the British authorities. There is also a gigantic astronomical observatory, with a dial, still in repair, of which the gnomon is 60 feet high.

Delhi is distant from Calcutta, by the Birbhoom road, 956 miles; from Bombay, by Ahmedabad and Ajmeer, 880 miles; from Madras, by Ellichpoor, 1275 miles; from Agra, 117 miles; from Lahore, 386 miles; and from Oude, 364 miles—all travelling distances.

(Bernier's *Travels in the Mogul Empire*, Eng. translation, Lond. 1826; Heber's *Journey to the Upper Provinces of India in* 1824–25; Emma Roberts's *Scenes and Sketches of Hindustan.*)

DELILLE, JACQUES, was born at Auvergne in 1738, and educated at Paris at the Collège de Lisieux. He afterwards became subordinate professor of Latin in the College of Amiens, and subsequently in Paris at the Collège de la Marche. He attained some celebrity as a poet by an epistle to M. Laurent; but his translation of Virgil's Georgics raised him to a proud distinction. It was received with enthusiasm, and in 1774 the author was elected a member of the Académie. He soon after published his celebrated poem 'Les Jardins,' the success of which does not seem to have been equal to that of the Georgics.

Delille accompanied M. de Choiseul Gouffier on his embassy to Constantinople, where he composed his poem 'L'Imagination.' On his return to Paris he became professor of belles-lettres at the university, and of Latin poetry at the Collège de France. He was unfortunate enough to lose all his property by the Revolution. At the celebration of the Fête de l'Etre Suprême, Robespierre demanded of Delille an ode for the occasion, and he produced a dithyrambic poem on the immortality of the soul. The troubles of the capital induced him, in 1794, to leave Paris for St. Diez, and subsequently to retire to Switzerland. Here he finished his 'Homme des Champs,' 'Les Trois Règnes de la Nature,' and 'La Conversation.' He afterwards visited London, where he translated Milton's 'Paradise Lost.' In 1801 he returned to Paris, and died in 1813.

DELIQUESCENCE, the change of form which certain bodies undergo from solid to fluid by exposure to the air, and absorbing moisture from it.

DELI'RIUM TREMENS, a disease of the nervous system, to which persons addicted to alcoholic drinks, though not exclusively, are peculiarly liable. As its name indicates, its principal symptoms are delirium and trembling. The delirium is a constant symptom; but the tremor is not always apparent, or does not exist. The delirium is always attended with sleeplessness: the patient is busy, and constantly talking, but is seldom angry or violent. His mind wanders from the objects around him, and he is apparently surrounded by the scenes of his imagination. His thoughts are mostly distressful and anxious. He fancies that persons are persecuting him, that reptiles or animals are running after him; he looks suspiciously behind the curtains or door, or under the pillow, and wants to wander about. He seldom meditates harm either to himself or others. When there is tremor, the hands are fidgety, and the patient constantly wants to use them. In addition to these symptoms are others less observed: the tongue is moist and creamy; the pulse, though frequent, is soft; the skin is perspiring, and emits a peculiar odour.

When the symptoms of this disease are obvious, its treatment is simple. The patient must have a sufficient quantity of opium administered to him to procure sleep; it should first be commenced in small doses, and then gradually increased, and continued. When opium does not produce the desired effect, it is sometimes necessary to give the patient a portion of his usual alcoholic beverage in order to prevent exhaustion. This must be discontinued however as soon as the patient's strength is sufficiently restored to do without it.

DELISLE, GUILLAUME, a French geographer of great celebrity in his own day, was born at Paris in 1675. In 1699 he published a map of the world, which, with other maps and dissertations on geography, led to his election as a member of the Academy of Sciences in 1702; and a little afterwards he was appointed geo-

grapher to the king, with a pension. Peter the Great paid him a personal visit at Paris, to attempt to induce him to go to Russia. He declined the invitation, but he gave Peter an excellent series of maps of his immense dominions. Delisle died of apoplexy in 1726, aged 51.

DELISLE, JOSEPH NICOLAS, a younger brother of the preceding, was born in 1688. His published labours commenced with an excellent observation of the great total eclipse of the sun in 1706, when he was only eighteen years of age; and in 1714 he was admitted a member of the Academy, in the section of astronomy. In 1724 he visited England, and, at the recommendation of Newton and Halley, he was elected a fellow of the Royal Society, on the foreign list. In 1726 he was appointed astronomer to the Czar Peter, a situation which he retained twenty-one years, when he returned to Paris on account of his health. He was then appointed professor of astronomy in the Royal College of France, which he held many years. Amongst his pupils were Lalande and Messier.

He died in 1768, at the age of eighty, having published, besides his 'History of Astronomy' (2 vols. 4to., 1738), no less than forty-four papers in the 'Memoirs of the Academy,' and several other dissertations elsewhere.

DELORME, PHILIBERT, was born in 1518, at Lyon, where his father was a builder in extensive practice. In 1533 he was sent to Rome, where, though he did not study very diligently, he was favoured by accident in making what was then considered an important discovery, namely, that of the mode practised by the ancients for tracing the Ionic volute, as described on a capital in Santa Maria Transtevere.

On his return to his native city in 1536, Delorme was employed to erect the portal of the church of St. Nizier, which, as far as it was ever finished, gives no very favourable idea of his architectural talent. He was soon afterwards summoned to Paris by Catherine de Médicis, with whom he ingratiated himself, became a great favourite, was patronised in his profession, made aumônier du roi, and had several church benefices conferred on him.

Delorme was associated with Primaticcio in the erection of the monument of Francis I., and that of the Valois princes at St. Denys (taken down 1791). Among works of a more strictly architectural character, he built the Château de Meudon for the Cardinal de Lorraine, and completed the Château de Madrid in the Bois de Boulogne at Paris. To these may be added, the Court at Fontainebleau, the royal seats of Villers-Cotterets, de la Muette, and St. Germaine-en-Laye, and the Château d'Anet, built for Diane de Poitiers, Duchesse de Valentinois. None of these buildings, or any other of his erection, show any originality of design, or indeed merit of any kind, notwithstanding his reputation during his life. The Tuileries, in which he was engaged with Bullant in 1564, is one of the most important; but, according to Callet, Bullant was the author of the general design. Delorme himself in the dedication of his works to Catherine (1567), only claims the 'Ionic order,' and some minor parts. The Tuileries of Catherine de Médicis now hardly exists except in name, and the portion attributed to Delorme (the centre pavilion of the façade) has undergone such changes that it can no longer be recognised as the original. Delorme died in Paris, May 30, 1577, at the age of 59.

DELOS, an island of the Grecian Archipelago, one of the group called Cyclades, lies in the strait between Mycone and Rhenea. According to poetic tradition, it was originally a floating island. It had several ancient names, as Ortygia, Cynthia, and Asteria. It was a seat of the worship of Apollo, who was said to have been born there. His temple and that of his mother, Latona, were in the town, which was built on a little plain on the west side of the island, at the foot of the lofty mountain Cynthus. Delos fell into the power of the Athenians in the time of Peisistratus. The Athenians instituted at Delos a festival, which returned at the beginning of every fifth year, called the Delia, and sent thither annually a sacred vessel, called the Theoris, in commemoration of the delivery of Athens by Theseus from the Cretan tribute. It was probably on account of the respect which all parties paid to this temple that the Athenians selected it as the depository of the tribute which they collected from their allies after the Persian War. (Thucyd., i. 96.) In 422 B.C. the Athenians removed the whole population of Delos to Adramyttium. (Thucyd., viii. 108.) When Corinth was destroyed by Mummius, Delos succeeded to the commerce of that city, and was for a time very flourishing. In the days of their prosperity the Delians carried on a very extensive slave-trade with Cilicia, and Delos became a great market for slaves. The modern names of this little island are Delo, Deli, Dili, and Sdilli. It is little more than a mass of bare rock.

DELPHI, now called *Castri*, the name of a people and a town of Phocis, celebrated for the oracle of Apollo. Its original name was Pytho. The oracles were delivered by a priestess, who sat upon a tripod placed over the mouth of a cavern, and who, having inhaled the vapour, pronounced some prophecy or gave some answer to those who consulted the oracle, in verse or prose. The great reputation of the Delphian oracle made it the richest shrine in Greece, as every person who was satisfied with the response he obtained made an offering of some costly donation to the temple. The first stone temple at Delphi was built by Trophonius and Agamedes: this having been destroyed by fire B.C. 548, a new one was built by the Amphictyons from the proceeds of a voluntary subscription, to which even Amasis, the king of Egypt, largely contributed. The wealth of Delphi attracted plunderers. The Persians under Xerxes made an unsuccessful attempt to get possession of the treasures accumulated there. (Herod., viii. 37.) The Phocian leaders in the Sacred War did not hesitate to appropriate them as a fund for the payment of their mercenaries; and Brennus, the Gallic king, subsequently carried off the greater part of the offerings which remained. [BRENNUS.] There were however still some objects for the rapacity of Nero,

who carried off 500 bronze statues at once. The city of Delphi, which was the largest in Phocis, was situated on an elevation, sixteen stadia in circumference, at the foot of the south side of Parnassus. Delphi was, from very early times, the meeting-place of the Amphictyons. [AMPHICTYONS.]

DELPHIA, a vegetable alkali, which exists combined with malic acid, forming malate of delphia in the seeds of the *Delphinium staphisagria*, or Stavesacre. It is a crystalline powder nearly insoluble in water.

DELPHI'NIUM, an extensive genus of the ranunculaceous order, consisting of annual or perennial herbaceous plants.

The species abound in the temperate parts of the northern hemisphere, and are often cultivated in gardens under the name of *Larkspurs*. Among the most showy kinds are—*Delphinium consolida*, a hardy annual, of which many varieties are known as Rocket Larkspurs; *D. Barlowii*, a magnificent double-flowered perennial hybrid; and the Bee Larkspurs, consisting of *D. grandiflorum*, *Sibiricum*, *Chinense*, *mesoleucum*, and many more. The Bee Larkspurs derive their name from a striking resemblance of the petals to the black body of a humble bee covered with yellow hairs, the head and legs of the insect being supposed to be immersed in the cup of the flower.

The only species that has been applied to any useful purpose is Stavesacre, *D. staphisagria*, an annual inhabiting the warmer countries of the south of Europe. Stavesacre seeds are not now used internally: when introduced into the stomach, they cause vomiting, purging, and local ulceration of the intestines, and they may even produce serious general effects. Stavesacre has been used externally in powder for the destruction of lice, and for the cure of scabies, but its application to abraded surfaces is not without danger.

DELPHINUS. [WHALES.]

DELPHI'NUS (the Dolphin), one of the old Greek constellations, referred to the fable of Amphitrite and to that of Arion. It succeeds Aquila in the heavens, and its principal cluster comes on the meridian about three quarters of an hour later than the principal star (*a*) of the latter, and nearly in the same declination.

DELTA, the name of the fourth letter of the Greek alphabet. The term was geographically applied by the Greeks to that part of Lower Egypt which, being comprised between the two main branches of the Nile and the sea, had a triangular form, somewhat resembling the Greek letter Δ. The same name has since been extended to those tracts formed by alluvial deposits at the mouths of great rivers which, like the Nile, empty themselves into the sea by two or more diverging branches, though the spaces circumscribed by these branches and the sea-line have, in many cases, very little of the triangular form.

Deltas are formed not only at the mouths of rivers that enter the sea, but sometimes at the confluence of tributary streams with their recipients, as is seen in many rivers of America; such as the Rio Branco and the Rio Jupura, which respectively enter by a great number of branches into the Rio Negro and the Marañon, or Amazons. Rivers entering lakes also, in some instances, form deltas at their mouths. In many instances of rivers that enter lakes or tideless seas, the alluvial tract formed by the deposit of the detritus carried down by the main stream is intersected by a great number of minor streams or branches dividing the whole into islands, which are hence termed *deltoid islands*. The principal deltas in Europe are—those of the Rhone, the Danube, and the Po; the delta of the Rhine has been, as it were, obliterated by the irruption of the Zuydersee; the Wolga, before entering the Caspian, is split into innumerable branches; but the space which they inclose bears little resemblance to a delta: in Asia are those of the Ganges, the Indus, the Irrawaddy, the Cavery, the Euphrates, the Oural, the Lena, and the Kolima: in Africa, those of the Nile and the Niger: and in America, those of the Mississippi and the Orinoco.

DELU'C, JEAN ANDRE', was born at Geneva in 1727. In early life he took an active part in the political affairs of his native republic; but soon after his return from Paris, in 1770, whither he had been sent on a mission to the Duc de Choiseul, prime minister of France, he left Geneva and its politics for England, to devote himself entirely to scientific pursuits, and principally to geology. In 1778 he produced his first work, 'Lettres Physiques et Morales sur l'Histoire de la Terre et de l'Homme,' 8vo. These letters were addressed to Queen Charlotte, consort of George III., who appointed Deluc her reader: they relate only to the Alps of Switzerland; but in the following year appeared a continuation of the work, under the same title, including Deluc's travels through Rhenish Germany, Hanover, Friesland, Holland, Belgium, &c., in 5 thick vols. 8vo. These letters are not merely scientific treatises; they are also descriptive of scenery, of the inhabitants, and their manners; they contain statistical and moral observations, and many of them are full of interest even to the general reader. He continued to publish up to 1804. His works are numerous, and a list of them may be be found in Watt's 'Bibliotheca Brit.' His 'Recherches sur les Modifications de l'Atmosphère, contenant l'Histoire critique du Baromètre et du Thermomètre, un Traité sur la Construction de ces Instrumens,' &c., 2 vols. 4to., Geneva, 1772, is perhaps the one in which Deluc rendered the most positive service to science. He also made great improvements in the barometer, especially as applied to the measurement of heights. He was appointed in 1798 professor of philosophy and geology in the University of Göttingen. He passed several years in Germany, at Berlin, Hanover, Brunswick, &c. After the battle of Jena he returned to England, and died at Windsor, November, 1817, in his 91st year.

DELVINO. [ALBANIA.]

DE'MADES, an Athenian orator, contemporary with Demosthenes. He took the part of Philip in the Olynthian affair, and was liberally rewarded by that prince, who received him well when he fell into his hands after the battle of Chæronea. He was mainly instrumental in bringing about the peace between Philip and Athens, which followed

that victory. In 318 B.C. he went on an embassy to Antipater to induce him to remove the garrison from Munychia, and took his son Demeas with him. Unfortunately, a letter which he had written to Perdiccas fell into the hands of Cassander, who, in revenge for the offensive terms in which Antipater was alluded to in it, put to death the orator and his son. Cicero and Quintilian assert that he did not write any thing; but a fragment of his speech in defence of his twelve years' administration is extant. He was a great wit, and many of his sallies are recorded.

DEMAND AND SUPPLY are terms used in Political Economy to express the relations between consumption and production—between the demand of purchasers and the supply of commodities by those who have them to sell. The relations between the demand for an article and its supply determine its price or exchangeable value: the relations between the demand for labour and its supply determine the amount of wages to be earned by the labourer. [WAGES.] The price of an article will rarely vary, for any length of time, very much above or below its cost of production, which cost means in fact the price below which no man would continue to sell his goods. An ordinary profit is a part of the cost of production, in an enlarged sense, as much as the expense of wages and materials. Nor will the wages of labour, for any length of time, much exceed or fall below the amount necessary to maintain labourers and their families in such comforts as their habits of life have accustomed them to believe necessary for their subsistence. But bearing in mind that, in the prices of commodities and labour, there is a certain point, determined by causes independent of demand or supply, above or below which prices cannot materially vary for any considerable time, all variations of price, if the medium in which they are calculated remains unchanged, may be referred to the proportion which exists between the demand for commodities and the supply of them—between the quantities which purchasers are willing and able to buy, and the quantities which producers are able and willing to sell.

To have any influence upon prices, a demand must be accompanied by the means of purchasing. An 'effective demand,' as it is termed by Adam Smith, exists wherever one man is anxious to exchange the products of his own labour for that of other men. The universal desire of mankind to possess articles of comfort and luxury is natural to man; men will always gratify it whenever they have the means, and these means consist in the products of their own labour. Hence all that is required to convert this desire of acquisition into an effective demand is ample employment for industry. Increase the production of all commodities, and an increased consumption of them is the certain result; for men, having larger products of their own labour to offer in exchange for the products of other men's labour, are enabled to purchase what they are always eager to acquire. Production, therefore, is the great object to be secured, not only as furnishing a supply of commodities necessary and useful to mankind, but also as creating an effective demand for them.

When trade is depressed by a languid demand, it is commonly said that increased consumption is all that is required to restore its prosperity. But how is this consumption to be caused? The desire to consume is invariable, and thus any falling off in consumption must be attributed to a diminished production in some departments of industry, which causes an inability to consume. When production is restored, an effective demand for all articles will immediately follow; but until the productive energies of the consumers are in a state of activity it is in vain to expect from them an increased demand.

A country is in the highest prosperity when there is an active and steady demand for commodities and labour, and a sufficient supply of them. Any disturbance of the proportion between one and the other is injurious to the community; and the injury is greater or less according to the extent and duration of such disturbance. When the proportion is well adjusted, the whole community derive benefit from the circumstance, both as producers and consumers; when it is disturbed, they are injured in both capacities.

Demand and supply become adjusted in various ways through the medium of price, whenever the one exceeds the other. This is the result of natural laws, the operation of which is of the highest value to mankind. If the supply be incapable of increase, it economises consumption; if the supply can be increased, it encourages production. In either case it is of great benefit to the consumer. Let us take the example of a bad harvest in a country excluded from all foreign supply. Suppose that prices did not rise, but remained precisely the same as if the harvest had been abundant, what would be the consequence? The whole population would consume as much bread as usual, and use flour in every way that luxury points out, unconscious of any scarcity. By reason of this improvidence the whole of the corn would be consumed before the next harvest, and the horrors of famine would burst, without any warning, upon a people living as if they were in the midst of plenty. This evil is prevented by a rise of prices, which is a symptom of scarcity, just as pain is a symptom of disease. By timely precaution the danger is averted. A high price renders economy and providence compulsory, and thus limits consumption. The supply therefore, instead of being exhausted before the next harvest, is spread over the whole year. In the case of food, it is true that such economy is painful, and presses heavily upon the poor; but this evil is a mercy compared with famine. If no privation had been endured before scarcity became alarming, none but rich men could buy a loaf; for every one who had a loaf to sell would be risking his own life if he sold it.

Whenever there is an excessive production of any commodity, it is an evil almost as great as scarcity. It is true that the consumer derives benefit from it, but the producing classes are most injuriously affected. In order to raise the value of the produce of their labour, they must cease to produce, or must produce in less quantities. The workmen are thus either deprived of employment

altogether for a time, or are employed for a portion of their time only, at reduced wages; while their employers are disposing of their goods at low prices, which scarcely repay the outlay of their capital. Nor does the penalty of over-production fall exclusively upon those engaged in the trade in which supply has exceeded the demand. Their distresses extend to other classes. It has been shown that it is to production we must look as the cause of sustained consumption, and thus the pressure upon any considerable branch of productive industry must be sensibly felt by those who have the produce of their own labour to sell. Production has failed, and consumption must therefore be diminished.

The supply of markets is a very speculative business, and is often conducted with more zeal than discretion. When a particular trade is supposed to be more prosperous than others, capitalists rush into it in order to secure high profits; and in this country the abundance of capital, the perfection of our machinery, and the skill of our workmen enable them to produce with extraordinary facility. Over-production in that particular trade is the consequence, and all engaged in it suffer from the depreciation in the value of their goods; but if, instead of rushing into the favourite trade, they had distributed their enterprises more widely, their own interest and that of the community would have been promoted. In proportion to the extent of the market, and the variety and abundance of commodities to be exchanged, will be the facility of disposing of the products of capital and labour; and this consideration points out a universal freedom of commerce as the most probable antidote to gluts.

(Adam Smith, *Wealth of Nations*, book i.; M'Culloch, *Principles of Political Economy*, part i., ch. 7, and part ii., ch. 1, 2; Malthus, *Principles of Political Economy;* Ricardo, ch. 30; Mill, *Essays on Unsettled Questions of Political Economy*, Essay ii.)

DEMESNE. [MANOR.]

DEME'TER is the name of a goddess whom the Romans call *Ceres*. The word Demeter seems to mean 'mother earth.'

Demeter is represented on ancient monuments with a basket on her head, with some ears of corn in her hand, and as seated in a chariot drawn by lions, panthers, or elephants.

DEME'TRIUS PHALE'REUS, an Athenian, the son of Phanostratus, and a scholar of Theophrastus. He began to take a part in public affairs about 320 B.C. He was condemned to death at the same time with Phocion (317 B.C.) for espousing the Macedonian party, but he escaped, and was shortly after made governor of Athens by Cassander. He maintained his authority for ten years, and his administration was popular. When Demetrius Poliorcétes came to Athens (307 B.C.) and proclaimed the old democracy, he was obliged to fly a second time. After the death of Cassander (296 B.C.) Demetrius retired to the court of Ptolemæus Soter, king of Egypt, where he was well received, and where he probably wrote most of the numerous works attributed to him. He was banished by Philadelphus, the son of Soter, and died soon after. A Treatise on Rhetoric, ascribed to him, has come down to us, and has been edited by Schneider, Altenburg, 1779.

DEMETRIUS POLIORCE'TES (the City-Taker) was the son of Antigonus the Great. He appears to have been born about B.C. 334. In the division of Alexander's empire, it was determined that Greece should be freed from the dominion of Cassander, and this duty Demetrius took upon himself. Demetrius Phaléreus then governed Athens as Cassander's deputy; but when Demetrius took Munychia, and offered a democratical form of government to the Athenians (307 B.C.), Demetrius Phalereus was glad to owe a safe retreat to Thebes to the generosity of his namesake. In the following year Demetrius gained a naval victory over Ptolemæus, and took Cyprus, in consequence of which his father assumed the title of king. In 304 Demetrius laid siege to Rhodes; but, after a year's unsuccessful operations, he formed an alliance with the Rhodians against all persons. Demetrius then returned to Greece, forced Cassander to raise the siege of Athens, and pursued him to Thermópylæ: after this he took Sicyon by surprise, and then Corinth and Argos, where he married Deidamia, sister of Pyrrhus, king of Epirus. Cassander was willing to make peace, but Antigonus showed so little moderation, that the other successors of Alexander were induced to form a coalition against him. Antigonus met his enemies at Ipsus, in Phrygia, and fell in the battle. Demetrius escaped from the defeat with 9000 men to Ephesus, whence he passed over to the Thracian Chersonese. While he was there engaged in laying waste the lands of Lysimachus, Seleucus sent to him to demand his daughter Stratonice in marriage, to which he readily agreed. In 299 B.C. he laid siege to Athens, which soon surrendered, and was treated with great kindness. The quarrel of Alexander and Antipater, the two sons of Cassander, gave him an opportunity of getting possession of Macedon, after having put to death Alexander, who had called him in to assist him against his brother (B.C. 294). Demetrius was driven from the throne of Macedon by Pyrrhus the Epirote, in 287 B.C. Shortly afterwards he fell into the hands of Seleucus, whose kingdom he had invaded, and was detained by him in honourable confinement till his death in 283 B.C. This celebrated man was so eminently handsome that sculptors and painters always fell short of his beauty. He is said to have shortened his life by his excesses.

Coin of Demetrius Poliorcetes. British Museum. Actual Size. *Silver*

Reverse.

DEME'TRIUS SOTER, king of Syria, the son of Seleucus Philópator, passed his youth at Romè as a hostage. He effected his escape, partly through the assistance afforded him by the historian Polybius, and mounted the throne of his ancestors about 161 B.C. He contended in vain with the Maccabees, who then ruled over Judæa, and died valiantly fighting against Alexander Balas about B.C. 150.

Coin of Demetrius Soter. British Museum. Actual Size. Silver.

Reverse.

DEME'TRIUS NICA'TOR was the son of Soter. Having been sent to Cnidos, towards the end of his father's reign, he did not fall into the hands of the successful usurper Balas, and with the assistance of the king of Egypt, whose daughter Cleopatra he had married, he soon possessed himself of his father's throne. He was for some time a prisoner in the hands of the Parthians, on whom he had made war. While in captivity, he married a daughter of Mithridates, the Parthian king; and his wife Cleopatra formed a union with his brother Antiochus, who became king of Syria in his absence, and fell in battle with the Parthians. Demetrius regained his kingdom after the death of Antiochus. But he was again expelled by another usurper, and was assassinated by the orders of his wife Cleopatra in a temple at Tyre, where he had taken refuge, B.C. 126.

Coin of Demetrius Nicator. British Museum. Actual Size. Silver.

Reverse.

DEMISE, from the Latin *demissio*, is commonly used to express an estate for years. The word *demisi*, 'I have demised,' is a term that is or may be used in the grant of a lease for years. The word demise may also signify an estate granted in fee or for term of life; but the most common signification is that which has been stated.

The term demise, as applied to the crown of England, signifies the transmission (demissio) of the crown and dignity by the death of a king to his successor.

DEMISEMIQUAVER. [NOTE.]

DEMOCRACY (δημοκρατία), a word taken from the Greek language, like aristocracy, oligarchy, monarchy, and other political terms.

The third book of Herodotus (chap. 80–82) contains what we may consider to be the views of the oldest extant Greek historian on the merits and defects of the three respective forms of government, as they are called, democracy, oligarchy, and monarchy.

In forming a notion of a democracy, as conceived by the Greeks, we must consider a small community, such as a single town with a little territory, and we must view such a community as an independent sovereignty. The institutions which in modern times have approached most nearly to a pure democracy are some of the Swiss cantons. To conceive correctly a Greek democracy and some of the democracies of the North American Union, it must also be remembered that the whole community in such states consisted and consists of two great divisions, freemen and slaves, of whom the slaves form no part of the political system.

In most Greek communities there were two marked divisions of the freemen: the 'few,' or 'rich;' and the 'many,' or 'not rich' (ἄποροι); between whom a fierce contest for political su-

periority was maintained. This contest would often end in the expulsion of the 'few,' and the division of their lands and property among the 'many;' sometimes in the expulsion of the leaders of the 'many,' and the political subjugation of the rest. Thus the same state would at one time be called a democracy, at another an oligarchy, according as the one or the other party possessed the political superiority.

Aristotle ('Polit.,' iv. 4) defines a democracy to be, when the freemen, and those not the rich, being the majority, possess the sovereign power; and an oligarchy, when the rich and those of noble birth, being few, are in possession of the sovereign power. This definition of an oligarchy implies that the majority are excluded from participating in the sovereign power. In another passage (iv. 4), where he is speaking of the different kinds of democracy, he speaks of the first kind as characterised by *equality;* and by this equality he understands when the fundamental law of such a democracy declares that 'the not rich have no more political power than the rich, neither body being supreme, but both equal, and all participating equally in political power.' Such in fact approaches very near the exact notion of a pure democracy, or at least a democracy as pure as we have any example of; for all women, persons of unsound mind, males not adult, and slaves, are excluded from political power even in democracies.

A pure democracy is where every male citizen, with the exceptions above mentioned, forms an equal and integral part of the sovereign body; or, as Aristotle expresses it, where he is speaking of a democracy in which the people are supreme, and not the law, the democracy is 'monarch, one compounded of many; for the many are supreme, not as individuals, but all collectively.' This is the fundamental notion of a democracy; every other institution incident to or existing in a democracy is either a necessary consequence from this notion or a positive law enacted by the universal sovereign.

It is necessary, in order that a democracy should exist, and continue to exist, that the whole body should recognise the principle that the will of the majority must bind the minority. There must, therefore, be some means of ascertaining the will of every individual who is a member of the sovereign body, and there must be no interference with the free expression of his will, so far as such interference can be prevented. Whenever the persons who compose a democracy give their opinion on any subject, they express it by what is called a vote, which is recorded, and the majority of the votes is the will of the democracy. The vote may be given either openly by word of mouth or in writing; or it may be given secretly, which is called vote by ballot, and the vote by ballot is considered by many political writers essential to secure the voter from all interference with the free expression of his opinion. Every freeman, being an equal part of the sovereign, has no responsibility in the proper sense of that term, such as some persons dream of: the many who compose the sovereign are no more responsible than when the sovereign is one; and the notion that the vote of those who possess sovereign power should be open and notorious, on the ground of their being responsible, is inconsistent with the notion of their possessing sovereign power. The only way in which the universal sovereign can be so made responsible to a positive morality (for there is nothing else that such sovereign can be made responsible to) must be by the universal sovereign making such open voting a constitutional rule, which rule the same body that made may repeal when it pleases. But, if such rule is inconsistent with the free exercise by each individual of his share of sovereignty, it would be an act of suicide in the body politic.

If the democracy consider a constitution [CONSTITUTION] to be useful for carrying into effect the will of the sovereign, such constitution, when made by the express will of the majority, whatever may be the terms of such constitution, does not affect the principle of the democracy. Such constitution can be altered or destroyed by the same power that made it; and alterations of the constitution have often been made in the states which form the North American Confederation. If a representative body is necessary for effecting the purposes of the sovereign, such body may be elected and invested with any powers by the sovereign body, always provided that the representative body is responsible to the sovereign, whose creature it is.

DEMO'CRITUS was probably born at Abdéra in Thrace, in 460 B.C. He received his first lessons in astrology and theology from some Magi, who had been left with his father by Xerxes when passing through Abdera to the invasion of Greece. Democritus is said to have visited Egypt, that he might learn geometry from the Egyptian priests, and to have gone even to India. He sojourned for some time at Athens, but from contempt of notoriety, as it is said, was known to nobody in that city. Democritus is said to have continued travelling till he was eighty years old. He died in the year 357 B.C. at the age of 104. Democritus loved solitude, and was wholly wrapped up in contemplation.

Democritus followed Leucippus, whose hearer he is said to have been, and he preceded Epicurus by somewhat less than a century, as an expounder of the atomic philosophy. He viewed all matter as reducible to particles, which are themselves indivisible (hence called *atoms*), and which are similar in form. He recognised only matter and empty space as composing the universe, and viewed mind as consisting of round atoms of fire. (Aristot., 'De Anim.,' 1, 2.) Arguing that nothing could arise out of nothing, and also that nothing could utterly perish and become nothing, he contended for the eternity of the universe, and thus, as some suppose, dispensed with a creator. He further explained the difference in material substances (mind, as has been said, being one of them) by a difference in the nature and arrangement of their component atoms, and all material (including mental) phenomena by different motions, progressive or regressive, straight or circular, taking place among these atoms, and taking place of necessity.

In psychology, he explained sensation, as did Epicurus after him, by supposing particles or sensible images to issue from bodies. In moral philosophy, he announced nothing more than that a cheerful state of mind was the one thing to be sought after.

A list of the very numerous writings of Democritus is contained in Diogenes Laertius (ix. 46-49).

For an account of the philosophy of Democritus the reader is referred to Cudworth's *Intellectual System*, chap. i.; and to Ritter, *Geschichte der Philosophie*, vol. i.

DEMOIVRE, ABRAHAM, was born at Vitry in Champagne, on the 26th of May, 1667, and was descended of an ancient and honourable family of the French Protestant church. The Revocation of the Edict of Nantes in 1685 compelled him to leave his native country, and, like a great number of the refugees created by that revocation, he settled in England, choosing for the field of his efforts the metropolis.

He appears at the earliest period to which any account of him reaches to have devoted himself to teaching mathematics. He also, though he was not the first who adopted that plan, read lectures on natural philosophy; but it does not appear that his attempts in this way were very successful, he being neither fluent in the use of the English language, nor a good experimental manipulator.

Demoivre met with the 'Principia' by accidentally calling on a nobleman at the time when Newton came to present his work; and there is no doubt that he was one of the few who at that time were able to follow the illustrious Newton in the course of his investigations. His writings on analysis abound with consummate contrivance and skill; and one at least of his investigations has had the effect of completely changing the whole character of trigonometrical science in its higher departments.

At a comparatively early period of his residence in London, he was admitted to the society of Newton and his immediate circle of personal friends; and many instances of the regard with which he was treated are current among the traditions which have reached our own time. This of course led to an intimacy with the leading mathematicians of that period; and his great talents soon obtained his election into the Royal Society of London, as well as, ultimately, into those of Paris and Berlin.

Demoivre lived to the advanced age of more than eighty-seven; but, as he outlived most of his early associates and friends, his circumstances became greatly reduced. He is said to have sunk into a state of almost total lethargy, the attacks of which often lasted for several days; and his subsistence was latterly dependent on the solution of questions relative to games of chance and matters connected with the value of life-annuities, which he was in the habit of giving at a tavern or coffee-house in St. Martin's Lane, London. He died on the 27th of November, 1754. His separate publications are the following:—

1. 'Miscellanea Analytica, de Seriebus et Quadraturis,' 1730, 4to. When complete, it has a 'Supplement.' Last and best edition, 1756.

2. 'The Doctrine of Chances, or the Method of Calculating the Probabilities of Events at Play.'

3. 'Annuities on Lives,' 8vo., 1724.

DEMOIVRE'S HYPOTHESIS is an hypothesis on the duration of human life, formed by Demoivre, as he informs us in the preface of his Treatise on Annuities, some years after the publication of the first edition of his Treatise on Chances, on the inspection of Halley's Breslau Tables. Observing that the decrements of life at the middle ages were very nearly uniform, Demoivre made an extension of this law to the whole of life, not thereby intending to assert that any such principle was correct for childhood and old age, but simply that the effect of the error upon the value of annuities at the middle ages of life would be trivial. The hypothesis is as follows:—*Of eighty-six persons born, one dies every year, till all are extinct.* The remainder of eighty-six years, at every age, Demoivre called the *complement of life.* The half of the complement of life is the average duration (commonly called the expectation); and the peculiarity of Demoivre's Hypothesis is, that, according to it, every person has an even chance of living the average time of people of his age, which is not true of other Tables. The Northampton Tables certainly do nearly coincide with this law at the middle periods of life, but the Carlisle and most other Tables differ materially from it.

DE'MONA, VAL DI, one of the three old divisions of Sicily, which comprised the north-east part of the island, now forms the two intendenze, or provinces, of Catania and Mossina, and a part of the intendenza of Palermo. A great part of it is occupied by Mount Ætna. [ÆTNA; SICILY.]

DEMONSTRATION. This word formerly meant any manner of *showing*, either the connection of a conclusion with its premises, or that of a phenomenon with the asserted cause. Thus we find it asserted by an early writer that the system of Copernicus, *though false*, gave *truer demonstrations* of the celestial motions than any other; meaning that those motions could be more easily shown to be a necessary consequence of the hypothesis cited than of any other. It is very important, in reading the old English writers, to remember this use of the term.

Demonstration now means only that process by which a result is shown to be a necessary consequence of the premises from which it is asserted to follow, on the supposition that those premises are admitted, either as a matter of fact, or of intuitive evidence, or of previous demonstration.

But in common life the word demonstration means any sort of reasoning which the party using the term chooses to call proof. 'I consider it as demonstrated' means the same thing as, 'evidence has been offered which makes it so probable to me that I am willing to act upon that evidence.'

DEMONSTRATIONS, in military affairs, are operations of any kind which may be performed for the purpose of gaining an advantage over the enemy; but the term is employed chiefly when

the object is to deceive the enemy respecting the measures which it is intended to employ against him.

False demonstrations consist in displaying an apparent activity in forming or repairing a road, or in sending provisions or stores to a particular place, as if preparatory to a march of troops in that direction; in marking out ground as if for an encampment; and in detaching bodies of troops to make feigned attacks. Such demonstrations are made chiefly with a view of inducing an enemy to divide his forces, and thus weaken his line at points against which the real movement or attack is intended to be directed.

DEMOS'THENES was born probably about B.C. 384. He was the son of Demosthenes, an Athenian citizen, who carried on the trades of cutler and cabinet-maker, and of Cleobúle, the daughter of Gylon. Gylon, who had been governor of Nymphæum, an Athenian settlement in the Tauric Chersonesus, betrayed it to the Scythians, and, taking refuge with their chief, married a Scythian woman, who was the maternal grandmother of Demosthenes. Thus the great Grecian orator was partly of barbarian descent.

Demosthenes died when his son was seven years old, leaving him and a sister, younger than himself, to the care of A'phobus and two other guardians, who were unfaithful to their trust, and appropriated to their own use or mismanaged the property. Demosthenes however admits that he received a good education.

Having heard Callistratus speak, he was fired with ambition to become an orator himself, and he accordingly received instruction in the rhetorical art from Isæus. It was suspected that the speeches against his guardians were written, or at least corrected, by Isæus, partly because Demosthenes was so young when they were delivered, and partly because they bore marks of the style of Isæus. He is said to have taken lessons in action from Aristonicus, a player.

Demosthenes was naturally of a weak constitution: he had a feeble voice, an indistinct articulation, and a shortness of breath. Finding that these defects impaired the effect of his speeches, he set resolutely to work to overcome them. On the termination of his minority, he commenced a suit against his guardian about his property. Estimating his losses at 30 talents (inclusive of ten years' interest), he sued Aphobus for one-third part, and gained his cause, without however succeeding in obtaining more than a small part of his money. This took place B.C. 364, when he was in his 20th year; but the extant orations against his guardian are evidently not the work of a youth of that age. He subsequently adopted the profession of writing and delivering, as a hired advocate, speeches for persons engaged in private and public causes — a practice which was now generally adopted by the Greek orators, and was attended with considerable profit. His first speech on a public occasion was made in 355 B.C., in which year he wrote the speech against Androtion, and wrote and delivered that against Léptines.

Of his speeches relating to public concerns, there are three which have a direct bearing on his personal history: the speech against Midias, that concerning Malversation in the Embassy, and that in behalf of Ctesiphon, or, as it is commonly called, the 'Oration on the Crown.' The two last are noticed under the article Æschines. [ÆSCHINES.]

The first speech on a public affair that remains, and probably the first which Demosthenes published, is that on the Symmoriæ, which was delivered B.C. 354, and in part relates to a question of finance, but more particularly to a scheme then on foot for sending Chares with an armament into Asia against the Persians. Against this measure Demosthenes directed his eloquence with success; and this may be considered the beginning of his struggle with Philip, for the Macedonian cause would have gained by any loss which Athens might sustain. About a year after, Philip began to take an active part in the affairs of the Sacred War, as that in Phocis is usually called. He defeated the Phocian alliance, and only retired, as it should seem, to avoid any rupture with Athens, such as might preclude all hope of adding her to the number of his auxiliaries. At this juncture Demosthenes, who had been opposed to the former war, joined Chares, and delivered his first Philippic.

The motive of this apparent change of opinion is evident: on the former occasion, he saw that war would have been the dispersion of strength which was needful for a nearer struggle; now, he saw that the time of that struggle was come, and he knew that, to be effectual, Athens must direct it. But Athens had lost much of that spirit of individual bravery which characterised her in the best times of her history. The exhortations of Demosthenes failed in producing the desired effect; nor was it till Philip had defeated Kersobleptes the Thracian, whom it was the interest of the Athenians to support as his rival, that they considered themselves compelled to commence military operations against him.

This was at last done by sending successive expeditions to Olynthus, a maritime town near the Isthmus of Palléne, and by an inroad into Eubœa, under the direction of Phocion, by means of which the Macedonian influence was lessened in that island. The former step was however the more important, as Olynthus was a place of strength, and was looked on with great jealousy by Philip, as being now the ally of Athens. In spite of the exertions of Demosthenes, Olynthus was taken by Philip in the spring of 347 B.C.

Early in B.C. 346, Demosthenes, with Æschines and eight or nine others, went on an embassy to Philip, to treat of peace. The motive which apparently urged Demosthenes to agree to a peace was that the means of resistance were too small to allow any hope that Athens alone could use them effectually. Be that as it may, Demosthenes never slackened his efforts, and in 343 B.C. we find him accusing Æschines of malversation in the former embassy, and acting as one in a second to counteract Philip's influence in Ambracia and Peloponnesus.

About this time too Demosthenes became in a more decided sense the leader of his party, in

the room of Chares, and for the next two years employed himself in supporting and strengthening the anti-Macedonian party in Greece. His principal measures were an embassy to the Persians; the strengthening of the alliance with Byzantium and Perinthus for the purpose of forming alliances; and the relinquishment by Athens of all claim on Eubœa, in which Phocion concurred.

The struggle now began. Philip laid siege to Perinthus, to Selymbria, and afterwards to Byzantium, and fitted out a fleet. At this juncture, Demosthenes delivered his fourth Philippic, in which, among other things, he recommended the restoration of the festival-money to its original use, alleging the scruples felt by some concerning its application to military purposes, and the increase in revenue which rendered that application no longer necessary. In 339 B.C. the siege of Byzantium and Perinthus was raised, and a short peace ensued; but in the succeeding spring Philip was chosen Amphictyonic general. The victory of Philip at Chæronea, in 338 B.C., made him the master of the destinies of Greece. Under these circumstances, the party of Phocion made some faint attempt at action; but Philip, with his usual remarkable policy, forestalled them by releasing his Athenian prisoners, and using his victory with the greatest moderation.

Demosthenes was among the fugitives from Chæronea, and does not again appear till the funeral ceremony of those who fell, when he pronounced the customary oration, and resumed his place at the head of the government. He became victual-provider for the city, superintended the repairs of the fortifications, and was proceeding with his usual vigour in prosecuting his political schemes, when news came that Philip had been assassinated, July, 336 B.C.

On the accession of Alexander, Demosthenes persevered in his decided opposition to Macedon, and, on the report of Alexander's death, he fanned the flame of insurrection against the power of Macedonia. After the destruction of Thebes, Alexander demanded the person of Demosthenes, with nine other Athenians, but Demades by some means contrived to save Demosthenes.

During Alexander's Persian expedition, Demosthenes had to sustain an attack from his old rival Æschines. He defended himself from the charges brought against him [ÆSCHINES] in the oration called that 'On the Crown.'

The only affair of moment in which Demosthenes was at this time engaged was occasioned by the treachery of Harpalus, one of Alexander's generals, who had fled to Europe on the return of Alexander. He came to Athens as a suppliant, and Demosthenes at last espoused his cause, not without suspicion of bribery. For this he was prosecuted and fined, and, not being able to pay the fine, he retired from Athens till the death of Alexander, B.C. 324.

During the Lamian War he presided at Athens, and when Antipater defeated the confederate Greeks, and marched upon the city, Demosthenes, as the prime mover of the confederacy, judged it prudent to withdraw to Calauria, a little island opposite Trœzen, where he took refuge in a temple of Poseidon. Macedonian messengers were sent to persuade him to accompany them to Antipater, but he resisted all their entreaties. Plutarch, from whom this account is taken, says that he retired into the inner part of the temple under pretence of writing a letter, and while there took poison, and died before he could get out of the temple.

Those who expect to find in the oratory of Demosthenes the fervid and impassioned language of a man carried away by his feelings, to the prejudice of his judgment, will be disappointed. He is said not to have been a ready speaker, and to have required preparation. All his orations bear the marks of an effort to convince the understanding rather than to work on the passions of his hearers. Most of the speeches of Demosthenes on political affairs, as we now possess them, are laboured compositions. Notwithstanding the easy flow of the language, the art and industry of the orator are visible in almost every line; and in nothing are they more apparent than in the admirable skill by which he makes almost every period produce its effect, and in the well-judged antithesis which gives such force and precision to his expression, that it seems as if no other words and no other order of words could be so appropriate as those which he has chosen. The style of many of the orations on civil matters which were delivered before the courts of justice is very different: there is an air of easy negligence about them, and an absence of that laboured accuracy which characterises his other compositions. But these orations are invaluable as specimens of what we now call stating a case, and well worth the attentive study of those who would make themselves acquainted with the social condition of Athens at that time.

The best edition of the text of Demosthenes is that by E. Bekker. There is a French translation of Demosthenes by Auger. Leland has translated into English all the orations which refer to Philip, with the oration of Æschines against Ctesiphon, and one by Dinarchus.

DEMOUSTIER, CHARLES ALBERT, was born at Villers-Cotterets in the year 1760. The work which chiefly brought him into notice was his 'Lettres à Emilie sur la Mythologie.' These letters are written in a pleasing style, and attained considerable popularity. His other works are chiefly theatrical; of these 'Le Conciliateur,' a comedy in verse, was one of the best and most successful. He died at the place of his birth in 1801.

DEMPSTER, THOMAS, was the son of Thomas Dempster, of Muiresk, in Aberdeenshire, where he was born, on the 23rd of August, 1579. His life is a series of strange adventures, where the literary triumphs of the wandering scholar are mingled with fierce controversy and occasional deeds of armed violence. Thomas Dempster commenced his classical studies at Pembroke Hall, Cambridge, at the age of ten, and completed his education at Paris, Louvain, and Rome. He took the degree of D.C.L., and was made regent in the college of Navarre, in the University of Paris, at a time when, according to his own ac-

count, he must have been only seventeen years old. At the beginning of the year 1616 he was in England, where he married Susanna Waller, a woman whose disposition appears to have been no less hardy and reckless than his own. Dempster was afterwards teacher of the belles-lettres in the University of Bologna, where he seems to have involved himself in a more than usual number of disputes, and his wife eloped with one of his students. After an ineffectual attempt to overtake the fugitives, he died at Butri, near Bologna, on the 6th of September, 1625, the victim apparently of overwrought energies and a broken spirit. Dempster's works are very numerous. Dr. Irving, in his 'Lives of Scottish Writers,' gives a list of fifty. His 'Antiquitatum Romanarum Corpus Absolutissimum,' an edition, or rather an enlargement of the work by Rosinus, bearing that title, published in 1613, is well known. There are many editions of it, and it forms, both in the substance and illustrations, the foundation of Kennet's and other popular books on Roman antiquities. His 'De Etruria Regali,' left in MS., was magnificently edited in 1723-4, in two volumes, folio, by Sir Thomas Coke. His 'Historia Ecclesiastica Gentis Scotorum' was published at Bologna in 1627, and was reprinted for the Bannatyne Club in 1829. It is simply a biographical dictionary of Scottish authors.

DEMULCENTS are medicinal agents which have the property of protecting sensible surfaces from the action of irritating matter, by hindering it from coming in direct contact with them. When much water is present in any demulcent liquid, the action is partly that of a diluent, but the chief benefit results from the bland nature of the substance, or from its viscidity. Demulcents are either solutions, such as mucilage of gum arabic, or certain substances mechanically diffused through water or milk, such as wax, spermaceti, or suet. Their beneficial effects are greatest over the mucous surfaces with which they come into immediate contact, such as the throat, stomach, and intestinal canal, but by sympathy their soothing action would appear to be extended to the mucous surfaces of the lungs, and of the urino-genital organs.

DEMURRAGE, the term used to denote the money payable to the owner of a ship on the part of the shippers or consignees of goods, as compensation for detention beyond the time stipulated for her loading or discharge, as the same is expressed in the charter-party or bills of lading.

DEMURRER (*demorari*, to stay) is that pleading in an action at law, by which the party who demurs refuses to proceed with the pleadings towards an issue, and requires the judgment of the court whether, upon his opponent's own showing, sufficient statement has been made to sustain the suit. A defendant may also demur to the bill of a plaintiff in equity.

DEMUS. [ATTICA.]

DENAIN. [NORD.]

DENA'RIUS, a Roman coin of silver, so called from containing ten Asses. Some time after the first Punic War, the denarius became the representative of sixteen Asses, and, though Augustus reduced it to twelve, it continued subsequently at the value of sixteen as low as the time of Gallienus. It was the chief silver coin in Rome for 600 years, down to the time of Constantine I. The value of the denarii coined about the end of the commonwealth is 8½*d*. The earliest denarii are those which have the helmeted head of Rome, the Dioscúri, or the head of Jupiter, upon their obverse. Many of them had chariots, bigæ, or quadrigæ, represented on their reverses; such coins were called *bigati* and *quadrigati*. The half of the denarius was called *quinarius*, as containing five Asses; the quarter, *semistertius*, as containing two Asses and a half.

Denarius. British Museum. Actual Size. Silver.

DENARIUS AUREUS. [AUREUS.]

DENBIGH. [DENBIGHSHIRE.]

DENBIGHSHIRE, a county of North Wales, is bounded N. by the Irish Channel, W. by Caernarvonshire, S. and W. by Merionethshire and Montgomeryshire, E. by Shropshire and Cheshire, and N.E. by Flintshire. Its greatest length is 41 miles, and greatest breadth about 29 miles. The area is 633 square miles, or 405,120 acres. The population in 1841 was 88,866.

The western part of the county is occupied by a dreary range of hills, the Hiraethog range, which has several summits above 1000 feet in height. There is another range in the eastern part of the county, the Clwydian Hills, which has summits nearly 2000 feet in height; and there are minor ridges in other directions. The waters of Denbighshire find an outlet into the sea chiefly by the Conwy, the Clwyd, and the Dee, not one of which has its æstuary within the county. The Conwy carries off the waters of the western slope of the Hiraethog Hills: the Clwyd drains the country inclosed between the Hiraethog and the Clwydian Hills, except a small part which is drained by the Alwen, a feeder of the Dee; the Dee receives the waters of the rest of the county by several tributaries, of which the chief are the Rhaiadr, the Alwen, the Ceiriog, and the Alyn. A navigable feeder of the Ellesmere Canal traverses part of the county, and crosses the Dee by the aqueduct bridge of Pont Cysylltee. This bridge is a stupendous work: it is supported by nineteen pairs of stone pillars fifty-two feet asunder, and is carried over the river at the height of 125 feet above its bed. The trough through which the vessels pass is entirely composed of cast iron plates, and is 320 feet long, 20 feet wide, and 6 feet deep. The parliamentary mail-coach road from London to Holyhead passes through Denbighshire. The Shrewsbury and Chester Railway, now (June 1848) in progress, traverses the eastern part of the county; and the Chester and Holyhead Railway skirts the northern part.

In geological formation, the red marl or new red sandstone occupies a good portion of the county. The coal-measures which underlie the red marl furnish good coal, which is dug at Ruabon, and at Wrexham. Beneath the coal-measures are shale, sandstone, mountain limestone, old red sandstone, transition limestone, and slate, all of which come to the surface at different parts. A little lead ore and iron exists in the county.

Divisions, Towns, &c.—Denbighshire is divided into six hundreds. It is for the most part comprehended in the diocese and archdeaconry of St. Asaph: a small part is in the diocese and archdeaconry of Bangor, and several parishes are in the peculiar jurisdiction of the Bishop of Bangor. A very small part is in the diocese and archdeaconry of Chester. The number of parishes which are partly or wholly within the county is about 65.

Denbighshire is included in the North Wales circuit: the assizes are held at Ruthin; and the quarter-sessions alternately at Ruthin and Denbigh. It returns two members to parliament for the county, and one for the borough of Denbigh, to which Holt, Ruthin, and Wrexham are contributory. Denbigh is the chief place of county election.

The following are the principal towns, with the population of each in 1841:—

Denbigh, a parliamentary borough, municipal borough, and the capital of Denbighshire, is situated near a stream which flows into the Clwyd, on a rocky eminence, the summit of which is crowned by the ruins of the ancient castle. It consists chiefly of one long street, well paved and lighted, with a few good houses, leading into a spacious market-place, in which are the market-house and assembly-room. The castle was erected in the reign of Edward I. The castle walls were of extraordinary strength; but the castle was never quite finished. In Leland's time it was a large fortress with many towers, wards, and portcullises. The grand entrance to the castle, a magnificent pointed archway, in tolerably good preservation, still remains. The municipal borough is governed by 4 aldermen (of whom one is mayor) and 12 councillors. Population, 5238. The parliamentary borough returns one member.

Holt is on the river Dee, about 6 miles N.E. from Wrexham. The town is an irregular assemblage of small streets: the main street leads down to an ancient bridge over the Dee, by which Holt is united to the village of Farndon. Population of the township, 1058.

Llan Gollen stands on the south bank of the river Dee. The town does not possess any particular claims to notice; but the vale of Llan Gollen is interesting from its picturesque beauty and its antiquarian remains, and is much resorted to by tourists. The streets are narrow, and the houses are built of a dark shaly stone. The bridge was built by John Trevor, bishop of St. Asaph, who died in 1357; it consists of five arches, the widest not having more than 28 feet span. The river usually runs under only one arch, under which it has worn a deep channel in the hard rock which forms the bed of the river. Population of the parish, which contains several townships, 4906.

Llan Rust is situated on the east bank of the Conwy, in a pleasant vale surrounded with well-wooded hills. The houses are irregularly built, and the streets, with the exception of that in which the town-hall stands, are narrow. The bridge over the Conwy is from a design by Inigo Jones, and consists of three arches, of which the middle one has a span of 59 feet. The tide flows up to about a mile and a half from the bridge, and in spring-tides brings up boats of twelve tons. The parish extends into Caernarvonshire, and the entire population is 3905.

Ruthin is 8 miles S.S.E. from Denbigh. It is situated on the summit and slope of a considerable hill, at the foot of which flows the Clwyd. The town appears to have taken rise from the foundation of the castle, which was built by Roger Grey, to whom Edward I. granted nearly the whole of the vale of Clwyd. This castle got the name of Rhyddin, or the Red Fortress, from the colour of the stone of which it was built. It stood, not on the summit, but on the western slope of the hill, towards the Clwyd. The castle has been destroyed, and a new edifice, which from its style may be considered as a restoration of the ancient castle, has been erected on the site. The summit of the hill is occupied by the market-place, to which the principal streets lead. The county-hall or court-house is the finest building for the purpose in North Wales. The county prison is well built. The church is the choir of a more spacious conventual building, which was suppressed in 1310, and afterwards rendered collegiate. There are vestiges of the walls of the nave and a transept. The roof of the present church is admired for its curious workmanship. The free-school is a good building. There is an almshouse for 12 decayed house-keepers, 10 men and 2 women, which is called Christ's Hospital. Ruthin is a municipal borough, and is governed by 4 aldermen (of whom one is mayor) and 12 councillors. Population of the parish, 1331.

Ruabon, or *Rhuabon*, is a village at the junction of the two roads from Oswestry and Llan Gollen to Wrexham, 17 miles S.S.W. from Chester by the Chester and Shrewsbury Railway, which is completed (June 1848) as far as Ruabon. The church is spacious, and is adorned by some elegant monuments of the Wynne family, especially one by Rysbraeck. Population of the township, 657.

Wrexham is situated on a small stream which flows into the Dee, a few miles from the west bank of that river, and 12 miles S.S.W. of Chester, by the Chester and Shrewsbury Railroad. Wrexham is situated in the mining district of Denbighshire, and is one of the most important towns in North Wales. The houses are in general well built; the streets, which are wide and generally cross each other at right angles, are paved and lighted with gas. The church is a handsome and spacious Gothic building. The town-hall is a plain brick building. There are also a county house of correction, a union workhouse, and places of worship for various classes of Dissenters. Wrexham is contributory to the parliamentary borough of Denbigh. It is in the townships of Wrexham Abbot (population 2073) and Wrexham Regis (population 3745.)

History, Antiquities, &c.—Denbighshire, before

the conquest of South Britain by the Romans, was comprehended in the territory of the Ordovices. Two kistvaens, or stone cells, and some tumuli, are supposed to belong to this early period. Very little is known concerning the county under Roman dominion. In the Saxon times it became the scene of frequent struggles. To those times are referred the pillar of Eliseg, Offa's Dyke, Wat's Dyke, and one or two other ancient remains. The Britons (or Welsh) of this region were enabled to hold out against the attacks of the Saxons and Danes; but the consolidation of the power of England under the Norman princes again subjected the Welsh to the pressure of a superior hostile power. Denbighshire fell into the power of Edward I. *in* 1277, being ceded by Llewelyn, the last prince of North Wales, at the close of his first struggle with the ambitious and politic king of England. In the subsequent revolt of the Welsh prince and his brother David, in 1282, it reverted to its native masters; but the death of Llewelyn, and the execution of David as a traitor, again and finally placed it under the English dominion. The county was engaged in hostilities during the wars of the Roses, and during the wars of the Commonwealth.

DENDER. [HAINAULT.]

DENDERAH, the *Tentyra* of the Greeks and Romans, a ruined town of Upper Egypt, near the left or west bank of the Nile, and nearly opposite Keneh, is celebrated for its temple, which is the best preserved and one of the most splendid in all Egypt. Its remains occupy a vast extent of ground, and consist of various buildings and propyla, besides the temple itself. They are inclosed, with the exception of one propylon, within a square wall, the side of which is 1000 feet, and built of sun-dried bricks. The wall is in some parts 35 feet high and 15 feet thick. ('Egyptian Antiquities,' in 'Library of Entertaining Knowledge.')

DENDERMONDE, or TERMONDE, a fortified town in East Flanders, is built at the confluence of the Dender and the Schelde, 18 miles E. from Ghent by the Ostende and Malines Railroad, and contains 7300 inhabitants. It has 4 churches, 5 chapels, a town-house, an hospital, a lunatic asylum, an orphan house, 2 convents, and a college. The town is defended by a strong citadel. It was besieged by Louis XIV. with a large army in 1667, but he was forced to retire; again in 1706 it suffered a siege, which is more than once alluded to by Uncle Toby in Sterne's 'Tristram Shandy;' and in 1745 it was taken by the French. Dendermonde has manufactures of woollen cloths, hats, soap, cordage, and pottery; and a good trade in grain, linseed, hemp, and oil. Many Roman antiquities have been dug up in the neighbourhood. (Van der Maelen's *Dictionnaire Géographique de la Province de la Flandre Orientale.*)

DENDRO'BIUM, an extensive genus of East Indian Epiphytes, found in the whole of the damp tropical parts of Asia, and a little beyond the tropics in Japan and New Holland, but unknown in the rest of the world. About a hundred species have been enumerated.

DENDRO'DOA, Mr. W. S. Mac Leay's name for a genus of Ascidians [ASCIDIA], belonging to the aberrant group, or those which have a bronchial pouch with eight folds, the tentacula simple, and no liver. (*Anatomical Observations on the Natural Group of Tunicata*, by W.S. Mac Leay, Esq., A.M., F.L.S., &c., in *Linn. Trans.*, vol. xiv. p. 547.)

DE'NDRODUS, a genus of placoid fishes, from the old red sandstone of Elgin, Moray, and Russia.

DE'NDROMUS, a genus of rodent quadrupeds established by Dr. A. Smith in his 'Contributions to the Natural History of Africa.'—Example, *Dendromus typus*. This little murine animal inhabits the branches of trees in South Africa, in which situation it constructs its nest and rears its young. It is of a reddish brown above, whitish beneath. Length of head and body 3½ inches, of tail 4½ inches.

DE'NDROPHIS (Fitzinger), a genus of serpents of the colubrine section (*Ahaetulla*, Gray). The species of this genus have, like the *Dipsas* of Laurenti, a line of wider scales along the back, and narrower scales along the flanks, but their head is not larger than their body, which is very slender and elongated. Non-venomous. Locality, India and Africa.

DE'NDROPLEX, a genus of birds established by Mr. Swainson, and placed by him in the family *Certhiadæ*, or Creepers. The tail is rigid and graduated. The type of this genus has all the manners of a *Picus*, and, excepting in its perfectly straight bill, differs not from *Dendrocolaptes*.

DENEB, an Arabic word, signifying the tail: it generally means the bright star (β) in the tail of the Lion. [LEO.]

DENHAM, SIR JOHN, born at Dublin in the year 1615, was son of Sir John Denham, some time chief baron of the Court of Exchequer in Ireland. In the year 1631 he became a gentleman commoner of Trinity College, Oxford, where, after studying for three years, he took the degree of bachelor of arts. He subsequently entered himself at Lincoln's Inn. In 1641 he gained a great celebrity by his tragedy of 'The Sophy,' which was acted at Blackfriars with much applause; and his fame was increased by his 'Cooper's Hill,' written in 1643, almost the only one of his poems that is now read. In the year 1647 he performed many secret and important services for Charles I., and at the restoration of Charles II. he was appointed surveyor-general of his Majesty's buildings, and created Knight of the Bath. He died in the year 1688, his understanding having been for some time impaired by domestic grievances.

DENIER, from the Latin *denarius*, a French coin, originally of silver. It continued in use, through different modifications, as long as the old system of coinage in France lasted; that is till 1795. Up to that time, accounts were kept in France in livres of 20 sous or 240 deniers: they have been since kept in francs of 10 decimes, or 100 centimes.

DENINA, CARLO GIOVANNI MARIA, born in 1731, at Revello in Piedmont, studied at Saluzzo and Turin, took priest's orders, and was made professor at Pignerol in 1753. Having been

dismissed from this chair by the influence of the Jesuits, whom he had displeased by the liberality of his opinions on the subject of education, he went to Milan, but was soon recalled to Turin, and made professor of rhetoric in the High College. In 1782 he received an invitation from Frederic II. to repair to Berlin, for the purpose of writing a work on the revolutions of Germany. Denina accepted the offer, and repaired to Berlin, where he remained many years. In 1804 he was introduced to Napoleon at Mainz, by whom he was appointed imperial librarian. He then removed to Paris, where he died in December 1813.

His works are very numerous. Among the most important are:—'Istoria delle Rivoluzioni d'Italia,' in 25 books: 'Vincendo della Letteratura,' 4 vols. 8vo.: 'La Clef des Langues, ou Observations sur l'Origine et la Formation des principales Langues de l'Europe:' 'Tableau Historique, Statistique, et Moral de la Haute Italie:' and 'La Prusse Littéraire sous Frédéric II.'

DENIS, ST., an ancient well-built town in the department of Seine, in France, stands at the distance of five miles from Paris on the Paris and Boulogne Railroad, in 48° 56′ N. lat., 2° 21′ E. long., and has 14,636 inhabitants. It is traversed by the Croud and the Rouillon, small streams that enter the Seine on the right bank at a short distance from the town, and by a canal which connects the Seine with the canal of the Ourcq. The town was formerly fortified, but the ramparts are now converted into handsome promenades. It lies within the line of detached forts which form the outworks of the new fortifications of Paris; one of these forts is built across the road which enters the town from the north.

St. Denis dates its rise from the foundation of a chapel erected, A.D. 240, over the tomb of St. Dionysius or Denis. The chapel was afterwards replaced by an oratory, and, in the beginning of the seventh century, by a magnificent church erected by Dagobert I., who also founded the abbey of St. Denis, and was buried in the abbey church in 638. Succeeding kings added to the wealth and decorations of the abbey which was to receive their ashes. The church, commenced on a larger scale by Pepin le Bref, was finished by Charlemagne. The present abbey church dates from 1130, when Abbot Suger, regent under Louis le Jeune, built the portal, towers, vestibule, apsis, and the crypt, which contains the royal tombs. The nave was completed in 1281 by Abbot Odon. The western front is divided by buttresses into three compartments, which are crowned by a range of battlements. In each compartment is a wide semicircular arched doorway, the ascent to which is by a flight of steps running along the whole front. The upper part of the centre compartment is occupied by the clock. The doors are covered with grotesque bronze figures in bas-relief. The choir of this church formerly contained the tombs of most of the kings of France, and of several other eminent individuals. By a decree of the National Convention, July 31, 1793, the monuments were ordered to be demolished. In three days 51 tombs were destroyed and 51 royal graves brutally desecrated, the bones found in them being thrown pell-mell into two ditches opened on the north side of the church. Under the Directory the lead was stripped off the roof, the stained glass windows removed, and it was even in agitation to demolish the structure altogether. Under the consulate and the empire the restorations commenced; these have been continued through many subsequent years, so that the church of St. Denis presents now an appearance of greater splendour than it presented before the rude hands of republican violence assailed it. The mass of royal remains were removed by order of Louis XVIII. from the ditches into which they had been cast, and placed, together with those of Louis XVI. and Marie Antoinette, in the central vaults below the high altar. The crypt, which is entered by a descent of steps on either side of the choir, contains statues of the kings of France arranged chronologically from Clovis to Louis XVI.

The abbey of St. Denis was suppressed in 1792. The abbey buildings, a huge structure, are now occupied by the Institution for the Orphans of Members of the Legion of Honour. Among other remarkable buildings at St. Denis are the former convent and church of the Carmelites, and the infantry barracks to the north of the town.

The trade of St. Denis is considerable. Printed calicoes and other cotton goods are manufactured: there are several establishments for washing wool, bleaching linen, casting sheet lead, and making salt-petre, soda, and other chemical products. There are also several flour-mills for the supply of Paris. Other articles of trade are corn, wine, vinegar, wood, wool, and cattle. There are several fairs held in the year. At one of these, called the fair of Landit, which commences on the 11th of June and lasts a fortnight, vast numbers of sheep and a great quantity of manufactured goods are sold.

(Dulaure, *Histoire des Environs de Paris; Dictionnaire de la France;* Murray's *Hand-book of France.*)

DENIZEN, an alien born, who has been constituted an English subject by letters of denization granted by the crown through the home secretary of state. The facilities for an alien becoming naturalised, which the Act 7 & 8 Vict. c. 66, provides, will render it easier for aliens to obtain naturalisation than it was previously to obtain the lesser privilege of denizenship. A denizen is in a kind of middle state between an alien and a natural-born subject. [ALIEN.] He may take lands by purchase or devise, which an alien cannot. A denizen cannot transmit real property by descent to those of his issue who were born before his denization. A denizen, when otherwise qualified, may vote for members of parliament. A denizen cannot be a member of the privy council, or sit in either House of Parliament, or hold any office of trust, civil or military, or be capable of any grant of lands or other thing from the crown.

DENMARK, or DANMARK, is a kingdom lying between 53° and 58° N. lat., and 7° and 13° E. long. It is bounded N. by the Skager Rack and the Cattegat, S.E. by the Baltic; S. by parts of Lübeck, Hamburg, Mecklenburg-Schwerin, and Hanover; and W. by the North Sea. Its

colonial possessions consist of—Iceland, in the Atlantic; the Faröe Islands, in the North Sea; Greenland, in North America; five forts and their dependencies, on the coast of Guinea, in Western Africa; and the islands of Santa Cruz or Sainte Croix, St. Thomas, and St. John, in the West Indies.

Continental Denmark, which consists of Jütland and the duchies of Schleswig, Holstein, and Lauenburg, in its greatest length from north to south is about 304 miles; its breadth varies from about 33 to 106, the average being about 66. The coast line extends about 1110 miles, and is mostly flat. The surface presents an almost uniform plain, elevated only a few feet above the level of the sea, but occasionally relieved by some small groups of hills, the wooded summits of which break the monotony of the landscape, and, in combination with numerous inlets of the sea and small lakes, give the country a very pleasing appearance. The upper soil consists of a dense layer of clay or sand in most parts, mixed with gravel in some places; the sub-soil is a dark blue clay, entirely destitute of earthy matter, but partially intersected by a fine yellow sand. Sands and heaths are the characteristic features in continental Denmark; nearly 10,000 square miles of surface, out of a total area of 21,472, are thus occupied.

The western coasts of Jütland and Holstein are quite flat, and protected from the North Sea by sand-hills and dykes in South Jütland, or Schleswig. The eastern coasts of Jütland, as well as the island-coasts, are abrupt and precipitous. The north-eastern shores of the island of Seeland are separated from Sweden by the strait of the Sound, one of the three passages which lead from the Cattegat to the Baltic. The other two entrances into the Baltic are the Great Belt, between Seeland and Fünen; and the Little Belt, between Fünen and Alsen. [Belt.] The coast of Denmark is intersected by many inlets or fiords, of which the chief are Isc-Fiord, Roeskilder-Fiord, Liim-Fiord, Kingkiöpings-Fiord, and the Apenrade, Flensburg, and Eckernförd fiords.

Denmark abounds in small lakes, the most considerable of which are—the Mos See, Viborg, Skanderborg, Garbool, Langesee, Arresee, Esrumsee, Tüssee, Loroesee, Arreskoesee, Marienboersee, Ploener, Selentersee, and Ratzeburgersee. As no inland point is more than 35 or 40 miles from the sea, the country has no large rivers. The Elbe forms the southern boundary of Lauenburg for a considerable distance, and receives the Danish rivers Delvenau, Bille, Alster, and Stoer. The largest Danish rivers are the Eyder, which flows by Bördeshiolm, Rendsburg, and Friedrichstadt, to its discharge in the North Sea, near Tönningen; and the Trave, which flows by Giselrade and Lübeck, to its entrance into the Baltic at Travemünde: both are navigable throughout nearly their whole course. The remaining rivers of Denmark are mere streams. There are four large canals, viz. the Eyder Canal or Schleswig and Holstein Ship Canal, which connects the North Sea with the Baltic; Steckenitz Canal, which unites the Elbe with the Baltic; the Daneskiold Canal, which runs from the Great Belt into the heart of Seeland; and the Odensee Canal, which connects Odensee with the sea.

The proximity of the sea renders the climate of Denmark temperate, considering its latitude. The cold is greatest in North Jütland, and least in the adjoining islands. The weather is in general very variable; rains and fogs are of constant occurrence; storms are frequent; the winter cold is not severe, but the summer heats are at times overpowering. The humidity of the atmosphere is a great advantage to a country whose soil is of so sandy a nature. The thermometer seldom ranges above 77° Fahr. The barometer varies from 28¼° to 28° 6′.

The people of Denmark, with the exception of a few thousand Jews, are of Teutonic descent, but of four distinct races. The Danes, who inhabit Seeland and the circumjacent islands, North Jütland, and a small portion of Schleswig, were the Northmen of former times. The pure Germans inhabit the duchies of Holstein and Lauenburg and the greater part of Schleswig. The Frieslanders dwell along the western coasts of Schleswig and on the small islands in the North Sea. The Angles live between the Bay of Flensburg and the Schley on the Baltic. [Angles.]

The area and population of the Danish possessions in Europe, in 1840, were as follows:—

	Area in sq. miles.	Pop. in 1840.
Jütland . . .	9,480	548,698
Baltic Islands .	4,973	734,329
Schleswig . . .	3,445	348,526
Holstein . . .	3,300	455,093
Lauenburg . .	402	45,342
Faröe Isles . .	497	6,928
Iceland . . .	30,000	56,034
Total. . .	52,097	2,194,950

In the colonial possessions of Greenland, the three West India islands before mentioned and the dependencies on the coast of Guinea, there were respectively 7,552, 43,178, and 40,000 inhabitants (in all 90,730), in the same year.

Denmark is principally an agricultural state. The most fertile parts are the islands of Laaland and Falster, and next to them Seeland and Fünen; but agriculture is most skilfully carried on in the Baltic districts of Holstein. The Danes however are not generally good agriculturists; the causes of this are said to be, that the cultivator is rarely proprietor of the soil, that he is overburdened with dues and services, that there is too great an extent of common lands, that his capital is too small, and that property is too much subdivided. Of the whole area, about two-thirds are appropriated to arable land; one-twelfth to pasture and meadow; and one-twentieth to woods and forests. The average yearly produce is stated at about 8,000,000 quarters of corn; 2,000,000 tons of potatoes; and a proportionate quantity of other produce. Peas and pears, rapeseed, flax, hemp, and tobacco are grown: fruits and table vegetables are comparatively small in produce. The fine

forests once possessed by Denmark have been allowed so to decay, that the inhabitants are obliged to import wood from other countries. The chief timber-trees are pine, beech, oak, and birch.

The rearing of horses and cattle is an object of great attention. The horses are reared both for cavalry purposes and for draught. Cattle are reared chiefly for making butter, cheese, and salt beef, large quantities of which are exported. Sheep are reared principally for the flesh and the milk, and not much for the sake of the wool. Swine and poultry are largely reared. The fiords and rivers of Denmark are well supplied with fine fish, among which are herring, mackerel, cod, salmon, oyster, and flat fish. The herring fishery is a very important one on the coasts of Jütland, giving employment to 400 or 500 vessels, and nearly 2000 persons.

Denmark possesses no mines or metals whatever; nor any minerals of importance, except coals, freestone, and salt. Amber is collected on the Hitze, a sandbank on the western coast of Jütland. Potters' and porcelain earths are also obtained. Peat is got wherever there are swamps, and every village in those parts has bog-lands assigned for its supply.

Manufactures are but slightly developed in Denmark. Altona produces silk, woollen, and cotton goods, leather, soap, refined sugar, and tobacco. Lace is made on a very extensive scale in and about Tondern. There are large tobacco manufactures, but they are said not to produce more than one-eighth of the quantity consumed. The woollen and cotton manufactures are small in amount. There are a few establishments for linen, gloves, paper, and ironware. Straw hats, sailcloth, glass, soap, leather, salt-petre, gunpowder, and arms, plated goods, china and earthenware, beer and spirits, thread, refined sugar, soda, and potashes are among the productions of Danish industry. The brandy distilleries are rather numerous. The peasants' families make their own woollen clothing in general, which is composed of a coarse stuff termed wadmel; and indeed there are few articles of domestic use, whether utensils or for apparel, which are not made by their own hands.

There is probably no country in Europe better adapted or more favourably situated in many respects for commerce than Denmark. It is the key of the Baltic, and possesses peculiar advantages for a ready and cheap intercourse with all the maritime nations of Europe. Copenhagen, the capital, is the central point of the Danish foreign trade, which has been greatly favoured by the neutral policy which the government has endeavoured to pursue during the last hundred years and more. Navigation, in which above 50,000 hands are employed, is a great source of profit to the country, for the Danes navigate their vessels on cheaper terms than many of their competitors, and are excellent mariners, on which account they are the carriers for other countries, particularly to the Mediterranean and Levant. There is a brisk intercourse by sea between the several ports. The chief places of trade are Copenhagen, Altona, Kiel, Koersoer, Helsingör, Odensee, Viborg, Randers, Flensberg, Schleswig, Aalborg, Rendsburg, Tondern, Aarhuus, Glückstadt, Neustedt, and Itzehoe. Railways have been recently formed from Altona to Glückstadt, Rendsburg, and Kiel.

Denmark exports grain, butter, cheese, brandy, salted and smoked meats, horned cattle, horses, skins and hides, oil, eyder-down, fish, tallow, bristles, &c., and imports wines, salt, silk, wool, cotton, timber, coals, colonial produce, brandy, spirits, glass, drugs, &c. The merchandise imported into Great Britain from Denmark, in 1845, comprised, among its items, 2243 cwts. of butter, 360,000 quarters of corn, 30,000 quarters of seed; and the merchandise exported from Great Britain to Denmark in the same year comprised 247,000 lbs. of tea; 32,000 lbs. of coffee; 120,000 lbs. of tobacco; 6000 gallons of wine; 168,000 tons of coals; 560,000 bushels of salt; 36,000*l.* worth of cotton goods; 96,000*l.* worth of iron and hardware. The British and Irish produce sent to Denmark in 1845 was valued at 258,558*l.* In 1845 there were 1002 Danish ships (75,659 tons) which entered ports of Great Britain, and 1583 ships (123,259 tons) which cleared outwards from Great Britain. In an average of years, more Danish vessels visit England than vessels belonging to any other foreign country, although the aggregate tonnage is smaller than from the United States or from Prussia. British trade in Danish ports occupied, in 1845, 1168 vessels inwards, and 2654 vessels outwards; 287 laden vessels entered the Thames from Denmark in that year. In the two months ending March 5, 1848, 40 Danish vessels entered British ports, and 151 left British ports.

Denmark is an hereditary monarchy, founded on three fundamental laws; the Act of Sovereignty of 1661, the King's Law of 1665, solemnly ratified by the whole nation, and the Native Subjects' Law of 1776. As duke of Holstein and Lauenburg, the king is a member of the German Confederation. The sovereign must be of the Augsburg Confession of Faith, and must uphold its ascendancy in his dominions. By a decree of the 15th of May, 1834, the kingdom was divided into four electoral districts, each of which has at present its provincial assembly: these districts are the Danish Islands, Jütland, Schleswig, and Holstein. The consent of the provincial assemblies is necessary to all alterations in laws affecting persons or properties, public imposts, or requisitions for the national service; and they are allowed to propose laws for the king's adoption, and to lodge complaints against any of the public authorities.

The Danish navy in 1846 consisted of 31 vessels of war, carrying from 2 to 84 guns the total amount being 1126 guns; besides these it comprised several sloops and gun-boats. The peace establishment of the army in the same year consisted of 25,000 men; of these 3000 are cavalry and 4000 artillery. In time of war the land force is increased to 75,000 men.

The Lutheran is the predominant religion, but every other is tolerated. The affairs of the national church are under the superintendence of the eight bishops of Seeland, Laaland, Fünen, Ribe,

Aarhuus, Viborg, Als, and Aalborg, a general-superintendent, sixty-two provosts, and 1488 ministers. There are twelve religious communities in Denmark Proper and the duchies; a missionary college at Copenhagen; and a seminary for approved candidates in divinity in the same city. There are in Denmark 13 seminaries for educating teachers, upwards of 2500 primary schools, and 2000 others on the Lancasterian plan; 30 gymnasia or grammar-schools; and 2 universities, one in Copenhagen, founded in 1479, and the other in Kiel, founded in 1665. Among the public libraries are three in Copenhagen and one in Kiel.

The fortresses and fortified forts of Denmark are — Copenhagen, Cronburg Castle, Korsoer, Fredericia, Friedrichsort, Friedrichshaven, Rendsburg, Christiansoe near Bornholm, Nyborg, and Glückstadt. The chief military and naval establishments are—the Cadet Academy, Copenhagen; the Arsenal and Archive of Charts, in the same city; a cannon and ball foundry at Friedrichsvaerk; an invalid hospital at Eckernförde; and arsenals at Rendsburg and Randers.

History.—The earliest known inhabitants of Denmark were the Scandinavian Cimbri. The country is supposed to have fallen into the hands of the Goths about 250 A.D., and to have been divided by them into a number of petty states. The Danes became bold seamen, and made many predatory incursions on the shores of Britain, Normandy, Iceland, Spain, Italy, and Sicily. A chieftain named Gorm, or Worm, united the scattered fragments of the country into one kingdom, about the year 900; and his son introduced Christianity. Canute the Great, who possessed at one time Denmark, Norway, England, and part of Scotland, gave to Denmark her greatness, laws, and internal organisation.

After the death of Canute, 1036, a new dynasty was founded by Sven Magnus Estritson, which lasted for four centuries; it was a kind of feudal system which stripped the sovereign of his authority, rendered the Danish king dependent upon the voice of the prelates and nobles, levelled the peasant to the condition of a serf, reduced agriculture to the lowest ebb, and surrendered commerce into the hands of the German Hanse Towns. Margaretta, who became queen in 1387, conquered Sweden, which remained united with Denmark till 1523. In the latter year, after much turbulence and disorder, Sweden was severed from Denmark, but Schleswig and Holstein were united to it, the duke of those countries having been chosen king of Denmark and Norway. The struggles arising out of a partition of the greater part of Schleswig and Holstein between the king's brothers became a source of much subsequent mischief to Denmark, and was not terminated until 1773, when the alienated territory was recovered by the cession of Oldenburg and Delmenhorst to its then possessor, the grand-duke of Russia.

For a period of about a century Denmark was repeatedly at war with Sweden; but at length, in 1720, Sweden ceded the right of receiving the Sound-dues to the Danes, and the long-disputed claim of Denmark to the sovereignty of Schleswig was fully recognised. The subsequent hundred years were a period of continued tranquillity, during which the state rose, and enjoyed prosperity: the happiest fruits of this interval of peace were, the abolition of servitude among the peasantry, begun by Christian the Seventh in 1767, the extinction of the negro slave trade, and the establishment of greater liberty of the press. During the wars of the French Revolution, Denmark observed a strict neutrality; but in the early part of the present century she became involved in the tangled web of European politics; and, having England for her opponent, she was deprived of her colonies, and had her capital bombarded, and her fleet taken possession of in 1807. By the treaty of Kiel in 1814, Denmark accepted Pomerania in exchange for Norway. This province was in 1815 ceded by her to Prussia, in consideration of her receiving the duchy of Lauenburg and a large sum of money. In making peace with England, she recovered her colonial dominions, but with the loss of her fleet and the island of Heligoland. At the present time (June 1848) Denmark is engaged in hostilities with Prussia, in respect to Schleswig and Holstein. The question between the belligerents is one arising out of the multiform constitution of the Germanic Confederation, and the right of direct succession in the male line to the duchies, while the kingdom may descend through a female. Great Britain has offered her aid as a mediatrix.

DENNER, BALTHASAR, a German portrait painter, distinguished for the elaborate finish of his works. Of Denner's early life little is known; he was born in Altona in 1685, and, after having distinguished himself at the courts of several German princes, he came by the invitation of George I. to London. He spent a few years in England, and left this country in 1728. After performing various journeys in the north of Europe, he died at Rostock, in Mecklenburg, in 1749, or, according to Van Gool, at Hamburg, in 1747. Though Denner bestowed more labour upon his pictures than any painter probably ever did, he still contrived to paint a considerable number. There is the head of an old woman in the Gallery of Vienna, for which the Emperor Charles VI. gave him 4700 imperial florins. Denner's own portrait, in his forty-second year, in a similar style, is placed near it.

DENNIS, JOHN, was the son of a saddler of London, where he was born in 1657. He was educated at Harrow and at Cambridge, and took the degree of A.M. in 1683. He lived the improvident life of a literary adventurer, and died in 1734. He was a political writer, a poet, a dramatist, and a critic. It is as the last he is principally known, not from his own works, but from having been preserved in the amber of Pope's 'Essay on Criticism,' and 'the Dunciad.'

DENOMINATOR, the number of parts into which a unit is divided in any fraction; thus, in 7-10ths of a unit, 10 is the denominator. [FRACTIONS.]

DENON, DOMINIQUE VIVANT, BARON, was born of a noble family at Châlons-sur-Saône,

in 1747. In the early part of his active life he was attached to the embassies at St. Petersburg and at Naples; but the death of his patron, the Comte de Vergennes, occasioned him to adopt the art of design, for which he had always evinced a decided taste, as a profession. He accordingly left Naples for Rome, and in 1787 returned to Paris, where he was elected a member of the Royal Academy of Arts. He then revisited Italy, and spent five years at Venice, and some time at Florence. While in Italy his name was placed by the republican government on the list of emigrants and his property sequestrated; but he returned to Paris, and was restored to his former position. When Bonaparte set out in 1798 on his expedition to Egypt, Denon, who was his devoted admirer, accompanied him, though then in his fifty-first year. He accompanied General Desaix in his expedition into Upper Egypt, and during the whole stay of Napoleon in the East he was indefatigable in drawing all the most interesting and striking Egyptian monuments. He returned with Napoleon to France, and in the short space of about two years published his great work on Egypt—'Voyage dans la Basse et la Haute Egypt, pendant les Campagnes du Général Bonaparte,' 2 vols. folio, 1802. Other editions in 4to. have been since published both in Paris and London. This work, as the production of an individual, is a noble monument of zeal, industry, and ability. About the time of its publication Denon was appointed by Napoleon Directeur-Général des Musées, a post of great influence; but he was deprived of it at the Restoration. Napoleon also created him a baron. After his retirement, he occupied himself in preparing a general history of art, of which he did not live to complete the text. The incomplete work was published by his nephews in 1829, in 4 vols. folio, under the title 'Monumens des Arts du Dessin, chez les Peuples, tant anciens que modernes, recueillis par le Baron de Denon, pour servir à l'Histoire des Arts,' &c. Denon died at Paris in 1825.

DENSITY, properly speaking, has no absolute meaning, but it is a term which may be considered as representing the number of material particles in a body. Thus gold is more dense than air, because probably, under equal volumes, gold contains a greater number of particles than air. The measure of the density of any body is called its specific gravity. [Specific Gravity.]

DENSITY OF THE EARTH. [Weight of the Earth.]

DENTA'LIUM, a genus of testaceous Mollusks, whose place in the animal series was first satisfactorily determined by M. G. P. Deshayes. Rondelet considered the Dentalia as marine shell-worms (vermisseaux de mer), though he noticed them as worthy of particular attention. Lister introduced them at the end of the limpets (Patellæ); Lang followed in nearly the same steps, separating after the Patellæ a section wherein he arranged, together with the Dentalia, all the calcareous tubes of Annelids then known. Breyne placed his genus *Tubulus*, containing the Dentalia, &c., at the head of his *monothalamous shells*, the first of the two grand orders, *the Monothalamous* and *the Polythalamous*, into which he divided the Testaceans. In this position Dentalium was separated from the Patellæ by all the other univalve shells comprised in the *Cochlidia*, as well as by the polythalamous series; in short, by the entire interval of the univalve Testaceans, Breyne, as M. Deshayes observes, having probably considered the Patellæ as the passage from the univalves to the bivalves; for he places them immediately before the latter. Tournefort gave the Patellæ a position at the head of the univalve shells; and at the end, before the Bivalves, he placed the *Dentalia*, *Entalia*, and the other marine testaceous tubes. D'Argenville, in his 'Zoomorphose,' appears to be the first who attempted to give any notion at all approaching to reality of the animal, the result of a note and drawing which had been sent to him from India. Though the materials were too incomplete to furnish secure data for fixing its position, they gave information which former authors had not enjoyed, and there was certainly enough to prevent D'Argenville from placing it in the heterogeneous third division of his system, denominated by him the Multivalves. Linnæus arranged it immediately after *Patella*, and before *Serpula*, stating the animal to be a *Terebella*, and the shell to be univalve, tubular, straight (*recta*), monothalamous, and pervious at each extremity. Brugnière gave it nearly the same position: but, if both these zoologists were right in making Dentalium follow Patella, they were as far wrong in placing it by the side of *Serpula*, *Teredo*, *Sabella*, and, above all, *Aspergillum*. Lamarck, in his 'Système des Animaux sans Vertèbres' (1801), arranged Dentalium with *Terebella*, and other genera analogous in appearance. In the 'Philosophie Zoologique' he separated the class of worms of the *Système* into two other classes, and formed the 'annelids,' with the section of external worms (vers extérieurs). He elevated, observes M. Deshayes, this division sufficiently in the series of *Invertebrata*, the presence of a heart and a circulation making it approximate to the mollusks; whilst the 'worms,' very inferior in organisation, remained between the soft *Radiata* and the *Insects*. In this new class, adds M. Deshayes, we find the Dentalia in the same section with *Serpula*, *Spirorbis*, and *Siliquaria*. This arrangement was not altered in 'L'Extrait du Cours,' published in 1811. But in the great work of the 'Animaux sans Vertèbres,' Lamarck, assisted by the labours of Savigny, and deceived, moreover, by the communications of M. Fleuriau de Bellevue, considered *Dentalium* as approximated to *Clymene*, and placed it in the family of *Maldanians* of M. Savigny. Systematic authors, generally, not knowing more than Lamarck did, that knowledge being confined to the tube, followed Lamarck's opinion. Cuvier, in the first edition, placed it among the *Annélides Tubicoles*, between *Aspergillum* (*Penicillus*, Lam.) and *Siliquaria*. Savigny, in his 'Système des Annélides,' gave a summary description of the animal; but it was too incomplete to decide the question finally, though sufficient to overthrow the observations of M. Fleuriau de Bellevue. The *Dentalium Entalis*,

which was sent to Savigny by our countryman Leach, gave sufficient information to that celebrated zoologist to enable him to say that the animal had no trace of rings, that it had no hairs (*soies*) on the lateral parts of the body, that it was essentially muscular, and that it could no longer remain among the *Chætopods*.

Dentalium Entalis was the species on which M. Deshayes made his observations; and in a very interesting and elaborate paper read before the Society of Natural History of Paris, on the 18th of March, 1825, he gave the facts which led him to the conclusion stated at the commencement of this article.

The species of this genus are very numerous, and widely distributed: they are sometimes found in deep water, frequently near the shore.

Fossil Dentalia.—The marine beds of the tertiary formations abound with fossil dentalia, some of which are not easily distinguishable from the recent species; they occur in the London clay, the calcaire grossier, the arenaceous limestone near Bognor, the Folkstone marl, &c.

(See Mr. G. B. Sowerby's *Observations on M. Deshayes' Monograph*, in *Zoological Journal*, vol. iv. p. 195.)

DENTA'RIA, a genus of plants belonging to the natural order *Cruciferæ*. The Coralwort, *D. bulbifera*, is the only British species of this genus. The flowers are rose-coloured or purple. It is a rare plant in England; but it is found in the neighbourhood of Tunbridge Wells.

DENTA'TUS, the surname of the Roman consul Curius, who defeated King Pyrrhus near Tarentum. He is said by Pliny to have been born with teeth, and to have received the name Dentatus from this circumstance. He gained several victories over the Samnites, Sabines, and others, and was remarkable for his great frugality. When the ambassadors of the Samnites went with a quantity of gold to attempt to bribe him, they found him cooking some vegetables on his fire, and were dismissed with the reply, that he preferred ruling the rich to being rich, and that he who could not be conquered in battle was not to be corrupted by gold. (Florus, i. 15.)

DENTA'TUS, LU'CIUS SICI'NIUS, a Roman tribune, who distinguished himself in battle chiefly against the Æqui and the Sabines. Livy calls him Lucius Siccius (iii. 43). According to Valerius Maximus he had been in 120 engagements, had forty-five wounds in the breast, and had received an accumulation of honours almost incredible. Through the jealousy and treachery of Appius Claudius he was murdered by the soldiers whom he was appointed to command. (Livius, iii. 43.)

DENTITION, the formation and evolution of the teeth. The varied processes by which the teeth are formed, developed, and arranged are among the most curious and complicated operations of the animal economy. The different stages of dentition, in the human being, mark distinct epochs of human life, in which many important changes occur in the physical frame, simultaneously with which new mental powers are developed.

The teeth differ in their organisation in several important respects from all other organs of the body. They are of a bony structure, and are placed in the arches of the upper and lower maxillaries, or jaw-bones. They consist of two sets, of which the one is intended to last only for a short time, while the other is destined to last during the whole term of life. The first are called the temporary, and the second the permanent teeth. The temporary teeth, twenty in number, are in general considerably smaller than the permanent, have a less firm and solid texture, and their characteristic forms and prominences are much less strongly marked. The permanent teeth, thirty-two in number, are arranged in perfect uniformity, eight on each side of each jaw, those of the one side exactly corresponding with those of the opposite. They are divided into four distinct classes, which present specific differences in size, form, development, articulation, and use; namely, on each side of each jaw, two incisores, one cuspidatus, two bicuspides, and three molares.

The age at which the temporary teeth first make their appearance varies considerably, frequently without any apparent reference to the constitutional powers of the child. Instances are not wanting in which children have been born with two or more teeth. In many other cases the teeth have not come through the *gum* until fourteen or sixteen months, or even as late as two or three years. In general however dentition may be said to commence at the age of from five to eight months. It usually proceeds in the following order, the teeth of the inferior jaw almost always preceding those of the superior for a longer or shorter time:—

From	5 to 8	months,	the four	central incisores.
„	7 to 10	„	„	lateral incisores.
„	12 to 16	„	„	anterior molares.
„	14 to 20	„	„	cuspidati.
„	18 to 36	„	„	posterior molares.

These periods are however only given as a general rule, which is liable to continual exceptions, not only in the time at which the different teeth appear, but also in the relative order of their precedence.

According to Dr. Ashburner, the teeth of the first dentition commonly cut in couples; the two anterior incisores of the lower jaw appear first; then, in perhaps from fifteen to twenty days, the two anterior incisores of the upper jaw come through; to these succeed the lateral couple of incisores of the lower jaw; then come those of the upper jaw. After these the two molar teeth nearest to the lateral incisors of the lower jaw appear; then the first molar of the upper jaw; after which come the lower two canine; then the upper canine; then the two second molar of the lower jaw, and afterwards the corresponding molar of the upper jaw. The period occupied in the process is about two years from the appearance of the first tooth.

The first formed of the permanent teeth are the anterior molares, on which the first point of ossification may be seen at birth. At about the age of twelve months the ossification on these teeth has proceeded to a considerable extent, also on the permanent incisores; and it has commenced on the lower cuspidati, the upper ones being generally

two or three months later. About the time when all the temporary teeth have made their appearance, ossification is found on the points of the bicuspides, and the bony shells of the teeth before mentioned have acquired considerable size.

Most of the permanent teeth are larger than those which precede them. They are placed during their progress a little behind them; hence they are confined within the segment of a smaller circle; consequently, as they approach more and more nearly to their ultimate size, they must become very much crowded in the jaw.

The mode in which the change from the temporary to the permanent teeth is effected, which constitutes the shedding of the teeth, is by a process of absorption. The anterior parietes of the cavities in which the permanent teeth are contained are removed by the absorbent vessels, in consequence of which the teeth are allowed to advance; next the sockets, then the roots, and lastly the crowns of the temporary teeth are absorbed. This absorption cannot be solely the effect of pressure produced by the advancing permanent teeth; for the process goes on when such pressure cannot possibly have existed. Neither do the advancing permanent teeth displace the receding deciduous teeth; but the jaw grows and enlarges consentaneously with the increasing bulk and number of the teeth which it is destined to receive.

The change of the temporary for the permanent teeth commences, in the majority of instances, at about seven years of age. The following are about the medium periods at which the different permanent teeth are generally cut, but so irregular are they in this respect, that comparatively little dependence can be placed on such a statement. Those of the lower are here indicated, and they most commonly precede the upper by about two or three months.

	Years.
Anterior molares . . .	6½
Central incisores . . .	7
Lateral incisores . . .	8
Anterior bicuspides . . .	9
Posterior bicuspides . . .	10
Cuspidati	11-12
Second molares	12-13
Third molares, or dentes sapientiæ	17-19

DENTITION, DISEASES OF. (*Difficult Teething.*) The process of dentition even when accomplished in a perfectly natural manner, is almost always attended with some degree of local inflammation. The gum itself is red and swollen, and is apparently painful and itching, indicated as well by the obvious occasional uneasiness of the infant, as by the constant desire it evinces to press against the gum every thing it can lay hold of. The irritation of the gum extends to the salivary apparatus placed in the mouth and its neighbourhood, as is proved by the increased flow of saliva, which is commonly more or less altered in quality, as well as increased in quantity, being thicker and more tenacious than the natural secretion. These symptoms of local irritation are usually accompanied by a slight degree of constitutional disturbance, the skin being commonly hotter and drier, the face occasionally flushed, the bowels more relaxed, and the infant itself more restless and fretful than is natural. The irritation of the gum when restricted within a moderate limit seems to be the necessary consequence of the developmental process that is going on. It is however when this process goes on in a system predisposed to disease that we find it productive of serious results.

The irritation attendant on abnormal dentition commences in a portion of the mucous surface of the digestive apparatus, and from its source in the mouth it is readily propagated to the stomach, intestines, and liver, producing in the stomach pain, nausea, vomiting, flatulence, acid eructations, &c.; in the intestines, griping pain, flatulence, diarrhœa; in the liver, disordered secretion of bile, in consequence of which the fæcal evacuations are greatly altered in quantity and quality, being at one time too scanty, and at another time too copious, sometimes light or clay-coloured, and at other times dark-green, spinach-like, and preternaturally fœtid, mixed with large quantities of unhealthy viscid mucus. The kidney is also sometimes affected.

The external skin, sympathising with the irritation set up in the internal mucous surface, is constantly affected with eruptions of various names and natures, sometimes attacking the scalp, sometimes surrounding the lips and extending over the face, and at other times covering the whole body.

The irritation is propagated from the mucous membrane of the mouth and fauces to that of the air passages and air vesicles, inducing hurried, difficult, and painful respiration, frequent cough, and all the symptoms of inflammation of the lungs, ending frequently in the development of tubercles, and the production of other organic and fatal diseases of the lungs.

One of the most fatal diseases brought on by dentition is *hydrocéphalus acutus*, or water in the head. This disease, is preceded by the start in sleep, the slight chill hardly amounting to rigour, the flushed face, the sudden darting transient pain in the head, the unusual drowsiness, and then come the sudden start from that deep sleep with a loud scream, the injected eye, the dilated pupil, followed by the constant rolling of the head upon the pillow, the loss of sight, and the progressively increasing insensibility, and coma. The irritation thus produced in the spinal cord and brain is quickly reflected back upon those muscles the action of which depends upon an influence derived from these great nervous centres—the muscles of volition, which are affected with twitchings, spasms, convulsions, sometimes passing into chorea, epilepsy, catalepsy, and tetanus.

Besides all these evils produced by abnormal dentition, there is one specific disease that results from it of a most formidable nature, and often fatal. This affection may be termed the disease of development; it is commonly called infantile remittent fever. The accession of this disease is denoted by languor, lassitude, chilliness, shivering, succeeded by heat of skin, perspiration, and accelerated pulse. Sometimes this ailment is slight in degree, or it may assume an acute form with all the fire and anger of a hot fever. Sometimes it is typhoid in its type. Whatever character may be

assumed by this disorder, it is coincident with an irregular course of the development of some organ of the body; and commonly the irregular development is in the nutrient organs, and of these most commonly the teeth and jaws.

Disease arising from abnormal dentition is not confined to the period of infancy. In children of irritable constitutions in whom the maxillæ are imperfectly developed, the irruption of the second or permanent teeth is sometimes attended with serious and even fatal disorders. Nay, even the period of adolescence is by no means free from severe diseases produced by this same cause: for in consequence of the development of some of the teeth having been preternaturally delayed, or in consequence of an imperfect development of the jaws at the period when the dentes sapientiæ are about to appear, delicate, nervous, and irritable subjects are not unfrequently affected with swelling of the parotid and submaxillary glands, painful and sometimes periodical affections of the ear and face, slight or recurring ophthalmia, irregular convulsions, epilepsy, and chorea; which affections have disappeared at once upon the irruption of the teeth or the removal of the local irritation.

The treatment of the various and formidable diseases produced by abnormal dentition must be conducted with a constant reference to the causes on which they depend. Without a proper regulation of the diet, clothing, air, exercise, and the state of the bowels, nothing can be effectually done to prevent the occurrence of the most formidable of these evils. In most cases where these evils are present, the relieving the pressure of the tooth against the gum will be of the most effectual service. This is done by cutting down upon the tooth through the gum. This operation, properly performed, may frequently be the means of saving the life of a child.

DEODAND (*deodandum*, what is due to God). The word deodand expresses the notion of a thing forfeited because it has been the immediate cause of death. The thing forfeited is sometimes called deodand, which signifies any personal chattel which is the immediate cause of the death of a human being. In England deodands were forfeited to the king, to be applied to pious uses and distributed in alms by his high almoner; but the crown most frequently granted the right to deodands, within certain limits, either to individuals for an estate of inheritance or as annexed to lands. An Act to abolish deodands was passed Aug. 18, 1846 (9 & 10 Vict. c. 62).

DEOLS, or BOURG-DIEU. [INDRE.]

DEPARTMENT, a territorial division of France which superseded the old partition into provinces, and was established in 1789. The original sketch of the plan is printed in the 'Histoire Parlementaire,' vol. iii. The departments are named from the rivers which drain them, from the mountains which they contain, from their situation, or from some remarkable locality. They are subdivided into Arrondissements, into Cantons, and into Communes. In the whole territory of France, which includes Corsica, there are 86 departments, 363 arrondissements, 2835 cantons, and 37,021 communes.

A *commune* is the smallest territorial division in the present system of France. In the rural districts, and in the smaller towns, a commune may be considered as equivalent in area and population to our ordinary parishes. It is only in respect of area and population that we compare the communes of France with our own parishes: the two divisions were made for different purposes, the parish being an ecclesiastical division, which existed in France as well as in England, while the commune was for civil or military purposes. There is moreover this difference, that, while our larger towns consist of several parishes, the larger towns of France, with the exception of Paris, form but one commune. Each commune has its church and its *curé* or clergyman. Some have also *succursales*, or chapels of ease. The larger towns have several churches.

The local administration and the revenues of each commune are placed in the hands of a municipal body, which consists of a *maire* 'mayor' and one or more *adjoints*, or assistants, and a certain number of councillors. In the larger communes the mayor and his assistants are appointed by the central government, and in those of smaller size by the prefect; but they must be selected from among the councillors, who are elected by the inhabitants. The duties of the mayor may be compared to those which are discharged by the overseers of the poor and the churchwardens and overseers of the highways in an English parish; but he is also a ministerial officer, and executes the orders of the prefect or those which are transmitted through him by the central government. The mayor has the absolute right of appointing local officers in some cases, but in others he must have the approbation of the council and the sanction of the prefect. The municipal council *determines* matters relating to the public property of the commune, and executes its own decisions, provided that within thirty days they are not annulled by the prefect. It *deliberates* on subjects affecting the immediate interests of the commune, and is authorised to express its views and wishes generally on all objects of local interest. A certain class of expenses, which are enumerated in the municipal law, are obligatory: such as the payment of municipal officers, the keeping in repair the town-hall, a portion of the expenses of public instruction and the national guard, the cost of foundlings, of public cemeteries, &c. Every commune is bound to maintain a primary school, or to unite with another commune for that purpose. These schools are supported by a government grant and by a communal tax.

A *canton* is a division consisting of several communes (the average is about 13); over each a judicial officer entitled *juge de paix*, justice of the peace, is appointed. These functionaries receive a small salary; they decide civil suits for sums under 50 fr.: and all suits whatever must be heard by one of them (in order that he may if possible bring the parties to an agreement) before the cause is carried into a higher court. The number of juges de paix is 2846. They are appointed by the government, but are not removeable at pleasure. (See the end of this article.) Each

juge has a *greffier*, or clerk, and to each court are attached one or two *huissiers*, or bailiffs.

An *arrondissement* comprehends several cantons (the average is nearly 8). Each arrondissement is under the administration of a *sous-préfet* (sub-prefect), subordinate to the prefect of the department. He receives and settles the accounts of the mayors of the several communes. He is assisted by a council, which consists of not fewer than nine members, but it may number as many as there are cantons in the arrondissement. This council, in which the sub-prefect has the right of speaking, deliberates on the allocation of the contingent of direct taxes for the arrondissement, and apportions the amount to be paid by the different communes. Councils of arrondissement are authorised to make a report to the prefect of the wants and condition of the arrondissement. As the capital of the department is also the chief place of an arrondissement, the prefect and prefectorial (not the departmental) council discharge in that arrondissement the duties which in the other arrondissements are assigned to their respective sub-prefects and councils.

At the head of each department is an officer entitled *préfet* (prefect), who is appointed by the central government, and has alone the administration of the local government. His usual residence is at the departmental capital; but he makes every year a circuit of inspection through his department, and gives an account of the result of his circuit to the minister of the interior. The prefect is assisted by a *conseil de préfecture* (prefectorial council), consisting of three, four, or five members, which decides upon appeals for an exemption from or a reduction of the direct taxes, and upon questions arising from the execution of public works. The prefect, when present at the sittings of this council, acts as chairman, and in case of equal division has a casting vote.

In each department there is a *conseil général*, or general council, with as many members as the department contains cantons, but the number must not exceed thirty. Each canton elects a member. The council assembles annually; its sittings are private; and on the demand of four members the votes may be taken by ballot. The chief business of this council is to apportion between the arrondissements the direct taxes which are required by the general government; to hear and determine upon appeals made by the councils of arrondissements against this assessment; to levy, within certain limits fixed by law, an additional tax to meet the expenses of the local administration; to audit the account yearly rendered by the prefect of the expenditure of this local revenue; and to express, in a report addressed to the minister of the interior, an opinion upon the condition and wants of the department.

The departments and arrondissements are electoral divisions. The members of the Chamber of Deputies under the Monarchy were chosen, and the members of the present National Assembly of the Republic are chosen, for the departments, not for single towns, however important or populous; so that the deputies are all, according to our phrase, county members. Since the Revolution of Feb. 23, 1848, the mode of voting is direct and by ballot, and the suffrage may be exercised by every male of 21 years of age who can produce a register of his birth. For every 40,000 of the population a deputy is returned to the National Assembly, which consists of 900 members

Each arrondissement has a court of justice, entitled *tribunal de première instance* (tribunal of first instance), which, except in a very few cases, has its sittings at the capital of the arrondissement. These courts commonly consist of three or four ordinary and two or three supplementary judge. To each court there is a *procureur général*, or public prosecutor; and where the court consists of two or more sections (as is the case in large towns) there are deputy procureurs. Each department has a *tribunal criminel* (criminal court), or *cour d'assize* (assize court), consisting of a president, who is a counsellor of the Cour Royale, to the jurisdiction of which the department is subject, two ordinary judges and two supplementary judges: to each court is attached a procureur and a greffier, or registrar. These courts, except in a few instances, have their seat at the capital of the department. Besides these courts, there are, in different parts of France, 27 higher tribunals, called *Cours Royales*, consisting of from twelve to thirty-three salaried judges. Each of these courts has under its jurisdiction several departments. There is an appeal from them on questions of law, not of fact, to the supreme court, *cour de cassation*, at Paris. [CASSATION.] The departments are also grouped into 21 *divisions militaires*, or military districts, the head quarters of which are fixed usually at the capital of one of the included departments. Each military division is under the command of a general field officer, who is immediately subject to the minister of war. The departments are also grouped into divisions for other objects of central government: 1, as to bridges and highways; 2, forests; 3, mines.

A department usually constitutes an ecclesiastical diocese. In a few instances two departments are comprehended in one diocese; and in one or two cases a department is divided between two dioceses. The dioceses of France amount to 81, of which 15 are archbishoprics and 66 bishoprics.

For purposes of education France has 27 university academies; each of these is governed by a rector and two inspectors, comprises several faculties, and is connected with the communal and other colleges spread over the departments under its jurisdiction. University academies are established in most instances in those towns in which Cours Royales are held.

By the constitution of the Republic some changes have been recently introduced in regard to the magistracy, the principal of which, as far as has yet been made public, are—that the *juges de paix* are to be elected by universal suffrage and directly in their several districts; that the judges of the *Cour de Cassation* are to be elected by the National Assembly; and that all magistrates are to be irremoveable.

DEPARTURE, a nautical term for the number of miles which a ship has sailed east or west. Thus, supposing a ship's course to be oblique to

the meridian, there is a right-angled triangle, of which the hypothenuse is the course sailed over; one side of the meridian is the difference of latitudes of the beginning and end of the course (reduced to miles), and the other side, perpendicular to the meridian, is the *departure*.

DEPLOY, to extend in a line of small depth an army, a division, or a battalion which has been previously formed in one or more columns: this may be done either for a review or preparatory to making a charge upon the enemy.

DEPOSIT has various meanings. A proper deposit (the Roman *depositum*) signifies a moveable thing which a man puts in the hands of another to keep till it is asked back, without any thing being given to the depositary for his trouble. The depositary is bound to take care of the thing, and to make good any damage that happens to it through fraudulent design (*dolus*) or gross neglect. Money is sometimes said to be deposited with a banker; but such a deposit is a loan, which the banker is bound to repay on demand, with or without interest, according to the agreement. Specific coin may be a deposit, like any thing else, if the agreement be that the specific money must be returned. Any other use of the term deposit than the strict use here explained is an improper use of the word, and any other transaction which is called deposit will be found on examination to be something different from deposit.

Among the Romans a deposit, if not returned on demand, was recovered by an *actio depositi*. [DETINUE.]

DEPOSITION means the giving of public testimony, but as applicable to English law the word is used to signify the testimony of a witness in a judicial proceeding, reduced to writing. Informations upon oath and the evidence of witnesses before magistrates and coroners are reduced into writing in the very words used by the witnesses, or as near as possible thereto. Evidence in the Court of Chancery is taken in written answers to interrogatories, which are also in writing, either by commissioners appointed for that purpose in the particular cause, if the witness resides at a greater distance from London than twenty miles, or if he resides nearer, or is otherwise willing to appear, before the examiners of the Court of Chancery. These depositions are the evidence which is read at the hearing of the cause. The course of the Ecclesiastical Court is also by written interrogatories and answers. The Court of Chancery has power to grant a commission for the examination of witnesses residing abroad; and by the 1 Wm. IV. c. 22, which extends the provisions of the 13 Geo. III. c. 63, the courts of law at Westminster, in actions pending before them, have power to order the examination of witnesses residing in any of the foreign dominions of Great Britain.

When a witness is above the age of 70, or very infirm, or about to go abroad, so that his testimony may be lost before the regular period for his examination arrives, the Court of Chancery will order him to be examined *de bene esse*, as it is termed; that is, his examination is received for the present, and will be accepted as evidence when the proper time for taking the other evidence in the cause arrives, if the witness cannot be then produced. Courts of law do not possess similar power without the consent of both parties; but, in order to enforce consent, they will put off the trial at the instance of a defendant, if the plaintiff will not consent, and, if the defendant refuse, will not give him judgment in case of nonsuit.

The Court of Chancery will also, upon bill filed by a person in the possession of property, and who has therefore no means of making his title the subject of judicial investigation, but which nevertheless may be materially affected by the evidence of living witnesses, allow the witnesses to be examined in *perpetuam rei memoriam*, that is, to perpetuate testimony. This is done in order that if any of the witnesses should die before the title to the property is disputed, their evidence may be preserved.

Depositions are not admitted as evidence in courts of law, unless the witness is dead, or, from some cause beyond the control of the party seeking to read the deposition, cannot be produced, or against any other persons than the parties to the proceeding in which they were taken, or claimants under them, and who had the opportunity of cross-examining the witness. In cases relating to a custom, prescription, or pedigree, where mere reputation would be good evidence, a deposition may be received as against a stranger.

DEPRESSION OF MERCURY is intended here to signify the diminution of the height of the column of mercury in the tube of a barometer in consequence of a small quantity of air which, from accidents in carriage or otherwise, may get to the upper extremity of the tube, and there act, by its elasticity, on the head of the column. When the barometer is to be employed in determining the relative heights of ground, it may not be possible to get this air out of the tube by any means in the power of the observer, and it then becomes necessary to have a formula by which a correction may be applied to the observed height of the mercury at any station, in order to have the height at which the top of the column would stand if the tube were free from air.

The formula for the corrected height of a column of mercury in a tube having air at the upper extremity is founded on the principle that the elastic forces of air, when made to occupy unequal volumes of space, are inversely proportional to those volumes. Therefore, at any place and at one time, let the height of the column of mercury in a barometer-tube free from air be read, also let the height of the column in the defective barometer be read (in both cases above the surfaces of the mercury in the cisterns), and let the difference of the readings be represented by h. At the same place and time let the distance between the upper extremity of the tube and the top of the column in the defective barometer be read, and represented by a. On removing the instrument to another station let the observed distance between the upper extremity of the tube and the top of the column be represented by b: then, h representing the observed height of the column of mer-

cury at the second station, and h' the corrected height, or the height of the column in a tube free from air, the required formula will be :—

$$h' = h + \frac{al}{b}.$$

DERBEND. [GEORGIA.]

DERBY, the capital of Derbyshire, is situated on the west bank of the Derwent, in 52° 55′ N. lat., 1° 29′ W. long., 126 miles N.N.W. from London, by the road through Northampton and Leicester, or 132 miles by the North-Western Railway, through Rugby and Leicester.

The municipal and parliamentary limits of the borough of Derby coincide. All that can properly be considered as the town of Derby is within the borough limits.

Derby appears to have risen from the ruins of the Roman station, Derventio, which was on the site of Little Chester, a hamlet just out of the boundary of the borough and on the opposite side of the river. In the time of the Saxons Derby was called Northworthige. The name of Deoraby (Derby) is said to have been given it by the Danes, by whom it had been captured. Derby was recovered from the Danes by Ethelfleda, countess of Mercia, and daughter of king Alfred, who took the castle by storm, A.D. 917 or 918. In the time of Edward the Confessor, Derby was a royal burgh, with 243 burgesses, but at the time of the Norman survey the town had only 140 burgesses. The castle probably went to ruin about the same time. In December 1745, the young Pretender, with his army, entered the town, but stayed only two days, retreating into Scotland on the approach of the Duke of Cumberland.

The town of Derby has received many charters; one each from John, Henry VI., Edward VI., James I., and Charles I., and two from Charles II. Under the Municipal Reform Act, Derby is divided into 6 wards, and has 12 aldermen and 36 councillors. The population in 1841 was 32,841.

Derby is situated in a luxuriant and well-cultivated vale, surrounded with beautiful scenery. The streets in the older parts of the town are narrow and winding. The houses are mostly of red brick, the public buildings of stone. The churches of Derby are seven, one for each of the five parishes in which it is situated, and two new churches, St. John's and Trinity. The new town-hall, between the old and new markets, is a handsome building with an Ionic portico on an elevated basement through which is the communication between the old and new markets. The county-hall is a large but heavy building of freestone, erected in 1660: new buildings have been erected behind the county-hall for holding the assizes and quarter-sessions. The borough gaol is a substantial and convenient building; it was formerly the county prison, but a better classification of prisoners being required it was sold by the county to the corporation, and a new county prison, with every convenience for classing the prisoners, has since been erected. Derby has a theatre and an assembly-room. There are places of worship for Methodists, General Baptists, Presbyterians, Independents, Particular Baptists, Quakers, Roman Catholics, and Swedenborgians. There is a stone bridge of three arches, a wooden bridge, and a towing-bridge over the Derwent, and three stone bridges across the Markeaton Brook, which flows through the town into the Derwent. Derby is lighted with gas, and supplied with water from the Derwent.

The principal manufactures are of silk and cotton goods, porcelain, jewellery, and ornamental articles made of the various kinds of spar found in the county, red and white lead, lead-pipe, sheet-lead, cast-iron, ribbed stockings, and bobbin-net and other lace.

Derby returns two members to parliament. It returned burgesses to parliament, 26 Edward I., and has continued to do so ever since. The assizes for the county are held at Derby, and also the Epiphany, Easter, and Michaelmas sessions; but the Midsummer sessions are held at Chesterfield. The Derwent was, several years since, made navigable from Derby to the Trent, but since the opening of the Derby Canal the navigation has been disused. The Derby Canal branches from the Trent and Mersey (or Grand Trunk) Canal at Swarkestone, a few miles south of Derby, runs northward, and intersects the Derwent at Derby, a towing-bridge being thrown across that river. From Derby the course of the canal is eastward until it joins the Erewash Canal at Sandiacre. Over the Markeaton Brook the canal is carried in a cast-iron trough or aqueduct. The Derby Canal is 44 feet wide at top and 24 feet wide at bottom, and 5 feet deep. Derby is supplied by this canal with coals, building-stone, gypsum, and other heavy materials.

There are several almshouses at Derby; a county infirmary; a self-supporting Charitable and Parochial Dispensary; a ladies' charity for the assistance of poor women during their confinement; and many friendly societies, or benefit clubs.

Derby contains numerous schools, including an ancient endowed grammar-school, two national schools, a Lancasterian school, and several Sunday schools. The town contains also a Philosophical Society (originally held at the house of Dr. Darwin), with a good library, a collection of fossils, and mathematical and philosophical apparatus; the Permanent Library, which has a public news-room and museum attached to it; and the Mechanics Institution, which has a handsome and spacious room for the meetings of the members. There is also a public arboretum near the town.

DERBYSHIRE, a midland county of England, bounded N.E. by Yorkshire, N.W. and W. by Cheshire, S.W. and W. by Staffordshire, S.E. by Leicestershire, and E. by Nottinghamshire. Its form is irregular; the greatest length from N. to S. is 56 miles; the greatest breadth from E. to W. is 34 miles. The area is 1028 square miles, or 657,920 acres. The population in 1841 was 272,217. There is a detached portion of the county near the southern extremity.

Surface, Hydrography, and Communications.—The southern and south-eastern parts have an easy ascent towards the north-western portion, which comprehends one of the most elevated and rugged districts in England. This part, which is

commonly known by the name of the Peak, is occupied by a part of the Penine chain which separates the waters which flow into the sea on the eastern side of the island from those on the west side. The Peak contains four summits above 1700 feet in height; viz. Lord's Seat, Axe Edge Hill, Blakelow Stones, and Kinderscout. This ridge divides the basin of the Mersey from that of the Trent; an offshoot from it divides the basin of the Derwent from that of the Dove; and another lateral ridge separates the basin of the Derwent from those of the Don and the Rother. These various highlands are intersected by narrow valleys and dales of great beauty. The broadest and deepest valleys are in the higher parts of the Peak. The faces of the rocks rise up almost perpendicularly from the sides of the valleys, as at Castleton and Stoney Middleton. Matlock High Tor, and other rocks in Matlock Dale, and the rocks which skirt some parts of the valley of the Dove, are of this precipitous character. In the smaller and narrower dales the projections of one side have corresponding recesses on the other.

The rivers of Derbyshire rise, for the most part, in the north-western and more elevated part of the county, and have a course toward the south or south-east; there are a few however which flow in other directions. The *Derwent* rises near the boundary of Yorkshire; it passes by Chatsworth, Matlock, Belper, and Derby, to its junction with the Trent about 12 miles S.E. of Derby; and it receives the rivers Westend, Ashop, Alport, Noe, and Wye. The current is rapid. The *Dove* rises on the border of Staffordshire and Derbyshire, in the slope of the Axe Edge Hill, and is, throughout its course, the boundary between the counties. It passes by way of Ashbourne to its junction with the Trent near Burton; and in its course of 45 miles it receives the Schoo, the Churnet, and several smaller streams. A portion of its valley, called Dove Dale, near Ashbourne, is one of the loveliest spots in England. The *Erewash* skirts a small portion of the S.E. of the county. The *Mease* flows through the detached fragment of the county. The *Trent* crosses Derbyshire in a direction nearly north-east, and has about 31 miles of its course within or upon the Derbyshire border, at its southern extremity. The Trent is navigable below its junction with the Derwent. The *Goyt*, the *Rother*, the *Etherow*, the *Dawley*, and the *Sheaf* are the chief remaining rivers of Derbyshire.

Derbyshire has several navigable canals. The Trent and Mersey Canal, begun in 1766, has part of its course in this county: it crosses the Dove by a fine aqueduct bridge. The Erewash Canal runs northward from the Trent to the Cromford Canal, about 11 miles. The Derby Canal runs from the Trent and Mersey Canal through Derby to the Erewash Canal. The Cromford Canal begins at Cromford, in the valley of the Derwent, runs by the side of that river to its junction with the Amber, and passes by Codnor to the valley of the Erewash; it has a tunnel a mile and a half long, and several aqueducts. The Nutbrook Canal connects the Shipley collieries with the Erewash Canal. The Chesterfield Canal, of 46 miles, has about 12 miles of its course in Derbyshire, from Chesterfield to the valley of the Rother.

Derbyshire has several railways. The Cromford and High Peak Railway, intended for mineral traffic, extends from Cromford past Wirksworth and Buxton to the Peak Forest Canal near Chapel-en-le-Frith. This is to be incorporated in a larger series of railways from Ambergate to Macclesfield, now (1848) in progress. A considerable portion of the Midland Railway, and smaller portions of the Manchester and Sheffield Railway and of the Churnet Valley Railway are to pass through the county.

Geology and Mineralogy.—That part of Derbyshire which lies south of a line drawn through Ashbourne, Duffield, and Sandiacre is almost entirely occupied by the red marl or new red sandstone. In many parts, and especially along the valleys of the lower Derwent and the Trent, the red marl is covered by beds of gravel. The strata of the red marl present considerable variety: among them are some micaceous gritstone beds, producing a good freestone; other strata are not concreted, but appear as sand, red, white, and yellow; others are more clayey, and from them bricks and tiles are made. Several deposits of gypsum are found in this formation. This gypsum is used for ornaments, for potters' moulds, and for plaster. The newer magnesian limestone extends into the eastern part of Derbyshire, where it occupies the part east of a line drawn north and south through Bolsover. The thickness of this formation is probably 300 feet. The general colour is yellow, of various shades, from a bright gamboge to a light straw colour or white. This limestone is quarried for building, also for flooring and staircases. The new Houses of Parliament are being built of Bolsover limestone. Towards the bottom of the series are several beds of compact blue limestone, imbedded in blue clay, and abounding with shells. This blue limestone yields excellent lime: it is quarried at Bolsover, where also pipe-clay is obtained: the pipe-clay separates the limestone beds.

The coal-measures underlie the magnesian limestone, and crop out from beneath it on the west. There are twenty gritstone-beds, some of them of great thickness, and numerous strata of slate-clay, as shale, bind, and clunch. A hard argillaceous rock called crowstone forms in some places the floor of the coal-beds. The number or order of the coal-seams is probably about thirty, varying in thickness from six inches to eleven feet. Every variety of coal seems to be found in this field, hard stone coal, cannel, peacock, and caking coal. The beds which lie between the seams of coal are worked for various purposes.

Millstone-grit and shale form a series of strata, having an aggregate thickness of about 870 feet. This series is met with in many parts of the county. The hills formed by it usually present a bold escarpment, crowned by rude piles of crags, exhibiting some of the wildest rock scenery of the district. Carboniferous or mountain limestone occurs largely in the northern part of the county. The limestone is divided into four beds by three intervening beds of toadstone. In each bed of

this limestone thin beds of clay are found, with imbedded masses of toadstone, and various organic remains. The white chert or china-stone, and the beautiful fluor spar called 'Blue John,' are met with in the limestone. The outcrop of this system forms the lead district of Derbyshire. Numerous veins have been worked in it, chiefly for lead; but ores of zinc, iron, manganese, and copper also occur. Lead ore is found occasionally in the toadstone which intervenes between the limestone beds, but commonly the veins are cut off by the toadstone-beds. The limestone is remarkable for the caverns which it contains: one of them, the Devil's Cave, penetrates to a distance of half a mile from its mouth; and Elden Hole, Peak's Hole, Pool's Hole, and the Bagshaw Grottos, also extend to a great distance.

The mineral springs of Derbyshire are numerous and important. The most celebrated are those of Buxton, Matlock, Stoney Middleton, and Kedleston Park.

Soil and Agriculture.— On the high hills and moors of Derbyshire the cultivation is not extended as it might be. In the valleys, or on the less abrupt hills, a very fertile red marly loam is frequently met with, which is suitable for every kind of grain without any extraordinary tillage. Clays and loams are more extensive than sandy soils in this county. The climate in the valleys differs little from that of the surrounding counties; but the hilly parts are very rainy.

The manner in which the soil is cultivated varies as much as its nature. Rich proprietors who have experienced bailiffs adopt all the new improvements, and their farms are well managed. There are also a few farmers who have some capital, and manage their land well; but the majority are small farmers, who follow the routine of their forefathers, and have not the means, if they had the inclination, to make permanent improvements. Many farms are so small that they are scarcely superior to cottage tenures, and the occupiers have other means of gaining a livelihood besides their land. The course of cultivation on the best loams is generally that which begins with a summer fallow manured with lime for wheat, and succeeded by spring corn with or without clover or grass seeds. Some farmers have adopted the improved convertible system. The wheat produced on the red land is good and heavy. On the poorer soils oats and barley are more certain and profitable crops. Potatoes are raised in considerable quantities, both in garden plots, and in the fields, where they are planted in rows and moulded up with the plough. A large proportion of the lands is in permanent pastures, of which some are very rich; and much good cheese is made. There are many productive meadows along the river valleys, and rich upland pastures mown for hay.

There are many woods and coppices scattered through the county. There being no great demand for fire-wood in a country abounding with coal, the coppices are allowed to grow for twenty or twenty-five years before they are cut, in order that the poles may acquire a considerable size, and be proper for supporting the roofs and sides of excavations in mines and coal-pits, or fit to make ladders of.

The horned cattle of Derbyshire have no peculiar character. The sheep on the hills are similar to those found on the Cheviot Hills; in the valleys the Leicester and South Down breeds, and various crosses, are generally preferred by the best farmers. The Derbyshire breed of horses is good.

Divisions, Towns, &c.—Derbyshire is divided into 6 hundreds, and about 140 parishes. It is in the diocese of Lichfield, and constitutes the archdeaconry of Derby. It is in the Midland Circuit. The assizes and quarter-sessions are held at Derby, except the April sessions, which are held at Chesterfield. For parliamentary purposes the county is formed into a north division and south division, each of which returns 2 members to parliament; in addition to which the borough of Derby returns 2 members. Derbyshire has some peculiar laws and regulations connected with the working of the lead-mines.

The following are the principal towns, with the population of each in 1841:—

Alfreton. [ALFRETON.]

Ashbourne, a market-town, is situated in a rich valley, not far from the east bank of the river Dove, 13 miles N.W. by W. from Derby. The church is ancient, and has a fine spire rising from a central tower. The chief trade of the town is in cheese and malt. Population, 2158.

Ashover is situated in a narrow valley watered by the river Amber, 6 miles S.S.W. from Chesterfield. It contains an ancient parish church. Population of the parish, which is extensive, and contains some considerable lead-mines, 3482.

Bakewell is a very ancient town, situated on the west bank of the Wye, 22 miles N.N.W. from Derby. The town contains a parish church, of which the nave is of Saxon architecture, but the other parts are of later date: the tower and spire have been taken down. The parish is very extensive, and contains many other townships besides Bakewell. Population of the entire parish, 10,363; of Bakewell, 1976.

Belper is on the east bank of the Derwent, 7½ miles N. from Derby, by the Derby and Sheffield Railway. The prosperity of Belper is of modern date, and is to be principally ascribed to the establishment of large cotton-works. It is now one of the most flourishing towns in Derbyshire. The older buildings form a very small part of the place, which consists chiefly of modern houses, with neat exteriors, while flower-gardens, orchards, and plantations are fast spreading over the rising grounds about the town. Gritstone, which the neighbourhood furnishes of excellent quality, is much used in building. The ancient chapel being too small for the increased population of the place, a new church has been erected on a bold elevation above the town, and from its situation and architecture, which is of the florid English style, is a great ornament to the place. The ancient chapel is used for evening lectures and for a school-room. There are places of worship for Unitarians, Independents, General and Particular Baptists, and Wesleyan and Primitive Methodists. There is a

stone bridge of three arches over the Derwent. Population of the chapelry of Belper, 9885.

Bolsover, a village, formerly a market-town, 23 miles N.N.W. from Derby, is pleasantly situated, together with the castle (which is a modern erection on the site of the ancient Bolsover Castle), on a point projecting into a valley which surrounds it on every side except the N.E., where a separation has been made by a deep cut. There is an ancient parish church. Population of the parish, 1512.

Buxton, a small market-town, is situated in a deep valley, on the west bank of the Wye, 33 miles N.N.W. from Derby, and is surrounded by bleak hills and extensive tracts of moorland. The old town occupies the highest ground, and has the remains of a cross in the centre of the market-place. The Crescent, in the new town, is an extensive and elegant structure, three stories high, of which the basement story has a piazza seven feet wide within. The Crescent, besides containing some of the baths, for which Buxton has been celebrated from the time of the Romans, comprises two hotels, a library, an assembly-room, a news-room, and a few private residences. It was erected in 1781 by the Duke of Devonshire, at a cost of 120,000*l.* The most ancient building in the lower part of Buxton is the Old Hall, which was erected in the reign of Queen Elizabeth, is fitted up as an hotel, and contains warm and shower-baths. The church is an elegant modern structure. The public baths at Buxton are numerous, and are hot, tepid, and cold. The hot spring has a temperature of 82° Fahr., which never varies. A gallon contains 10.4 grains of carbonate of lime, 2.4 grains of hydrochlorate of soda, 1.5 cubic inches of carbonic acid gas, and 4.64 cubic inches of nitrogen gas. There are accommodations for 1500 visitors at one time. The season commences in June, and ends in October. The environs of Buxton abound in natural curiosities, among the most interesting of which is the cavern called 'Pool's Hole.' Population of the chapelry, 1569.

Chapel-en-le-Frith is 5 miles N. from Buxton. The entire parish, which includes three townships, contains 3199 inhabitants, many of whom are employed in cotton and paper manufactures.

Chesterfield is a market-town and municipal borough, on the west bank of the Rother, 24¼ miles N. from Derby by the Derby and Sheffield Railway. There are iron-foundries, potteries, lace and silk manufactures, and collieries, in the town and neighbourhood. The borough is governed by 4 aldermen and 12 councillors. Population, 6212. The Chesterfield Canal extends from Chesterfield 46 miles to the tideway of the Trent.

Crich, a market-town between the rivers Amber and Derwent, 12 miles N. from Derby. The town is built on a considerable limestone hill that overlooks all the eminences round it. The church forms a very conspicuous object: it has a very tall spire. Population of the township, 2619.

Cromford is a market-town, on the west bank of the Derwent. It is in a deep valley, inclosed on the north, south, and west by lofty limestone rocks. Cromford owes its prosperity to the cotton manufacture. Population of the chapelry, 1407. Lead mines are worked in the neighbourhood, lapis calaminaris is ground and prepared, and red lead is manufactured. The Cromford Canal terminates here.

Dronfield is a market-town on the road between Chesterfield and Sheffield, 5½ miles N. by W. from Chesterfield. The parish church is beautifully situated on a hill on one side of the town. It has a fine tower and spire, chiefly in the decorated English style. There are some manufactures carried on at Dronfield, chiefly of iron goods, as cast iron chains and nails, axes, chisels and other edge tools, common cutlery, and agricultural implements. Population of the township, 1986.

Heanor, a market-town, about 9 miles N.N.E. from Derby, is well situated for trade, the Erewash Canal passing through the parish, and the neighbouring district having many coal-pits. There are manufactories for cotton goods, hosiery, and bobbin-net lace. Population of the township, 3058.

Ilkeston is 9 miles E.N.E. from Derby, in the valley of the Erewash. Population of the parish, 5326, a considerable portion of whom are engaged in manufactures or in the coal-pits in the neighbourhood. The church has a stone screen in the early English style of architecture. The principal manufactures are of stocking and lace. A warm mineral spring, the properties of which are said to resemble those of the Seltzer water, has been discovered, and has obtained some repute. The Erewash and the Nutbrook Canals both pass through the parish.

Matlock is on the east bank of the river Derwent, 18 miles N. by W. from Derby. The village of Matlock is ancient, and chiefly inhabited by the persons employed in the neighbouring lead-mines and in the cotton manufacture. Matlock baths are nearly a mile and a half distant from the village, nearer to Derby, and are much resorted to by visitors, as much for the beauty of the situation as for the baths. There is a bridge over the Derwent at Matlock village. The church is a small edifice in the later English style of architecture. Population of the parish, 3782. Matlock village and baths are in a dale which extends for two miles north and south, bounded on each side by steep rocks, whose naked sides rise to the height of nearly 300 *feet*. Through this dale the Derwent flows, and its banks are lined with trees, except where the rocks approach, and rise almost perpendicularly from the water. The Matlock waters have a temperature of about 68° Fahr. They are considered to resemble the Bristol waters, and are recommended in bilious disorders, diabetes, and similar complaints of the digestive organs.

Tideswell is about 35 miles N.N.W. from Derby. It is a small market-town situated in a bottom amid bleak naked hills. The church is a fine building, built about the middle of the fourteenth century, and principally in the decorated English style. There is a free grammar-school, which educates about 70 boys. Population of the township, 1777.

Winster, a market-town, is 24 miles N.N.W. from Derby. This little town runs along the side of a steep eminence. The houses are built of limestone, and are partly thatched and partly

covered with stone: they are intermingled with orchards and gardens. The church is small; it has preserved some features of Norman architecture, but it has been much altered. Population of the chapelry, 1005.

Wirksworth, 13 miles N.N.W. from Derby, and 3 miles S. by W. from Matlock, is situated near the southern edge of the mining district, and is an ancient seat of the lead trade. Roman coins and relics have been found there. The church is a handsome Gothic structure of the fourteenth century. The ancient miners' courts, called Barmote Courts, are held at Wirksworth in a handsome stone building erected in 1814 at the expense of the duchy of Lancaster. Population, 4122.

History and Antiquities.—Before the Roman conquest Derbyshire appears to have been included in the territory of the Coritani: after that event it was included in the province of Flavia Cæsariensis. Many of the large single stones met with in the county, due wholly to geological causes, have been sometimes viewed as Druidical remains; but there are circles of stones, such as that at Arbelows near Winster, and tumuli or barrows of earth, which are doubtless memorials of the early inhabitants.

There are many roads and stations in the county which are believed to be of Roman formation. Such are the Roman road which coincides in part with the still earlier Rykneld Street, a road from Brough to Buxton, two other roads diverging from Buxton, another from Rocester into Nottinghamshire, another the 'Doctor's Gate,' from Brough to Glossop, and the Roman stations and camps at Chesterfield, Brough, Buxton, Little Chester, Rocester, Glossop, Castleton, and Combe Moss. An altar, some pigs of lead, and some coins have been met with belonging to Roman times.

In the Saxon division of England, Derbyshire was comprehended in the kingdom of Mercia. In the great invasion of England by the Danes in the time of Ethelred I. and Alfred, Derbyshire was overrun by them, and in the wars which Alfred and his successors maintained against them this county was frequently the scene of contest. At the Norman conquest considerable grants of land within the county were made to Henry de Ferrers, whose descendants became Earls of Derby. William Peverel, a natural son of the Conqueror, received also considerable grants. He built the castle of the Peak; and he, or his son, is supposed to have built the original Bolsover Castle. From that time till the reign of Henry VII. nearly all the political events in which Derbyshire took part arose out of measures which the powerful Earls of Derby took either for or against the reigning sovereign. The earldom was in royal possession from the time of Henry III. to Henry VII., when it was conferred upon Lord Stanley, whose descendants have ever since held it. Derbyshire contains various relics of the middle ages, baronial, ecclesiastical, and monastic. Besides the Peak Castle, there are some remains of Codnor Castle, near Heanor. Haddon Hall, the seat of the Duke of Rutland, is on the north-east or left bank of the Wye, below Bakewell; it consists of two courts of irregular form, approaching to squares, surrounded by suites of apartments, and was evidently designed to have a domestic, not a military character. Hardwick Hall is a curious specimen of the style of domestic architecture in Elizabeth's reign, and has remained unaltered since the time of its erection. South Winfield manor-house, near Alfreton, was built in the reign of Henry VI., and ruined in the civil wars of Charles I.: the remains present some beautiful features. Some of the most remarkable churches in Derbyshire are those of Repton, Melbourne, Streetly, Derby, Ashbourne, Bakewell, Chesterfield, and Dronfield. The monastic establishments of Derbyshire were neither large nor wealthy. There are very few remains of them. They comprise fragments of Repton Priory, the Chapel of St. John of Jerusalem at Yeaveley, Dale Abbey, and Beauchief Abbey.

The principal historical events connected with Derbyshire, since the Reformation, occurred during the civil war of Charles I. The county at first declared for the king, who, after setting up his standard at Nottingham, marched to Derby; but it was soon brought over to the side of the parliament; and during 1642 and the three following years many contests occurred within the county between the opposing parties. The young Pretender advanced to Derby in 1745.

DEREHAM, EAST. [Norfolk.]

DERG, LOUGH. [Donegal.]

DERHAM, the Rev. WILLIAM, D.D., an eminent English divine and philosopher, was born at Stowton, near Worcester, in November 1657, and received his early education at Blockley in the same county. He was admitted of Trinity College, Oxford, in 1675. Having completed his academic studies, he was ordained, and in 1685 was instituted in the vicarage of Wargrave in Berkshire; and four years afterwards to the valuable rectory of Upminster in Essex, where he spent the remainder of his life. He was made canon of Windsor in 1716, and in 1730 he received from his university the diploma of D.D.

His first publication was the 'Artificial Clock-Maker,' which has gone through three or four editions, and is considered a useful manual even now. In 1711, 1712, and 1714, he preached those sermons at Boyle's Lecture which he afterwards expanded into the well-known works 'Physico-Theology' and 'Astro-Theology,' or a demonstration of the being and attributes of God from the works of creation and a survey of the heavens, enriched with valuable notes, and good engravings. His next separate work was 'Christo-Theology,' or a demonstration of the divine authority of the Christian religion, being the substance of a sermon preached in the Abbey Church of Bath, in 1729; and he published in the name of Everard Fleetwood, 'A Defence of the Church's Right in Leasehold Estates.'

Dr. Derham published some of the works of the naturalist Ray, of which he had procured the MSS., and to him the world is indebted for the publication of the philosophical experiments of Dr. Hook. He also gave new editions of other of Ray's works, with valuable additions, original, and from the author's manuscripts, besides editing

other works of value, amongst which was the 'Miscellanea Curiosa,' in 3 vols. small 8vo., a work of value even at this time.

He was elected a Fellow of the Royal Society in 1702; and a considerable number of his papers were printed in the 'Philosophical Transactions,' from the 20th to the 39th volume inclusive.

Dr. Derham was of small stature and distorted form. He was not only the moral and religious benefactor of his parishioners, and of all those who came in his way, but he was likewise the physician of their bodies, and their pecuniary friend in all their difficulties. He lived beloved, and died lamented, at his rectory, in 1735, aged seventy-eight.

DERMATINE occurs in reniform masses, rarely globular, and in thin coatings or crusts. Colour, dark olive green or liver brown. Hardness, about 2.0. Specific gravity, 2.136. Found in the serpentine quarry near Waldheim in Saxony. Silica, 35.800; magnesia, 23.700; protoxide of iron, 11.333; protoxide of manganese, 2.250; alumina, 0.416; lime, 0.833; water and carbonic acid, 25.200.

DERMATOBRANCHUS, a genus of Mollusks, established by M. Van-Hasselt and arranged by him among the *Nudibranchiata*. M. de Blainville thinks that its appropriate place is by the side of the *Scyllæa*. M. Rang in his Manual, uncertain of its position, consigns it to the 'Genres non classés' at the end of his book.

Generic Character.—Animal depressed, semicircular, provided with an exceedingly large foot, and protected above by an enlarged mantle, rounded anteriorly, narrowed posteriorly, beset with elongated striæ or pustules, which are branchial. A pair of short, approximated, contractile tentacula situated between the head and the mantle. Eyes none? *Three* apertures on the right side of the body, the anterior opening near the head for the generative apparatus, the second for the vent, and the third for the urinary organ. Locality, Coast of Java.

DERME'STIDÆ (from δερμηστής), a moth or worm that eats skins), a tribe of pentamerous coleopterous insects, belonging to the family of *Clavicornes*. It includes the genera *Aspidiphorus*, *Dermestes*, *Megatoma*, *Attagenus*, *Nogoderma*, *Anthrenus*, and *Globulicorne*. The species of the typical genus, *Dermestes*, are harmless insects in their perfect state, living on flowers; but whilst in the condition of larvæ they are most destructive creatures, and great pests to the naturalist from the mischief they do among his collections, more especially of skins. They are distributed through Europe, New Holland, Africa, and America.

DERRICK, SAMUEL, whose name occupies an obscure place in the literature of the 18th century, was a native of Ireland, and born in 1724. He was first a linen-draper in Dublin, but about 1748 became professionally an author in London, and soon afterwards appeared unsuccessfully as an actor. A life of irregularity and debauchery introduced him to some fashionable acquaintances, whose influence procured his appointment to succeed Beau Nash as master of the ceremonies at Bath and Tunbridge. His extravagant habits remained with him there, and he died very poor, in March 1769. His avowed literary works are of little importance.

DERRY, a bishop's see in the archdiocese of Armagh in Ireland, is now united with Raphoe. The diocese includes parts of Londonderry, Donegal, and Tyrone, and a small part of Antrim. [BISHOPRIC.]

DERWENT. [CUMBERLAND; DERBYSHIRE.]

DERWISH is a Persian word, properly an adjective, which signifies poor, indigent. As a substantive it is used to denote a religious mendicant, hermit, or any one who retires from social life in order to devote himself entirely to religious contemplation. It is synonymous with the Arabic *Fakir*, and both expressions are chiefly employed to designate a class of persons in Mohammedan countries nearly corresponding to the different orders of monks among the Christians.

DERZHAVIN, GABRIEL ROMANOVITCH, the greatest lyric poet Russia has yet produced, was born at Kasan, July 3, 1743. He entered the army in 1760, in the engineer service, and became lieutenant in 1774, but quitted the army in 1784, on being appointed a counsellor of state, and afterwards governor of Olonetz and of Tambov successively. In 1791, Catherine bestowed on him the office of secretary of state, and he continued to rise in the civil service till 1802, when he retired from the office of minister of justice on a full pension. This he lived to enjoy for a considerable period, as he did not die until 1816.

Such a career, both military and official, by no means an unusual one with the literary men of Russia, however uncongenial it may appear to us, did not prevent his cultivating the Muses during some of the most busy portions of his life; for the finest of his odes were produced at that period. Pre-eminent among these is his 'Oda Bog' or 'Address to the Deity,' a piece full of sublimity both as regards the ideas and expressions. Indeed, elevation of conception and nobleness of sentiment, no less than great energy and mastery of language, are striking characteristics of Derzhavin's poetry. In the art of which he was so profound a master, he has shown himself no less able as a critic by his treatise on Lyric Poetry. Besides the essay just mentioned, he wrote some other works in prose, among which is a 'Topographical Description of the Government of Tambov.' A collection of his works was first printed in 1810, in four volumes; to which was added another, shortly before his death.

DESAGUADERO. [BOLIVIA.]

DESAGULIERS, JEAN THE'OPHILE, D.D., was brought to England while an infant by his father Jean Desaguliers, a French Protestant minister, who, after the Revocation of the Edict of Nantes, fled to England, and was employed as a teacher in a school at Islington, near London.

Jean Théophile Desaguliers was born at Rochelle, on the 12th of March, 1683. His early education he owed to the instruction of his father, who appears to have been a very respectable scholar and sound divine, and at an early age he was sent to Christ Church, Oxford. In

1702, being then only nineteen, he succeeded Dr. Keil in reading lectures on Experimental Philosophy at Hart Hall. Upon his marriage in 1712, he settled in London, where he was the first who introduced the reading of lectures to the public on natural and experimental philosophy. This he did with great reputation to the end of his life, which terminated in 1749, in the sixty-sixth year of his age.

In 1714 Desaguliers was elected a Fellow of the Royal Society, of which he proved a valuable member. The Duke of Chandos appointed him his chaplain, and presented him with the living of Edgware, near his seat at Cannons; and he was afterwards made chaplain to the Prince of Wales.

From some causes which are not well understood, he appears to have fallen into a state of destitution; yet one of his sons, who died in 1775, was a colonel in the Royal Artillery, and a great favourite with George III.

The mind of Desaguliers was more fitted for the popular and the practical than for the profounder inquiries into experimental philosophy; and for the geometrical method of investigation than for the higher and then new calculus which has since so completely changed the whole current of research. His works are:—1. A Course of Lectures on Experimental Philosophy, 2 vols. 4to., 1734. 2. An edition of Dr. David Gregory's Elements of Catoptrics and Dioptrics, with an Appendix on Reflecting Telescopes, 8vo., 1735. 3. A Translation of the curious, valuable, and little known Treatise on Perspective, by S'Gravesande, 8vo. 4. A Translation of S'Gravesande's Natural Philosophy, 2 vols. 4to., 1747. 5. A Translation of Nieuwentyt's Religious Philosopher, 3 vols. 8vo. Several respectable papers by Desaguliers on Electricity are inserted in the Philosophical Transactions from 1714 to 1743.

DESCANT, in music, a term now fallen into disuse, which was synonymous with Counterpoint.

DESCARTES, RENE', was born at La Haye, in Touraine, on the 31st of March, 1596, and died at Stockholm on the 11th of February, 1650.

Descartes was of noble descent, being a younger son of a councillor in the parliament of Rennes. He is one of the many instances of great delicacy of constitution being combined with the highest order of mind. His early education was among the Jesuits.

During his course in the college of La Flèche he contracted a friendship with Mersenne, which continued to the end of the life of that distinguished monk; and this circumstance doubtless tended much to increase the attachment of Descartes to mathematical and metaphysical studies. The comparative novelty of the algebraic methods would give a charm to the study in a mind constituted like that of Descartes; and an examination of its first principles, and the operations of the mind in the actual development of the truths of geometry, would be more likely to arrest his active mind than the mere deduction of curious but necessary consequences. He formed the determination of renouncing all books, and endeavouring to efface from his mind the knowledge which he had been taught, so as to only employ the power which he had gained by the discipline of his college to investigate the fundamental principles of human knowledge *ab initio*.

Descartes wisely abstained from publishing his views at this time, or indeed his mathematical discoveries, of which there is some probability that he was in possession at this early age; but, conformably with the fashion of the age among men of his social and political condition, he engaged in the profession of arms. He served first as a volunteer in the army of Holland, and then in that of the Duke of Bavaria; and he was present at the battle of Prague in 1620, in which he conducted himself with great intrepidity. But even during his attachment to the camp he did not neglect his mathematical and philosophical inquiries. It is believed to have been during his stay at Breda that Descartes composed his 'Compendium Musicæ,' although it was not printed till after his death. Another circumstance indicative of his devotion to geometry is also narrated in connection with the same campaign, and occurring also at Breda. One day, seeing a group of people surrounding a placard, he found it written in Flemish, a language which he did not understand, and therefore applied to one of the bystanders for an explanation. This person chanced to be Beckmann, principal of the college of Dort, who, wondering that a young soldier should take any interest in geometry—the placard being, in keeping with the practice of the age, a problem proposed as a challenge—explained the problem to him, but is said to have displayed something of the collegiate pedantry which was then so common. Descartes however promised him a solution, which he sent early next morning.

He visited in succession Holland, France, Italy, and Switzerland, and stayed some time in Venice and Rome. It has often created surprise, that while in Italy he did not visit Galileo; and the cause which has been usually assigned was his jealousy of the fame of that father of physics, an assumption which there is reason to fear is too well founded. His repulsive conduct towards Fermat, whose overtures of an amicable correspondence he so long rejected with an appearance of disdain, seems also to intimate the wish of Descartes to reign alone in the circle of his associates, and in the philosophic world altogether.

After completing his travels, Descartes determined to devote his attention exclusively to philosophical and mathematical inquiries; and his ambition was to renovate the whole circle of the sciences. He sold a portion of his patrimony in France, and retired to Holland, where he imagined he should be more free to follow his inclination without the interruptions to which his celebrity in his own country rendered him perpetually liable. His writings however involved him in much controversy; and the vivacity and dogmatism of his temper often led him to treat in a somewhat supercilious manner the greatest men amongst his contemporaries. The personal courage of Descartes was great; and, unlike many valiant writers, he was valiant in the most trying dangers.

The fame of Descartes was very great, even in his lifetime: and that not only among the learned, but in the highest circles of society in every part of Europe. When, therefore, the church rose in arms against the heresy of his philosophy, and he was subjected to much persecution and some danger, he accepted the invitation of Christina, queen of Sweden, who offered him an asylum and complete protection from the bigoted hostility of his enemies. He was treated by the queen with the greatest distinction, and was released from the observance of any of the humiliating usages so generally exacted by sovereigns of those times from all whom they admitted into their presence. The queen however, probably from the love of differing from every one else, chose to pursue her studies with Descartes at five o'clock in the morning; and as his health was always far from robust, and now peculiarly delicate, the rigour of the climate, and the unseasonable hour, which formed such a striking contrast with those to which he had been many years habituated, brought on pulmonary disease, of which he very soon expired, in the fifty-fourth year of his age. The queen wished to inter him with great honour in Sweden: but the French ambassador interposed, and his remains were conveyed for sepulture amongst his countrymen in Paris. Thus fell one of the greatest men of his age, a victim to the absurd caprice of the royal patron under whose auspices he had taken shelter from the persecutions of the church.

Probably there is scarcely a name on record the bearer of which has given a greater impulse to mathematical and philosophical inquiry than Descartes. As a mathematician he actually published but little; and yet in every subject which he treated he has opened a new field of investigation.

His speculations in physics have often been ridiculed by subsequent writers. Many reasons may be urged in mitigation of that ridicule. It ought especially to be observed that the theories of all his predecessors were mere empirical conjectures respecting the places and paths of the celestial bodies. Those paths were not deduced as the necessary effect of any given *law of force*, but as the result of some fixed and unalterable system of machinery invisible to us, and directly under either the control of original accident or the original will of God. Innumerable hypotheses of the nature of this machinery had been framed before the time of Descartes; and he, being dissatisfied with all others, adopted that of an ethereal fluid, which was continually revolving round a centre, like the water in a vortex. We have indeed been too much in the habit of measuring the philosophical sanity of Descartes by the knowledge of our own times—a most unjust test to be applied to the intellectual efforts of any man by his successors. He was the first who brought optical science under the command of mathematics, by the discovery of the law of the refraction of the ordinary ray through diaphanous bodies. He determined the law itself, but not as the result of any law of force. This was a later discovery: but Descartes led the way.

His inquiries in the positive philosophy were distinguished by great acuteness and subtlety; and, though his theory has not in a direct form obtained many advocates in this country, it has in reality been the foundation of most of the sects which have since risen in every part of Europe. Differing as these systems do so very widely at first sight, this may be considered a paradoxical assertion. It is nevertheless the fact.

DESCENT (from *discent*, Norman French) is the rule of law pursuant to which, on the death of the owner of an estate of inheritance who has made no disposition thereof, it descends to another as heir. Inheritance is sometimes used in the same sense as descent, though it rather signifies that which is, or may be, inherited, or taken by descent. (Littleton, sect. 9.)

The law with respect to descents which have taken place since or shall take place after the 1st of January, 1834, is now regulated by the Act 3 & 4 Wm. IV. c. 106.

All modes of acquiring property in land by the English law are either Descent or Purchase. Descent, or hereditary succession, signifies the title by which a man acquires an estate in land as the heir-at-law of a person deceased. In his lifetime there can be no descent, and therefore no heir, though there may be an 'heir apparent,' or 'heir presumptive.' An heir apparent is he who must be the heir, if he lives till the inheritance descends; an heir presumptive is he who may be forestalled by the birth of a nearer heir.

Inheritances, otherwise called *hereditaments*, things which may be *inherited* or *taken by descent*, are various. The principal of these is the Crown, or royal title of the king of the British Empire. Dignities and honours, as baronies and other peerages, are descendible, according to the limitations contained in the patents by which they were created. If created by summons in the first instance, they are called dignities in fee, and are descendible to females. [BARONY.] Finally, all the objects of real property, and all annuities, offices, and whatever other things may be 'held in fee,' are 'descendible,' whether they are in possession, reversion, remainder, or expectancy. So are all rights and titles to things that may be held in fee, and the expectancy of an heir apparent or presumptive. There are also 'descendible freeholds,' that is, estates created by leases for lives, which, though not estates in fee, may during their continuance be inherited as if they were. Chattels are not generally the object of descent, but some are.

Upon the death of the owner, the inheritance devolves upon the heir. The heir was not subject formerly to the same extent as now to the charges and debts of the deceased tenant, in respect of the property that descended to him. [ASSETS.] The heir of an inheritance must now be always the heir of the last 'purchaser' of it, that is, of the last person who acquired the property 'otherwise than by descent, or than by an escheat, partition, or inclosure, by the effect of which the land shall have become part of, or descendible in the same manner as other land acquired by descent.'

As to descents in fee simple, the fundamental

rule is, that any person of *kin* to another, that is, descended from the same ancestor, may be his heir. If the son inherits to the father, his mother cannot succeed to him, for, though she may be heir to the son, she cannot be heir to the father, from whom, and not from the son, 'the descent is to be traced.' On the other hand, if the father inherits to the son, the mother may succeed to him, for, though she cannot be the heir of the father, she may be the heir of the son.

According to the old rules of law, if the child of the purchaser inherited to him, and became seised, the purchaser's child by another wife could not succeed to such child who had become heir, because he was only half-brother to the person last seised; and, if the father's brother inherited to the son and became seised, the mother's brother could not succeed, because only related by marriage to the person last seised. The new act admits among the heirs of the purchaser all his kindred, both of the whole and the half blood, and notwithstanding any previous descent to any heir of his. This it does by enacting that every lineal ancestor shall be capable of being heir to any of his issue (s. 6); that any person related to the purchaser by the half blood shall be capable of being his heir (s. 9), and that in every case descent shall be traced from the purchaser (s. 2). But the wife or her kin cannot inherit to the husband, nor the husband or his kin to the wife. The practical difficulty in finding who is heir is not the difficulty of understanding the law, but in ascertaining the facts upon which the law operates. The new act declares that the last owner of the land shall be presumed to be the purchaser, unless it can be proved that he is not; and this rule diminishes the difficulty of tracing the descent.

The rule of descent, which makes the eldest son, brother, &c. sole heir, exclusive of the other children, or the other nephews and nieces, &c., is known by the name of 'the law of primogeniture.' The customs of Borough English and Gavelkind are exceptions to this rule.

The descent of estates tail (regulated by Stat. 3 Ed. I. c. 1) differs from that of fees simple principally in this, that only the descendants of the first donee can inherit; and of these only males claiming exclusively through males can be heirs when the estate is in 'tail male:' when it is in tail female (a mode of gift which is quite obsolete), only females claiming exclusively through females. The limited descent of the estates, together with other qualities of them, makes them the best representative at present existing (excepting indeed copyholds) of the ancient fiefs.

(On the law of descent, as it existed before the late act, see Sir Matthew Hale's *History of the Common Law*, chap. xi.; 2 Blackstone, *Com.*, chap. xiv.; Cruise's *Digest*, vol. iii.; Watkins *On Descents*. As to the reasons for the late alterations, see *First Report of the Real Property Commissioners*.)

DESERTER, an officer or soldier who either, in time of peace or war, abandons the regiment, battalion, or corps to which he belongs, without having obtained leave, and with the intention not to return.

The word deserter is from the Roman *Desertor*, which had various meanings. A soldier who did not give in his name (dare nomen) when duly summoned to service might be treated as a Desertor. (Liv., iii. 69.) The soldier who fled in battle and left the standard was called Desertor, and the punishment was death. He who went over to the enemy was transfuga or perfuga, and was always put to death. Under the Empire there were various classifications of desertion with their several punishments. ('Dig.' 49, tit. 16, 'De Re Militari.')

The civil courts of law in this country have ever had authority to try offenders accused of desertion; but they have long since ceased to exercise such authority, and they now interfere only in the rare case of an appeal from the decision of the court-martial which is held for the purpose of investigating the charge and awarding the punishment. The courts-martial exercise, to a certain extent, a discretionary power in proportioning the punishments to the criminality in the accused; and the leniency which has invariably characterised the sentences of courts-martial, with the custom of not awarding the punishment in its full extent till after a repetition of the crime, sufficiently justifies the confidence reposed in those courts.

The practice of deserting from one regiment or corps, and of enlisting in another, either from caprice or for the sake of a bounty, having been very frequent, a particular clause has been inserted in the Articles of War in order to prevent this abuse. It declares that any non-commissioned officer or soldier so acting shall be considered as a deserter, and punished accordingly; and that any officer who knowingly enlists such offender shall be cashiered. Any officer or soldier who may advise or encourage another to desert is also punishable by a general court-martial.

Absconding from a recruiting party within four days after having received the enlisting money is also considered as desertion; and an apprentice who enlists, representing himself as free, if he afterwards quits the corps, is esteemed a deserter unless he deliver himself up at the expiration of his apprenticeship. Vagrants also, who, pretending to be deserters, give themselves up as such with a view of obtaining money or provisions, are, by a clause of the Mutiny Act, to be considered as soldiers whether enlisted or not.

A non-commissioned officer or soldier who simply absents himself from his corps without leave is exonerated from the graver part of the charge, if any circumstances can be adduced from which it may be inferred that the absence was intended to be only for a short time. Simple absence without leave is referred to regimental courts-martial merely, and these award the punishment discretionally.

The Mutiny Act authorises general courts-martial to condemn a culprit to death, if his crime should be found to deserve the extreme punishment; in other cases they may sentence him to be transported as a felon, either for life or for a term of years, or to serve in the ranks for life, or for a

length of time exceeding that for which he had originally engaged to serve. In some cases, also, corporal punishment is awarded, and an offender may be sentenced to lose the increased pay or the pension to which he would have been entitled if the guilt had not been incurred.

Desertion is justly considered one of the greatest offences that can be committed by any man who has adopted the profession of arms. Whether he withdraw through caprice, or to escape the privations to which the soldier is occasionally exposed, he sets an example of discipline infringed, he deprives the army of his services at a time perhaps when he can with difficulty be replaced, and, while he basely seeks his own ease, he throws an additional burthen upon his companions in arms.

DESERTS, a general name for sandy and stony places, with little fertility and few inhabitants. The chief large deserts are the following:—

North Africa, from its western coast to the border of the Red Sea, presents one vast sea of sand, occupying upon an average about 48 degrees of longitude and 10 of latitude, which is but partially interrupted by a projecting part of Fezzan and by the narrow valley of the Nile. It is divided into the *Sahara* and the *Libyan Desert*. The Sahara is covered with moving sands formed into ridges like the waves of the sea. In the midst of these sands, whose position and aspect are continually changing by the effect of the wind, are dispersed a few rocky hills, and small hollows where the collected waters nourish a few shrubs, ferns, and grasses. The mountains which bound the desert on the west present insulated pinnacles, descending gradually into a plain covered with white and sharp silicious stones, and which is at last confounded with the sands. The scarcity of water, and the parching wind called the Samiel, are the two most terrible scourges of this desert. The Libyan Desert is very similar in its character to the Sahara; it joins the equally sterile region of northern Nubia; leaving which, and crossing the Nile, we again meet with sandy and rocky tracts, which, from Abyssinia on the south as far as Suez on the north, occupy the whole space between the river and the Red Sea.

Passing from Africa to Arabia, we first meet with the sandy hills which form the Isthmus of Suez, and separate the Arabian Gulf from the Mediterranean, whose coast-line they follow as far as Palestine. Immediately to the south of these sands extends the stony and barren tract known by the name of Arabia Petræa, and containing Mount Sinai. The south-east of Arabia is almost one vast desert; and so is the eastern portion of Syria. Beyond the Euphrates, Mesopotamia is, with the exception of narrow tracts along the rivers, a desert still more horrible than those of Africa and Arabia; it is covered with burning sands and sterile gypsum. Wormwood and certain aromatic shrubs are the only vegetation, which, covering immense spaces, banish all other plants. The waters of this desert, mostly all saline or sulphurous, give rise to pestilential miasmata.

In Persia there are five principal deserts, which occupy about three-tenths of the surface of the country. They are the deserts of Carmania, Kiab, Meckran, Karakoum, and the great salt desert which separates Irak-Ajemi from Khorassan. Northward of Persian is Independent Tartary, which may be regarded as the north-western declivity of the great central plateau of Asia. It occupies a surface of about 60,000 square leagues, of which the greater half is a desert; for, with the exception of the immediate foot of the mountains and the water-courses, the whole country is condemned to drought and sterility. Afghanistan is a vast sandy basin, except in the immediate vicinity of the mountains by which it is bounded on the east and north, and along the banks of the rivers. It may almost be said that there is a continued desert from the West Coast of Africa to the Indus, covering an area which Humboldt estimates at 300,000 square leagues.

The great central table-land of Asia is very little better than a desert. The whole of the centre and eastern portion of Little Bucharia is a sandy and salt desert. Mongolia contains the vast desert of Shamo, 500 leagues in length. The area of these Tartarian deserts is estimated at 100,000 square leagues, which, together with the former 300,000 and about 100,000 more for the sandy tracts in the south of Africa, and in Europe, gives a total of half a million of square leagues of sandy desert in the old world alone; that is, a surface equal to the whole of Europe. The less sandy levels known by the names of *plains*, *pampas*, *savannahs*, and *steppes*, are described under PLAINS.

DESHOULIE'RES, MADAME, a French poetess, was born in 1633, and died in 1694. Her maiden name was *Antoinette du Ligier de la Garde*. She wrote a number of poems, chiefly pastoral; 'Idyls' they were called; one of which, 'Les Oiseaux,' La Harpe in his 'Cours de la Littérature,' praises very highly, but few of the others rise above mediocrity. She also wrote a tragedy, which Racine parodied, in revenge for some satirical verses she had written upon his 'Phædra.'

DESICCATION is the chemical operation of drying bodies. It is sometimes effected by simple drying in the air; sometimes in warm chambers; at others, by paper filters, by the air-pump, by the action of deliquescent salts placed near the body to be dried, and by many other modes.

DESIGN. In the fine arts the word design (from the Italian *disegnare*, to draw) is employed in two very different significations: in the first place, it is used merely to signify the act of drawing, or representing in lines the form of any object; in the next place, it expresses that combination of invention and purpose which enables the artist to compose a picture or a group, without reference to the material in which it is executed. The accurate conception of form and beauty is displayed in the most masterly degree in the ancient Greek sculptures; and in the invention of appropriate attitudes and perfection of physical form the design of the best Greek sculptors cannot be surpassed. But, of all the existing specimens of art, the paintings of the Italian masters display

the most consummate excellence in design, especially the Florentine and Roman schools, and among them Raphael's in particular.

The student in design may discover the means by which former artists attained their power, by copying and analysing their works, namely, the sculptures of Greece, and the works of the old masters. The legitimate object of study, or that part of study which seeks to shorten the process of education, is to discover the mode which other artists have pursued in disciplining their minds, and eyes, and hands, in order to comprehend and express the nature which they had to portray. In this way the student learns, not to pilfer the works of others, but to turn to the best account his own ability and industry, to produce originals instead of mere copies. The study of the best poets, of histories, and the lives of individuals, of emotions casually displayed in the events of daily life, and in fact every thing that helps to teach a knowledge of human nature, and the working of its internal feelings, combined with an accurate knowledge of those external forms which must enter into every composition, will conduce to the development of a power of original design.

DESIGN, ARCHITECTURAL. The scheme, idea, or, as it is more usually termed, the design, whether for an intended building or that of one already erected, is shown by means of a series of diagrams or drawings, which, taken one with another, convey a much more exact and complete notion of the whole, both internally and externally, than can be obtained by any other mode of delineation. Such drawings consist of *plan*, *elevation*, and *section*, besides others of *details*, or *parts at large*; and their number will depend, either upon the nature of the building, that is, on its being more or less complex, or as it is intended to show it more or less fully.

Although a certain prejudice exists against such drawings, on the score of their being too technical and difficult, they become, when once explained, intelligible enough to any person of common capacity, however ignorant he may be of architecture. To begin with the *plan*, (the *plant*, or *plot*, as it is sometimes termed by old writers), as the first in natural order, it being that which must be determined upon before the walls can be raised,—it may no less briefly than clearly be described as the map of the building; consequently, any one who understands geographical or topographical plans of that kind can be at no loss to comprehend the nature of an architectural one, the latter being a far more exact and less arbitrary and conventional representation than the other class. By means of the plan we distinguish most clearly the exact shape and extent of the building as regards the space on which it stands; the thickness of the walls, the internal arrangement, with the forms, number, and areas of the rooms and passages into which it is divided; and the situation and width of the doors, windows, fire-places, staircases, &c.; the solid and raised parts, such as walls, columns, piers, &c., being shaded, and the voids or apertures in the walls, such as doors and windows, being left white.

Another species of plan is that termed a *block-plan*, namely, a map displaying the general mass of the building, together with its locality, either in regard to other edifices or not, as the case may be; and such plans are an exceedingly useful accompaniment to others, because they serve to make us acquainted not only with the structure itself, but with its situation. From a ground-plan alone, for instance, of St. Paul's, all that could be learnt in respect to the last-mentioned circumstance is, that it is insulated, whereas a block-plan would show the precise form and extent of the surrounding area; how confined and irregular it is, and how far it would be necessary to set back the houses in some places in order to reduce the whole to uniformity. Plans of this kind are, in fact, *special* maps laid down upon a larger scale, and therefore more exact and detailed, although less comprehensive than ordinary ones.

An *elevation* (formerly termed an 'upright,' in Italian *alzata*, in German *aufriss*) may be described as a vertical plan, showing the front or one external face of the building as raised upon the plan; it therefore gives the precise forms and measurements of every part, delineated geometrically according to scale, and not as they appear according to distance or the accidents of perspective, whether depending on the level at which the eye is placed, or as the building happens to be viewed parallelly, or more or less obliquely.

It is not always that sufficient allowance is made, even by architects themselves, for the great difference which sometimes occurs between an elevation and the building itself; or that the real effect is duly considered beforehand. Recourse is therefore occasionally had to what is termed a *perspective elevation*—a kind of conventional representation, partly geometrical, partly perspective, and combining in some degree the advantage of both modes, although strictly neither of them.

Sections are for the interior what elevations are for the exterior of a building. A section or profile (in French *coupe*, Italian *spaccato*, German *durchschnitt*) is a plane cutting through the structure on some line of its plan, and showing the thickness of the walls and floors, the heights of the rooms, the forms and profiles of ceilings, whether plain or decorated, flat, coved, or arched; also the exact forms of domes and skylights. In fact it exhibits all the separate elevations of the rooms intersected by such plane, that is, the elevation of that side of them which faces or lies behind the plane of representation. In addition to the particulars just enumerated, we are by this means made acquainted with a variety of others, in regard to which a plan cannot be made to afford any information.

Although not in general use, there are likewise many other modes and combinations which deserve to be pointed out. One of them is that of elevation and section united.

Besides the usual plans, elevations, and sections, there must likewise be *details* or *parts at large*, answering in some respect to what are termed working drawings; since without these we can judge only of the general design, but not of its minutiæ and finishing, whether belonging to decoration or construction: and far more may

be learned, and that too more satisfactorily, by studying a single good example thoroughly, than by looking at many which are only imperfectly described.

Having done thus much to show the whole anatomy of the structure, we may then provide perspective views both of the exterior and principal parts of the interior, in order to show the character and effect, which, without such drawings, can be judged of only piecemeal, and inadequately even by those who perfectly understand the others. *Bird's-eye views* of buildings are now seldom made use of. They are awkward, disagreeable, and unnatural representations in themselves, but altogether superfluous if a building is properly described by the other modes, or even by a block-plan and elevation alone.

DESIGN, SCHOOLS OF. In France and in several of the German States, schools in which drawing and the principles of design are taught have been long established. In Prussia there are many elementary schools at Berlin and several provincial towns, in which drawing and modelling from the antique, and geometrical and architectural drawing are taught at an average fee of 12*s.* per year. From these schools the more promising of the pupils are removed to the 'Gewerb-Institut' (Manufacturing Institute), and the 'Bau-Akademie' (Architectural Academy). In the former of these two, the studies have reference to all the branches of science or art bearing upon manufactures; in the second, all matters which bear in any way on building, civil engineering, or surveying: in these schools the instruction is gratuitous. The highest class, in which the fine arts are embraced in their widest range, is the Royal Academy at Berlin.

In *Bavaria*, education in art is mixed up with general education, but it is made to occupy a prominent place. The earliest stages are taught at the elementary schools; the next stage at the gymnasia, of which there is one in each large town; and the last stage at the lycea, of which there are three in the kingdom, at Munich, Nürnberg, and Augsburg; that at Munich being chiefly for architecture and the application of the fine arts to manufactures, that at Nürnberg to metal-casting and wood-carving, and that at Augsburg to textile manufactures.

In France, there are, intermediate between the elementary schools and the royal academies, several others which treat of art in its relation either to manufactures or to science, and which are either supported partly by the state and partly by municipalities, or are private establishments assisted by municipalities; and in most of them a very extensive system of studies is pursued, bearing in various ways on the science and the fine art of manufactures. The school of art at Lyon, in particular, is an important one in connection with the silk manufacture carried on in that city; and every endeavour is there made to foster taste in manufactures.

The advantages which resulted to the manufactures of the countries in every department requiring the display of taste was so obvious, particularly as displayed in the silk manufactures of France, that a strong desire was felt by the manufacturers and merchants of England to secure similar advantages for this country. Accordingly, in 1836, a school of design was established at Somerset House in connection with the Board of Trade, but under the control of a council and director, with masters in several departments. The school continued to make progress; but the management was not on the whole satisfactory, and early in 1848 the Board of Trade resumed the direct control, and the director and the council were dispensed with. The schools are now under the management of a committee, consisting of the principal officials of the Board of Trade, assisted by three eminent artists in the departments of painting, sculpture, and architecture. The general business arrangements and management of details are assigned to the resident secretary. Admission to students is granted on the recommendation of two respectable persons, for a probationary period of three months, but no instance of rejection has occurred since the alteration in the management of the schools. The terms and hours of attendance have varied more than once since the opening of the school. There are two classes; one in the morning from ten till two, the other in the evening from half-past six till nine, on every week-day except Saturday. The payment is two shillings per month for morning or evening attendance. Lectures are occasionally delivered by the teachers. There is also a morning school for females, established in 1842, to which the payment is of the same amount. The instruction given is of a character to enable the student to apply the principles of high art to the purposes of the manufacturer and the decorator. The primary classes at the school are three —form, colour, and ornament; and it is said to be purposed to blend colour and ornament into one class. Choice specimens have been obtained from Italy of arabesques, mosaic pavements, terra-cottas, &c. M. Guizot has presented to the schools casts from the celebrated gates of the Baptistery at Florence, and there is also a large collection of other casts from the antique, and of Gothic, and other styles of ornament. Specimens of paper hanging, silk, glass, porcelain, bronze, wax ornaments, and other objects have been provided by government for the use of the schools. Books, many of them expensively illustrated, have been purchased, forming a library of reference in matters relating to art and decoration; and some of these books are, under certain regulations, lent out to the students. Books, casts, and other examples of art are supplied by the committee to all the branch schools.

The number of pupils at present (June 1848) attending at Somerset House is about 80 in the morning, 260 in the evening, and about 50 females. The greater part of the students are the sons of tradesmen and of the upper class of artisans; the females are principally the daughters of professional men, or such as are being educated for governesses.

In connection with the School of Design at Somerset House, there are several branch schools. One is established in Spitalfields, where the

attendance approaches to 400. The other schools are at Manchester, Birmingham, Coventry, Nottingham, Sheffield, York, Leeds, Huddersfield, Newcastle-on-Tyne, Norwich, Stoke-upon-Trent, Hanley, Glasgow, and Paisley; all of which are well attended, and have been productive of much good. Some of the students have already become teachers in the schools, and many have successfully applied their talents to the improvement of our native manufactures.

There is one other school, that at Edinburgh, which is not in connection with Somerset House. It was established some years previous to that at Somerset House, under the sanction of the Board for the Improvement of Manufactures and the Herring Fishery. It has been well attended, and two of the early conductors at Somerset House were formerly masters there. Its object is nearly the same; the chief distinction is, that in Edinburgh it is the only school of art, while in London there is the Royal Academy for the more aspiring and ambitious.

DESMOPHY'LLUM, a genus of Zoophyta, fossil in the London clay of Sheppey. (*Geological Trans.*, N. S., vol. v.)

DESPOTISM. [MONARCHY.]

DESSALI'NES, JACQUES, a negro from the Gold Coast of Africa, was imported into the French colony of St. Domingo as a slave. Having become free, like all his fellow slaves, by a decree of the Convention, Feb. 4, 1794, he soon figured in the insurrection of the blacks against the white colonists. Toussaint l'Ouverture made him his first lieutenant, and he distinguished himself particularly against generals Rigaud and Leclerc in 1802. After Toussaint's capture by the French, Dessalines submitted for awhile, but was soon after at the head of a new insurrection, and contributed greatly to the victory of the blacks at the battle of St. Marc, which decided the evacuation of the island by the French in October 1803. In 1804 he had himself proclaimed emperor of Haiti, under the name of Jacques I., but his cruelty and arbitrary conduct led to a conspiracy, at the head of which were Christophe and Pethion, and he was killed at a review, in October 1806.

DESSAU, ANHALT. [ANHALT.]

DESSAU, the capital of the Duchy of Anhalt-Dessau, is situated on the west bank of the river Mulde, in 51° 50′ N. lat., 12° 17′ W. long. Dessau consists of the Old Town, the New Town, and the Sand; of a suburb before the Mulde-Gate, and of the Wasserstadt, which is on the east bank of the Mulde, and is connected with the main town by a wooden bridge resting on stone piers. The chief buildings are—the ducal palace, a handsome structure, the palace of the heir-apparent, and the theatre, a reformed church, a Protestant church, a Catholic church, and a synagogue. The population is now about 12,000, of whom about 800 are Jews. Cloth, stockings, hats, and tobacco are manufactured. Dessau is 80 miles from Berlin, by the Berlin, Coethen, and Halle Railway, which passes through Dessau. (*Conversations Lexicon.*)

DESTOUCHES, PHILIPPE NERICAULT, was born at Tours, in 1680. He was educated for the law, and much displeased his relations by turning actor. His first dramatic piece, 'Le Curieux Impertinent' (founded on the episode of the same name in Don Quixote) was acted in 1710, and received with enthusiastic applause, and was followed by three other successful pieces. In 1717 Destouches accompanied Cardinal Dubois to England, where he married an English Catholic lady, and retired to an estate in France. In 1723 commenced his great reputation as a dramatist, for, though his former pieces had been successful, they rose little above mediocrity. His 'Philosophe Marié' raised him to a high rank among the comic writers of France. 'Le Glorieux,' which followed, was by some critics considered even superior to 'Le Philosophe Marié.' He continued to write for the stage till his sixtieth year, though the pieces he produced were not equal to the two already mentioned. From that time he devoted himself to theology, and wrote several essays against infidelity. He died in 1754.

DESVAUXIA'CEÆ, an obscure and little known natural order of plants, consisting of a few New Holland sedge-like herbs, of no known utility.

DETACHMENT, in military affairs, is a certain number of battalions of infantry and squadrons of cavalry which are selected from an army for the purpose of being employed on some particular duty.

The danger of being beaten in detail renders it, generally speaking, improper to have considerable divisions of an army far separated from the main body; but in warfare many circumstances occur which render such a measure advisable, as, for example, the necessity of keeping possession of certain important positions while the rest of the army is otherwise employed, of masking a fortress, or of protecting magazines. In these cases however great precautions should be taken that the detachment may not be cut off, and its distance from the main body should not be so great as to prevent it from rejoining the latter before it can be attacked by a superior force.

Detachments, when judiciously disposed on a field of battle, may contribute much to a victory by turning an enemy's flank while a powerful attack is being made in front; but the greatest foresight and a perfect knowledge of the ground are necessary in order that the operations of the main body and the detachment may take place at the proper times.

When an officer is detached with a few troops to watch an enemy, he should endeavour to get well acquainted with the ground, in order that he may be enabled to change his position according to circumstances, and he should keep his division concealed as much as possible. He may act offensively if a favourable opportunity should present itself; but, in general, his object is to gain information and keep the enemy on the alert rather than to fight.

Small detachments are sent out in presence of the army to perform outpost duty, to throw up field-redoubts, repair bridges, roads, &c., or to protect the flanks on a march.

DETERMINATE, a word applied in Mathe-

matics to those problems which have one answer only, or at least a certain and finite number of answers.

DETINUE is the English form of action for the recovery of goods and personal chattels, except deeds and charters, which have lawfully come into the possession of a defendant either by delivery or finding. The plaintiff recovers either the thing detained, or, if the thing cannot be had, the value of it, with damages for the detention. In order to enforce the redelivery, the court will frequently give very large damages, with liberty to reduce them to a small amount on payment of costs and restoration of the thing. This is the only remedy at law for the recovery of a personal chattel in specie, unless in those cases where they can be recovered by replevin. The action of detinue is similar to the Roman *actio depositi*, and is the same in its properties and forms as the action of debt, with this difference, that one is for the recovery of a chattel, the other of money. In order to ground an action of detinue, it is necessary—1, that the defendant came lawfully into the possession of the goods; 2, that the plaintiff have a property; 3, that the goods themselves be of some value; 4, that they be identified.

DETMOLD. [LIPPE.]

DETONATION is a chemical term employed to express combination or decomposition which occurs with noise and frequently with combustion. It occurs when oxygen and hydrogen, in certain proportions, are fired; when hydrogen and chlorine are heated by the sun's rays; when certain salts and oxides are struck or rubbed; and in some other cases.

DETRITUS and DEBRIS. Fragments of rocks, boulders, gravel, sand, trunks of trees, &c., detached from the summits and sides of mountains by the effect of the elements, or resulting from sudden convulsions at the surface of the earth, are termed *débris*. By *detritus* is understood the same débris finely comminuted or pulverised by attrition.

DETROIT. [MICHIGAN.]

DEUCALION is represented as the son of Prométheus and Clymene, or of Prometheus and Pandóra, and is sometimes called the father and sometimes the brother of Hellen, the reputed founder of the Greek nation. The seat of his authority was Thessaly, from which, according to tradition, he was driven to Parnassus by a great deluge, which however, according to Aristotle ('Meteorol.,' i. 14), occurred between Dodona and the Achelous. Thus it was represented as a local deluge, but afterwards the tradition was converted into a story of a universal deluge. The story is told by Ovid (*Metamorphoses*, i. 375).

DEULE. [NORD; PAS-DE-CALAIS.]

DEUTERONOMY, the fifth book of the Pentateuch, or Five Books of Moses. The Hebrew title 'ĕlleh had-devarim,' 'these (are) the words,' is taken from the commencing phrase. The Greek title Δευτερονόμιον, *deuteronómion*, given in the Septuagint translation, is equivalent to 'Mishneh torah,' being composed of two words signifying 'second' and 'law.' By the Jews this book is divided into ten paraschioth, or chapters. In the translations the number of chapters is thirty-four. The events directly related by the writer are comprised in a period of five lunar weeks, from the commencement of the eleventh month to the seventh day of the twelfth month of the fortieth year of the wandering of the Israelites in the Wilderness, after their departure from Egypt. The book is generally considered to have been written A.M. 2553, or 1451 B.C., by Moses, in the last year of his life, when at the age of 120, and in the plains of Moab (i. 5; Numbers, xxxiii. 50, xxxv. 1). The concluding chapter, which gives an account of the death of Moses, and of his having been buried by God, is believed by most but not by all of the commentators to have been not written by Moses, for some consider this account as a prophetic one, related in the past tense, a practice not unusual among the Jewish prophets. This last chapter is supposed by others to have been jointly or rather successively supplied by Joshua, Samuel, and Esdras. Dr. Adam Clarke adopts the opinion that it is properly the first chapter of the following book of Joshua. (Clarke's 'Bible,' Alexander's 'Heb. and Eng. Pentateuch.') This opinion seems probable, as the Pentateuch in some synagogue copies is written as one continuous whole.

DEUTZIA, a genus of deciduous shrubs, inhabiting the North of India, China, and Japan, and nearly allied to *Philadelphus*, with whose species they agree in habit. One of the species, *D. scabia*, is remarkable for its silicious stellate hairs.

DEUXPONTS (*Zweibrücken*), a pretty town, the capital of the former duchy of Deuxponts, now of a bailiwick, in the Bavarian Rheinkreis, stands in 49° 24′ N. lat., 7° 20′ E. long., on the Erbach, about 50 miles W. from Speier, and has 7300 inhabitants. It is situated among gardens and luxuriant meadows, encircled by eminences and woods. The town is surrounded by a wall, and is regularly built. Of the public edifices the principal is a handsome old palace, formerly the residence of the dukes of Deuxponts, and now converted into a Roman Catholic church. The inhabitants are engaged in manufacturing linen, leather, oil, plaster of Paris, tobacco, and steel ware. Deuxponts is the seat of a court of appeal, and has a lyceum, a gymnasium, and a house of correction. The Bipont edition of the classics, printed here in the last century, took its title from *Bipontum*, the Latin term for Deuxponts, which name was given to the town from the two bridges that cross the Erbach to the palace.

DEUX SEVRES. [SEVRES, DEUX.]

DEVENTER. [OVERYSSEL.]

DEVEREUX. [ESSEX.]

DEVERON. [ABERDEENSHIRE.]

DEVICE, an emblem or ensign, formerly borne on shields or embroidered upon banners as a cognizance, contemporary, in the history of heraldry, with coat-armour itself. They frequently had reference to the name, or perhaps formed the name of the bearer: as the broom, or planta-genista, borne by the Plantagenets, and the swallow (Thirondelle), borne by the Fitz-Alans, earls of

Arundel. Camden, in his 'Remains,' has a section entitled 'Rebus, or Name-Devices,' accompanied by mottoes or quotations descriptive of enterprise, or of the general character of the bearer. Such were called Impresses, from the Italian word 'Impresa.'

DE'VILLE-LES-ROUEN. [SEINE-INFE'RIEURE.]

DEVISE. [WILL.]

DEVIZES. [WILTSHIRE.]

DEVONIAN SYSTEM. A great portion of the palæozoic strata of North and South Devon has been thus termed by Sedgwick and Murchison ('Geol. Trans.'), and also referred to as of coeval formation with the old red sandstone of Herefordshire. Further investigation has shown that a portion of the strata in North Devon belongs to the Carboniferous system, and is equivalent to the lowest shales and sandstones thereof. The old red-sandstone must certainly be admitted to be coeval with some parts of the Devonian strata, which besides contain several red sandstone members; but there is reason to think that the true place of much of the stratification of South Devon, on the ordinary geological scale, is rather about the upper part of the old red sandstone; and this mode of viewing these rocks harmonises with the distribution of organic remains in the Silurian, Devonian, and Carboniferous deposits.

DEVONPORT, a seaport and parliamentary borough, formerly called Plymouth Dock, is 218 miles W. by S. from London, and one mile and a half W. from Plymouth.

Devonport owes its present importance to a naval arsenal established there in the reign of William III., under the name of Plymouth Dock, which name it retained till 1824, when the appellation of Devonport was conferred on it by royal permission. It was first fortified in the reign of George II., but the fortifications have since been considerably enlarged and improved.

Devonport is situated at the south-west corner of the county, and is bounded S. and W. by the mouth of the river Tamer, which forms the spacious harbour of Hamoaze, and E. by Stonehouse Creek. The streets are wide and regular, well paved, and lighted with gas; the footpaths are made of marble obtained in the neighbourhood. The houses are generally large and well built. A wall, 12 feet in height, defends the town on the north-east and south sides; and the heavy batteries on Mount Wise protect the entrance from the sea. Without the wall is a line or breastwork, with a fosse excavated in the solid rock from twelve to twenty feet deep. There are several barracks.

The town-hall is a spacious and handsome building, with a Doric portico. It contains a county-meeting room, a watch-house, temporary prison, engine-house, &c. Near it is a fluted column of the Doric order, to commemorate the naming of the town in 1824. There are two episcopal chapels of ease at Devonport, besides the dock-yard chapel. There are places of worship for Baptists, Independents, Wesleyan Methodists, and Moravians. The town has a small theatre, a subscription library, and a spacious assembly-room at the royal hotel, where balls are held. The water which supplies the inhabitants is brought from Dartmoor in a circuitous line of about thirty miles to a reservoir on the north side of the town, whence it is conveyed in pipes to the different houses.

The dock-yard, one of the finest in the world, comprises an area of seventy-one acres. Within the yard is the basin, constructed in the reign of William the Third, and the dock, sufficiently capacious for the reception of a seventy-four gun ship, as well as four building-slips, and three other docks. The 'blacksmith's shop' is a building 210 feet square, containing about 50 forges. Several hundreds of anchors, some weighing five tons each, are piled up on the wharf in front of this building.

The 'rigging-house' is a splendid edifice 480 feet in length, and three stories high; it forms one side of a quadrangle, the area of which is entirely composed of stone and iron, and is called the 'combustible storehouse.' Our limits will not permit us to describe one half the objects of interest that are contained within the precincts of this dock-yard, and we must content ourselves with merely mentioning the boiling-house, the mast-house, the mast-pond, and the rope-houses. The rope-houses are buildings of limestone 1200 feet long, parallel to each other, and two stories high. Cables are made here, 100 fathoms in length, and measuring 25 inches in circumference. The harbour of Hamoaze is four miles long and half a mile broad; its greatest depth at high water is about 20 fathoms, and at low water 15.

Devonport returns two members to parliament, and the borough includes the town of Stonehouse, which lies between Devonport and Plymouth. Population of Devonport, 33,820; of Stonehouse, 9712; total, 43,532.

Devonport is a branch of the port of Plymouth. [PLYMOUTH.]

DEVONSHIRE, a maritime county in the south-west part of England. It is bounded N. and N.W. by the Bristol Channel; N.E. by Somersetshire; E. by Dorsetshire; S.E. & S. by the English Channel; and W. by Cornwall. There is an insulated portion of the county inclosed between Dorsetshire and Somersetshire. The length from N. to S. is about 71 miles; the breadth from E. to W. about 68 miles. The area is 2585 square miles, or 1,654,200 acres. The population in 1841 was 533,460.

Coast-Line, Surface, Hydrography, &c.—The coast of the Bristol Channel which bounds Devonshire to the north and north-west is for the most part steep and rocky. It forms the headlands of Bull Point, Morte Point, Baggy Point, and Hartland Point, and the bays or inlets of Rockham, Morte, Barnstaple, and Lynmouth. The southern, or English Channel coast, is a succession of beautiful cliffs and bays. Leaving Dorsetshire, we come first to a range of cliffs, broken by the rivers Axe, Otter, Ex, and Teign, and by the headlands of Beer Head and Hope's Nose; then comes the deep inlet of Torbay, bounded on the south by Berry Head; a succession of bluffs to Start Point,

broken by the river Dart; the shallow and sandy inlet of Start Bay; a high rocky coast to Prawle Point; a continuance of cliffs past Kingsbridge River, Bolt Head, Bolt Tail, to Plymouth Sound; and the fine estuary which this sound forms for the rivers Tamer and Plym.

Lundy Island, in the Bristol Channel, 10 to 11 miles N.N.W. of Hartland Point, belongs to Devonshire. It is a mass of granite two miles and a half long from north to south, and about a mile from east to west. Its area is about 900 to 1100 acres, and its height 200 feet above the sea. It is surrounded on every side with rocks; the landing-place, up which two men can scarcely walk abreast, is on the eastern side. The southern point is occupied by a light-house. Rat Island is a rocky detachment from Lundy Island on the south-east or south.

Devonshire is more uniformly hilly than any other of the large counties of England. The principal ranges of hills may be considered as offsets from the elevated districts of Dartmoor, Exmoor, and Blackdown. Dartmoor is a granitic tableland, having its greatest elevation towards the north, and containing the highest ground in Devonshire. Cawsand or Cawsorn Hill, in the northern part of the forest, is 1792 feet high; and there are other hills exceeding 1000 feet in height. Dartmoor extends about 22 miles from north to south, and 14 from east to west, and consists of an undulating plateau almost without vegetation, and without dwellings. The soil beneath is of a boggy nature, of small depth in most places, but in some parts very deep. Peat is dug: and many sheep are pastured there in summer, and some all the year round. The elevation of Dartmoor causes it to have a much lower average temperature than other parts of the county. Dartmoor is an elevated plain; the descent to the lower country all round is rapid. From Dartmoor several ranges of hills, composed chiefly of rocks of the transition series, branch off; one towards Hartland Point, another nearly to Barnstaple, another towards Exeter, and a fourth nearly to Dartmouth. Exmoor is a tract of high land, having its greatest elevation towards the north. It is composed of rocks of the transition class, and is chiefly included in Somersetshire, but extends into the north and north-east parts of Devonshire. Blackdown, the third elevated tract, lies in the eastern part of the county, and sends off several minor ridges of hills.

The rivers of Devonshire are numerous, and some of them important. The Ex reaches the border of Devonshire about 18 or 19 miles from its source; it passes through or near Tiverton, Exeter, and Topsham, and receives the rivers Barle, Batham, Loman, Culm, Dart, Creedy, Yeo, and Clist; it is a tidal river to Topsham. The Torridge rises on the border of Devonshire and Cornwall, near the head of the Tamer, and flows near Putford, Bradford Mill, Sheepwash, Torrington, and Bideford, to the junction with the Taw at Appledore; it receives the Waldon and the Okement. The Taw rises on Dartmoor, and flows past Brushwood to the bay at Barnstaple, receiving in its course the Little Dart, and the Mole. The Dart also rises on Dartmoor: it consists of two streams, the East and West Dart, which unite between Ashburton and Tavistock, and pass by Totness to Dartmouth. The Teign rises near the head of the Dart, and flows by Dunsford, Chudleigh, and Newton Bushel, to Teigumouth. The less important rivers are the Otter, Axe, Yart, Aune, Erme, Yealm, Plym, Deer, Carey, Lyd, Tavey, Low Water, Thistle Brook, Wallcomb, Lynn, and Sid. The Tamer belongs more to CORNWALL.

The Bude and Holsworthy Canal, with which is connected the Bude and Launceston Canal, enters this county from Cornwall, near the head of the Tamer, and proceeds thence to the river Waldon. A short canal extends from Torrington to Wear Gifford; another short one extends from Newton Bushel to Bovey Tracey; and two similarly short canals from Exeter to Topsham, and from Tavistock to the Tamer. The South Devon Railway, now (1848) open nearly to Plymouth, runs through the county. There are also sanctioned and partly opened, in Devonshire, a part of the Bristol and Exeter Railway; minor branches to Exmouth, to Torbay, to Ashburton, and to Tiverton; and a line of railway from Exeter through Crediton, Chumleigh, and Barnstaple, to Bideford, with a branch to South Molton. There are also a few railways for mineral traffic only.

Geological Structure.—A few spots occur in the eastern portion of the county and along the coast between Sidmouth and the border of Dorsetshire, which are occupied by outlying portions of the chalk formation. The greensand formation presents on the confines of Dorset and Devon many outlying masses forming considerable hills. To this formation belong the flat-topped hills of Blackdown, and many of the ranges of hills springing from that centre; these greensand heights are for the most part unreclaimed heaths. Eastward of Blackdown the greensand rests upon lias. On the western and southern sides of Blackdown the greensand overlies all the oolitic formations, and rests immediately upon the red marl, which, with the accompanying sandstone and conglomerate, constituting the formation designated the new red sandstone, occupies the tract from the Blackdown Hills westward to the valley of the Loman and the Ex. The red marl comes to the surface in a few other spots.

The district occupied by the various formations enumerated above is small, compared with that which consists of the rocks of the transition class. These occupy all the county northward and westward of the new red sandstone, except the primitive district of Dartmoor. These transition rocks consist of an argillaceous slate, which in some parts rises to a height of 1800 feet. The undulating surface of the country may be partly ascribed to the predominance of the argillaceous slate. These slate rocks are quarried for roofing-slates: they are metalliferous, affording ironstone, and veins of tin, copper, and lead. A few lead and copper mines are wrought in North Devon; the lead is combined with silver. The greenstone occurs in various parts of the slate district on the northern and western sides of Dart-

moor: and detached portions of amygdaloidal trap, observed in many situations round Dartmoor, may probably be referred to this formation. Some parts of the transition district contain imperfect coal or lignite called Bovey coal.

Granite forms the mass of Dartmoor. Numerous rifted rocks, called *tors*, are scattered over the surface of this moor. The Dartmoor granite is quarried and exported to a considerable extent, especially to London. It is metalliferous.

Soil and Agriculture.—The lower hills which occupy so large a part of the surface of this county are covered with grass; the higher with moor and rock. The county contains along its numerous rivers many fertile meadows, some of which are only imperfectly irrigated, and others not at all. The improvements in the cultivation of arable land, which have been rapidly introduced into other counties, have not been so favourably received in Devonshire. The oldest system of Devonshire cultivation is a rude species of convertible husbandry. When grass land begins to wear out, the surface is pared thin, and the sod when dried is burnt in heaps. The ashes thus produced stimulate the soil and enable it to bear a few crops, frequently three corn crops in succession. When the land is thus nearly exhausted, it is laid down again in grass without much care, and is pastured for eight or nine years, when the same process is repeated. A great part of North Devon is above mediocrity as to fertility, and portions of the southern part of the county are highly productive. Considerable wastes and heaths have been gradually brought into cultivation; and although many wastes and commons still remain, and there are extensive moors and bogs scarcely susceptible of improvement, the quantity of land which is productive in grass or corn is very considerable for so hilly a country. The grass land occupies more than four-fifths of the soil under cultivation. The rapid growth of weeds in the climate of Devonshire renders all the corn crops very foul, even after a good fallow. Some of the lands on the hills are so steep that the crop must be brought home upon horses, who carry a pack-saddle with large hooks on each side, in which the sheaves are laid.

A considerable quantity of potatoes is raised in Devonshire and sent to London, where they obtain good prices: they were formerly planted in lazy-beds, as in Ireland, but the superior method of single rows moulded up is now very generally adopted. Grass land being far more abundant in Devonshire than arable, butter, cheese, and live stock may be considered as the chief agricultural produce for exportation. The finest and richest meadows are situated on the alluvial borders of the principal rivers. The upland meadows are less productive, and require occasional manuring. They will produce from 20 to 30 cwt. of superior hay for horses by being shut up in March. The clouted cream of Devonshire is a well-known delicacy. It is made by heating the milk on the hearth, or by means of a stove, to a degree a little below the boiling point, when the clouted cream rises to the top like a thick scum, and is taken off when cooled. This cream, being merely stirred briskly with the hand or a stick, is converted into butter. The cows used for the dairy are almost exclusively of the breed of the county, and of a red colour. They are handsomely shaped, and some of them give much good rich milk. Cheese is made of skimmed milk, and is consequently inferior in quality.

A great many oxen are reared and annually exported from all parts of Devonshire, but chiefly the northern parts. The cows of the pure North Devon are chiefly kept to breed: for the dairy they are improved by a cross with a short-horn. The sheep fed on the hills and wastes of this country are of a peculiar breed, with fine wool and excellent flesh. The Exmoor sheep are extremely hardy, and well adapted to cold bleak mountains. The pasture on Dartmoor Forest is very good, and the rot is almost unknown there. The race of pigs in Devonshire is very good generally; and in some districts, where care has been taken to select the best animals and cross the breeds with judgment, as fine hogs are fatted as in any part of England.

The farm buildings in Devonshire are frequently inconveniently situated with respect to the farm. The object seems to have been to choose a sheltered spot, without regard to the situation of the land attached to the farm. The farms are not so extensive as in the more level parts of England; 150 to 200 acres, of which at least three-fourths are pasture, are considered a large farm. There are also in this county many more small proprietors and lessees for ninety-nine years than in most other parts of Britain. They are mostly frugal and industrious, and, if they do not cultivate their land in the most approved manner, they at least contrive to live comfortably.

The chief beverage of the Devonshire people is cider, which is here superior to any other in England. The soil on the slopes of the hills is peculiarly adapted to the growth of fruit-trees, especially on a loose rocky bottom, where the roots may insinuate themselves and find moisture at all times. Most of the orchards now show symptoms of old age, and gradually diminish in produce. A new generation of apples is much wanted, and will no doubt arise to take the place of the old. The true golden pippin and the cocagee are now nearly extinct; but many new varieties have been raised from seed, some of which may probably rival the old, if not surpass them.

Devonshire was formerly no doubt well wooded, and in some places there are still fine trees; but the progress of cultivation has greatly diminished the timber, and, except in sheltered situations, trees do not thrive and acquire so great a size as they seem to have done when they sheltered one another. Coppice wood however is plentiful, most of the steep sides of hills towards the banks of the rivers being covered with this growth, which adds considerably to the beauty of the valleys. The wood growr in Devonshire is chiefly oak; but beech, ash, and elder are interspersed, according to the soil and situation.

Divisions, Towns, &c.—Devonshire is divided into 32 hundreds. It is in the diocese of Exeter, and forms 3 archdeaconries. It is in the Western

Circuit. The Assizes and Quarter Sessions are held at Exeter. The Stannery Laws are in force in the mining district in the south-west part of the county. For parliamentary purposes the county is divided into a northern division and a southern division, each of which returns 2 members to parliament; in addition to which Barnstaple, Devonport, Exeter, Honiton, Plymouth, Tavistock, Tiverton, and Totness return 2 members each; and Ashburton and Dartmouth return 1 member each; making altogether 4 for the county and 18 for the boroughs.

The following are the principal towns, with the population of each in 1841:—

Appledore is a port and market-town on the river Torridge, just at its junction with the Taw, 6 miles W. by S. from Barnstaple. It has a considerable coasting trade. Population of West Appledore and East Appledore, 2174.

Ashburton, a parliamentary borough, is 19 miles S.W. from Exeter. A small stream flows through the town, and falls into the river Dart about two miles to the S.W. The houses are mostly well built, and covered with slate, which abounds in the neighbourhood. The church is ancient, of perpendicular architecture, with a tower 90 feet high, surmounted by a small spire. An endowed grammar-school is held in the ancient chapel of St. Lawrence, which adjoins the church. The borough returns one member to parliament. Population, 3841.

Axminster, a market-town, is situated near the eastern boundary of the county, 26 miles E. from Exeter, on the south-eastern bank of the river Axe. The streets are wide and clean. The church is ancient, and heavy in appearance, with a Norman doorway. Carpets of superior quality are manufactured. Population, 2139.

Bampton, a market-town, 12 miles N. by E. from Exeter. Two yearly fairs are held at Bampton, one on Whit-Tuesday, the other at the end of October, at which some exceedingly fine sheep are sold. Population of the town, 1275.

Barnstaple. [BARNSTAPLE.]

Beer-Alston, a small market-town, situated in a picturesque country between the rivers Tamer and Tavy, 10 miles N. from Plymouth, and 6 miles S.W. from Tavistock. Beer-Alston sent two members to parliament, but was disfranchised by the Reform Act. Population of the parish of Beer-Ferris, which includes Beer-Alston, 2142.

Bideford, a port, municipal borough, and market-town, is situated at the mouth of the river Torridge, on both sides, 9 miles S.W. from Barnstaple. The town consists principally of two wide and well-paved streets, with well-built houses, the rest being narrow and dirty. A handsome bridge, 667 feet long, crosses the Torridge. The church is ancient, and rather a fine building, with a carved stone screen inside, and several interesting monuments. The port has a little foreign trade, the principal imports being timber from North America and the Baltic, sugar and tobacco from the West Indies, and coals from Bristol and Wales. The exports are oak-bark, oats, malt, sails, cordage, &c. Ship-building is carried on to a great extent, in nine or ten building-yards.

The town has an endowed free grammar-school of very ancient foundation, in which 10 boys are taught. Population, 4830.

Brixham, a small fishing-port and town, is on the south side of Berry Head, about 7 miles S. from Torquay in a direct line across Torbay. The part near the sea is called Brixham Quay, or Lower Brixham, and consists of narrow and dirty streets. The upper part, called Church Town, is about a mile distant, and contains several good houses. Population of the parishes of Upper and Lower Brixham, 5634.

Chagford is near the south bank of the Teign, and about 15 miles W. by S. from Exeter. This small town lies in a picturesque situation at the foot of some rugged and lofty hills. The church is an ancient structure. Population of the town, 1043.

Chudleigh is a short distance from the east bank of the Teign, 9 miles S.S.W. from Exeter. The town, which is situated in a delightful country, chiefly consists of one long street. Population of the parish, 2415.

Chumleigh is situated on the north bank of the Little Dart, just above its junction with the Taw, 22 miles N.W. from Exeter. It is a small town. Population of the parish, 1647.

Collumpton is on the west bank of the Culm, a tributary of the Ex, 12 miles N.E. by N. from Exeter. The town is of tolerable size, having its main street along the Exeter and Taunton road, nearly a mile in length; other shorter streets branch off from this. The houses are tolerably well built, some covered with slate, and some thatched. The Bristol and Exeter Railway passes by Collumpton. The church is very ancient and handsome; it is in the perpendicular English style, and has an elegantly carved and gilt roof. The tower is 100 feet high. Population of the parish, 3909.

Colyton is situated on the little river Coly, a feeder of the Axe, about 22 miles E. from Exeter. The town is pleasantly situated, but small. The houses, many of which are ancient, are principally built of flint and covered with thatch. The church is a fine cruciform structure, in the perpendicular English style: it was enlarged by subscription in the course of the present century. Population of the parish, which includes also the village of Colyford, 2451.

Crediton is near the junction of the brook Yeo with the river Creedy, 8 miles N.W. from Exeter. The town is divided into East Town and West Town: it is irregularly built; the principal street runs nearly east and west, between two hills, of which that on the south rises with a quick ascent and overtops the houses. The church is a handsome cruciform structure in the later perpendicular style of architecture, and was probably erected about the close of the 15th century. Population of the town, 2245.

Culmstock is not far from the border of Somersetshire, is on the south bank of the river Culm, 20 miles N.E. from Exeter. There is an ancient church and a market-house, but the market has much declined. Population of the parish, 1446.

Dartmouth, a sea-port, municipal borough, and parliamentary borough, is pleasantly situated on a

declivity on the west bank of the river Dart, 30 miles S. by W. from Exeter. Some of the houses are extremely old and possess some fine specimens of wood-carving; but generally the town is dirty, and the streets narrow and ill-paved. There are three churches, and places of worship for four or five classes of dissenters. The country around is exceedingly beautiful and picturesque. There is a flying bridge across the river Dart. The harbour is very safe and convenient, and can accommodate 500 ships. A great number of the inhabitants are employed in the Newfoundland and other fisheries. The number of vessels registered Jan. 1, 1818, was 451 (32,080 tons). The river Dart is navigable as far as Totness, and its banks are surrounded with beautiful scenery. The borough is governed by 4 aldermen and 12 councillors. Population, 4417. The parliamentary borough returns one member to the House of Commons. Population, 4663.

Devonport. [DEVONPORT.]

Exeter. [EXETER.]

Hatherleigh is on the east bank of a stream which flows into the Torridge a short distance above its junction with the Okement, 28 miles W.N.W. from Exeter. Hatherleigh is a small market-town. Population of the parish, 1882.

Holsworthy is not far from the east bank of a small stream which flows southward into the Tamer, 42 miles W. by N. from Exeter. The Bude and Holsworthy Canal, which unites with the Bude and Launceston Canal, passes near the town. It is a very small market-town, four or five villages being included with it in the population of the parish, which is 1857.

Honiton is a market town and parliamentary borough, situated near the south-east bank of the river Otter, 17 miles E. by N. from Exeter. The town consists principally of one broad and handsome street, crossed by another at a right angle. Through the former flows a small clear stream, which supplies the inhabitants with water. The houses are mostly modern, and the streets are well paved and lighted. Excellent lace is here manufactured. The parliamentary borough, which returns 2 members to the House of Commons, is coincident with the parish, and has a population of 3773.

Ilfracombe is a sea-port and market-town, on the coast of the Bristol Channel, 10 miles N. from Barnstaple. There is a considerable coasting trade and herring fishery. The town consists of one main street extending along the sea-coast, and reaching at the north-east end to the harbour, which is formed by an inlet or cove of the Bristol Channel, very commodious and safe, affording anchorage to vessels of 230 tons, and rendered additionally secure by a pier 850 feet in length. Oats are the chief article of export. The shore is convenient for bathing, and there are warm baths for invalids. The town is much resorted to as an agreeable summer residence. Population, 2855.

Kingsbridge is about 7 miles N.W. from Start Point, on the south coast, at the head of a considerable æstuary into which a number of small streams flow: it is 35 miles S.S.W. from Exeter. The town may be considered as composed of Kingsbridge, and Dodbroke, which is separated from Kingsbridge only by a rivulet. Ships of considerable burden can come up to the town at high water, and there are two quays, one in Dodbroke, and the other adjacent to Kingsbridge. Cider, corn, malt, and slate are exported; the chief imports are coals. The corn-market is one of the largest in Devonshire. Kingsbridge consists mainly of one street on the Modbury and Plymouth road; Dodbroke, of one on the Exeter road: these streets unite at the lower end of the town near the haven. Population of Kingsbridge parish, 1564; of Dodbroke parish, 1229.

Modbury is situated on a rivulet, which flows into the Erme, 35 miles S.W. from Exeter. The town consists of an irregular assemblage of streets. The church is spacious and handsome; the tower is 134 feet high, built soon after the church in 1621. Population of the parish, which includes also several villages, 2048.

South Molton is a market-town and municipal borough, 28 miles N.W. from Exeter, on the west bank of the river Mole. The town is well situated for business at the convergence of several principal roads. It consists of several streets, well paved, with flagged foot-ways, and lighted. It has a spacious market-place, a guildhall, a borough gaol, and a union workhouse. The church is a handsome building in the perpendicular style of architecture; it has a rich stone pulpit adorned with statues and a profusion of carved foliage. The woollen manufacture is carried on at South Molton to some extent. The municipal borough is governed by 4 aldermen, and 12 councillors. Population of the town, 3597.

Morcton Hampstead is near the Wadley brook, which flows into the Bovey river, and so into the Teign, 12 miles W. by S. from Exeter. The town is situated on a gentle eminence bounded on almost every side by high hills. The principal street runs for about half a mile along the Exeter and Plymouth road. Population of the town, 1450.

Newton Abbot is separated from Newton Bushel only by a narrow brook which flows into the Teign. The two places may be considered as forming one town a short distance from the south bank of the Teign, 15 miles S. by W. from Exeter. Newton Abbot is a small market-town. Population, 1192.

Okehampton is situated at the junction of the East and West Okement rivers, 22 miles W. from Exeter. The town, which is irregularly built, lies in a valley, and is surrounded by rich meadows and wooded acclivities. Population of the parish, which includes several hamlets, 2194. Okehampton was formerly a parliamentary borough, but was disfranchised by the Reform Act.

Ottery St. Mary is on the east bank of the river Otter, 12 miles E. from Exeter. The town is irregularly laid out, but in a pleasant situation. The church, formerly collegiate, is large, and resembles Exeter Cathedral in having two towers for transepts. Population of the parish, 4194.

Plymouth. [PLYMOUTH.]

Plympton-St.-Maurice, commonly called *Plympton-Maurice* or *Plympton-Earl*, is not far from the south bank of the Tory brook, which flows into

the Plym, about 39 miles S.W. from Exeter. Population, 933. Plympton-St.-Maurice was formerly a parliamentary borough, but was disfranchised by the Reform Act.

Sidmouth is situated at the mouth of the Sid, 14 miles E.S.E. from Exeter. The town is in front of the sea, and the narrow valley behind it has detached houses and villas on each side of the small stream which flows through it. Sidmouth was formerly a considerable fishing-town, but the harbour has been choked up, and the town would have fallen into decay had it not risen into some importance as a watering-place. There are baths, public rooms, and a library. The parish church is ancient, and has been enlarged in recent times. Population of the parish, 3309.

Stonehouse is situated between the towns of Devonport and Plymouth. It is separated from Devonport by Stonehouse Creek, and by a long and steep ascent unoccupied by buildings, but is joined with Devonport as a parliamentary borough. With Plymouth it is connected by uninterrupted lines of buildings, and may therefore be considered as a suburb of Plymouth. The streets are tolerably wide and regularly laid out. The parish church was built in 1789, and the episcopal chapel in 1831. There are several places of worship for dissenters, and many schools. Population, 9712.

Tavistock is a parliamentary borough and market-town, 11 miles N. from Plymouth, and 34 miles W.S.W. from Exeter, situated on the north-west bank of the Tavy, in a narrow valley, from which the ground rises steeply on both sides to the height of some hundreds of feet. The river is crossed by two bridges within the town. The parish church is an ancient and spacious edifice, with a tower at the west end resting on arches; and there are some fragments of the abbey of Tavistock, but chiefly incorporated with other buildings. Population of the town, 4622; of the parliamentary borough, which returns two members, 6075.

Teignmouth is situated at the mouth of the river Teign, on the north side of the river, 15 miles S. from Exeter by the South Devon Railway. It consists of East Teignmouth and West Teignmouth, which are separated by a small brook. Teignmouth is much frequented as a bathing-place. There are considerable exports of granite, pipe-clay, potters' clay, timber, bark, and cider: the imports are of culm, coal, deals, iron, &c. The inhabitants are much engaged in the Newfoundland fishery. There is a considerable fishery for soles, whiting, turbot, mackerel, and pilchards, on the coast, and for salmon in the river Teign. East Teignmouth Church is near the sea-shore; it has been rebuilt within a few years on an enlarged scale. West Teignmouth church is large and handsome; it was built under an act passed A.D. 1815. The town has a theatre, assembly-rooms, &c. The bridge over the Teign, opened in 1827, is 1671 feet long. Population of the parish of West Teignmouth, 2883; of East Teignmouth, 1576; total, 4459.

Tiverton, a parliamentary borough and municipal borough, is situated at the confluence of the Loman with the Ex, 15 miles N. by W. from Exeter. The town is on rising ground between the Loman and Ex, and is well supplied with water by a brook called the Town Leat. On the west side of the Ex is a large suburb called Westex, chiefly inhabited by the labouring classes. The Tiverton branch of the Great Western Canal enters Tiverton on the eastern side, and supplies the town and neighbourhood with coal, coke, limestone, &c. The chief manufacture of the town is of bobbin-net, which gives employment to a large number of the inhabitants. The parish church is a handsome Gothic structure, part of which is very ancient, but the greater part has been rebuilt. There is also a chapel of ease, and there are places of worship for several classes of dissenters, many endowed charities, and numerous schools. The town has a theatre, a union workhouse, and a bridewell. The municipal borough is divided into 3 wards, and is governed by 6 aldermen and 18 councillors. Population of the borough and parish, 10,040; of the town, 7769; of the parliamentary borough, which returns two members, 9838.

Topsham is 3¼ miles S.E. from Exeter, on the eastern bank of the Ex, at the junction of the Clist. It is the port of Exeter, at which the steamers ply to and from London. The town consists almost entirely of one street of irregular breadth, and about a mile in length, extending along the bank of the Ex, with a quay at the lower end of it. The houses are generally of mean appearance, but some of them are handsome. Population of the parish, 3733.

Torrington, called *Great Torrington*, to distinguish it from Little Torrington and Black Torrington, is a municipal borough and market-town, 36 miles N.W. from Exeter. The town is situated on a hill, on the north-eastern bank of the Torridge, over which there is a bridge communicating with the little suburb of Taddy Port. The principal manufacture carried on in Torrington and the country round is that of gloves. The borough is governed by 4 aldermen and 12 councillors. Population of the parish, 3419.

Totness, or *Totnes*, a parliamentary borough and municipal borough, is 23 miles S. by W. from Exeter by the road, and 29 miles by the South Devon Railway. The town stands on the slope of a hill on the west side of the river Dart. On the east side is Bridgetown, and the river is navigable for small vessels as high as the bridge which unites these two places. Totness is very ancient, and many of the old houses with projecting stories yet remain. The church is a handsome old Gothic building. There is a guildhall, a small gaol, a small theatre, and an assembly-room. The trade of the town arises chiefly from the extensive district which surrounds it. The municipal borough is governed by 4 aldermen and 12 councillors. Population, 3849. Population of the parliamentary borough, which returns 2 members, 4240.

History and Antiquities.—The earliest ascertained inhabitants of this county were the Damnonii. After the Roman conquest, Devonshire was included in the province of Britannia Prima; but nothing authentic is known of the details of the

conquest. Many of the ancient remains are attributed to times anterior to the conquest; such as the circular stone inclosures at Grimpspound and Bratton Fleming, the sepulchral stones at Maddocks' Down, the Cromlech at Drew's Teignton, and barrows or tumuli at Haldon and other places. An ancient British road traversed the county from east to west, forming the continuation of the Ikeneld Way. The Romans had stations or camps at Exeter, Totness, Tamerton, Foliot, and two or three others whose sites are not now well known. The Roman antiquities found in the county have not been numerous.

In the Saxon invasion this county became the scene of contest. Cynegils, king of the West Saxons, is said by the Saxon chronicle to have beaten the Britons at Beamdune, supposed to have been Bampton, A.D. 614. The pressure of the West Saxons gradually constrained the Britons to retire westward. Devonshire was for a long period debateable ground, it was in great part occupied by the Saxons; but there is reason to think that it was not until the reign of Athelstan, who is said to have defeated Howell, king of Cornwall, near Exeter, A.D. 926, that the Britons were finally compelled to retire beyond the Tamer. During many of the contests between the Danes and Saxons, the Britons aided the former in Devonshire. In the 10th century, when the county was nominally under the Saxons, the Danes made many predatory incursions.

When William of Normandy attacked England, his second campaign was in the west. Exeter yielded on his approach; but there were many subsequent contests between his descendants and the Anglo-Saxon inhabitants. The coasts were occasionally ravaged by the Irish, and the French made a few attacks on the sea-port towns; but for many centuries the county was marked by few political events of importance. Of the mediæval buildings of Devonshire, there are existing remains of the castles of Exeter, Plympton, Oakhampton, Tiverton, Berry Pomeroy, Compton, Afton, Gidley, Hemyock, Dartmouth, Kingswear, and Lidford; the old baronial mansions of Dartington and Bradley; and ecclesiastical and monastic establishments at Tavistock, Buckland, Buckfastre, Dunkeswell, Ford, Newenham, Hertland, and Tor Abbey, and Plympton Priory, and St. Nicholas's Priory, at Exeter.

In the great civil war of Charles I. the county seems generally to have embraced the cause of the parliament. Plymouth was seized by the townsmen during the absence of the governor appointed by the King, and the Earl of Ruthen was soon after made governor. Exeter was the headquarters of the Earl of Stamford, the parliamentary general. Many sieges and battles took place between 1643 and 1644, most of which were favourable to the parliamentarians.

DEW is the moisture in the air which is deposited in the form of minute globules on bodies near the surface of the earth.

Aristotle ('Meteor.,' lib. i. cap. x.) supposed that dew is a species of rain formed in the lower atmosphere, in consequence of the moisture which has been carried up during the day by evaporation being condensed in drops by the cold of the night. In 1788 Professor Wilson of Glasgow, in a paper which is published in the 'Transactions' of the Royal Society of Edinburgh, supposes that the coldness of the air is occasioned by the formation of the dew; and Mr. Six communicated a paper to the Royal Society of London in which he assumes that dew proceeds partly from the low temperature of the air through which the dew already formed in the atmosphere had descended, and partly from the evaporation of the moisture in the ground.

But the cause of the formation of dew has, by the experiments and reasoning of Dr. Wells ('Essay on Dew'), been proved to exist in the radiation from the earth, by night, of the heat communicated by the sun during the day: in consequence of this radiation, the temperature of the air is lowered, and the vapours which it held in solution are condensed in drops on the grass or on the surfaces of bodies near the earth. If the coldness is very great, the dew-drops are congealed and hoar-frost is formed.

It is remarked by Aristotle ('Meteor.,' lib. i., 'De Mundo,' cap. iii.) and by other writers that dew appears only on calm and serene nights; and the observation is, in general, well founded, since clouds restore to the earth all or a great part of the heat which may have radiated from it: even a single cloud near the zenith will sensibly raise the mercury in a delicate thermometer; and, on its disappearance, the fall of the mercury will show immediately that the earth has recovered its radiating power. It must be observed however that Dr. Wells frequently found a small quantity of dew on the grass on cloudy nights when there was no wind, and also on windy nights when the sky was clear; but he states that he never saw dew on nights which were both cloudy and windy.

The radiation from the earth is checked by placing above the ground or the radiating surface a cambric handkerchief or a piece of open wirework; and thus the coldness which would cause the formation of dew is diminished. That the temperature of the atmosphere near the surface of the ground is prevented by such means from becoming so low as it would otherwise be is a fact well known to gardeners, who constantly protect tender plants from the effects of the night air by covering them with mats.

Whatever diminishes the view of the sky, as seen from the exposed body, occasions the quantity of dew which is formed upon it to be less than would have occurred if the exposure to the sky had been complete; two parcels of wool, each weighing ten grains, were fixed, one on the middle of the upper surface of a board an inch thick, and the other to the middle of the under side; the two parcels were equally exposed to the action of the air: on weighing the two portions, it was always found that the upper portion had acquired most dew, the greatest difference being twenty grains to four grains.

Dew forms in very different quantities on different substances under the same circumstances: thus on metals it *is* sparingly deposited; on glass it forms abundantly, as it does also on straw,

grass, cloth, paper, and other similar substances. Now as the metals radiate heat imperfectly, and the other bodies which have been mentioned do so in a much greater degree, they become consequently colder than the metals, and hence condense more vapour into dew.

Animal substances are among those which acquire dew in the greatest quantity; among these Dr. Wells found that swan's down exhibited the greatest degree of cold in general, and was also most easily managed, as it was used while adhering to the skin of the bird.

To the greater or less quantity of moisture in the atmosphere at the time of the action of the immediate cause of dew, Dr. Wells refers several facts respecting its copiousness:—thus, it is more abundant shortly after rain than during a long season of dry weather. It is commonly more plentiful in spring and autumn than in summer; the reason is, that a greater difference is generally found between the temperatures of the day and the night in the former seasons of the year than in the latter.

Dew is always very copious on those clear and calm nights which are followed by misty or foggy mornings, the turbidness of the air in the morning showing that it must have contained during the preceding night a considerable quantity of moisture.

Dr. Wells observes that dew is unusually plentiful on a clear morning which has succeeded a cloudy night; the air, which during the night has lost little or no moisture, being then heavily charged with watery vapour. The heat of the atmosphere during the day, other circumstances being favourable, occasions a great formation of dew; for, the power of the air to hold water in solution being considerable when the temperature is high, a small decrease of temperature at night must bring the air nearer to the point of repletion before the cause of dew acts, than it would be if the day-temperature were low. Dr. Wells observes also that, the clearness and stillness of the atmosphere being the same, more dew is formed between midnight and sunrise than between sunset and midnight, though, from the previous precipitation of a part, the quantity of moisture in the air must have been less in the former than in the latter time. The reason, no doubt, is the greater coldness of the atmosphere during the later half of the night.

The following are a few of the observations made by Dr. Wells with respect to temperature on the evening of the 19th of August, 1813:—

	at 6½ P.M.	at 8½ P.M.
Heat of the air 4 ft. above the grass . . .	60½°	54° (Fahr.)
Heat of wool on a raised board . . .	53½°	44½°
Heat of swan's-down on the same . . .	54½°	42½°
Heat of a grass plat .	53°	42°

DEWBERRY, a kind of bramble, the *Rubus cæsius* of botanists, so named because its black shining fruit is covered over by a fine waxy white secretion resembling dew. It forms the type of one of the sections of the European part of the genus *Rubus*.

DEWSBURY. [YORKSHIRE.]

DE WITT, JOHN, was born at Dort, in the province of Holland, in September 1625. His father was a member of the states of Holland, and an opponent of the House of Orange. John de Witt, who inherited his father's principles, was made in 1652 grand pensioner of Holland, an office which gave him great influence over the deliberations of the States General, which he exercised to prevent in future the union of the offices of stadtholder, captain-general, and high admiral in one and the same person, which had rendered the princes of the house of Orange almost equal to sovereigns. During the minority of William III., the office of stadtholder was considered as abolished, and the States General exercised the supreme authority: De Witt was the soul of their deliberations, and he managed the foreign relations of the country with great ability. He negotiated the peace with Cromwell in 1654, by a secret article of which it was agreed that no member of the house of Orange should be made stadtholder or high admiral. After the restoration of Charles II., De Witt, dreading the family connection between him and young William, sought the alliance of France in 1664. A war broke out between England and the United Provinces, during which a fleet under De Ruyter entered the Thames and burnt some of the English shipping in the Medway. This was followed by the Peace of Breda, July 1667. The invasion of the United States however, in 1672, by Louis XIV., when the French army took possession of Utrecht, made De Witt extremely unpopular, as he was accused of not having taken sufficient precautions against the French. William, the young Prince of Orange, was called to the command of the forces, both by land and sea. Cornelius de Witt, John's brother, was accused of having plotted against the life of William of Orange, was thrown into prison at the Hague, tortured, and ultimately sentenced to banishment. His brother John resigned his office, and went to the Hague in his carriage to receive his brother as he came out of prison. A popular tumult ensued, the furious mob forced its way into the prison, and murdered both brothers with circumstances of the greatest atrocity, on August 22, 1672. (Sir William Temple, *Observations on the United Provinces; the Netherland Historian*, 8vo., Amsterdam, 1675, &c.)

DEX'AMINE, a genus of amphipodous crustaceans, established by Dr. Leach.

Generic Character.—Antennæ three-jointed, the last segment composed of a number of minute joints; first segment shorter than the second; upper antennæ longest. Eyes oblong, not prominent, inserted behind the superior antennæ. Legs fourteen; first and second pairs monodactyle, with a small compressed hand; other pairs furnished with simple claws. Tail, on each side, with three double styles; above, with one small style on each side. Body (including the head), twelve-jointed. (Leach.)

Example, *Dexamine spinosa*. Body shining,

the ninth, tenth, eleventh, and twelfth segments produced into a spine; front produced and bent downwards between the antennæ. The first joint of the upper antennæ beneath towards their tips have a little spine-like process. Length three quarters of an inch. (Leach.) Dr. Leach says that it is very common on the southern coasts of England, and is often taken by the shore-net, or beneath stones amongst the rocks at low tide. The legs, he observes, are easily broken, which will account for Montagu's having described and figured it (*Gammarus spinosus*) without the monodactyle hands.

DEXIA'RIÆ, a family of dipterous insects of the section *Creophilæ*, established by M. Robineau Desvoidy. The species may be distinguished from those of neighbouring groups by the greater length of their legs; the body is generally elongated and cylindrical, sometimes thick, depressed, or rounded. The fore part of the head generally exhibits a ridge situated between the deep grooves in which the antennæ are placed, and the latter are short, with the stylet mostly plumose. Males larger than the females. These flies are of inoffensive habits. They may usually be seen on flowers, the juices of which afford them nourishment. Typical genus, *Dexia*.

DEXTRINE, an isomeric modification of starch procured by boiling common starch in dilute sulphuric acid and also in some other acids; by this treatment the starch soon loses its consistence and becomes thin and limpid, being converted into *dextrine*, so called from its action on polarised light, in causing the plane of polarisation to devil ate to the right. Dextrine may also be prepared by the action of an infusion of malt kept some time at 150°. Its composition is similar to that of starch. Dumas gives as its formula C^{24} H^{10} O^{10}.

When the ebullition is continued after the formation of the dextrine, this substance is converted into grape sugar, and this effect is produced with great readiness.

DEY, the name given to the chiefs of the states of Barbary, under the sovereignty, more or less real, of the Ottoman Empire. The dignity of dey in the states of Tunis and Tripoli is not hereditary: on the death of a dey, his successor is chosen from among the highest civil and military authorities, with the concurrence of the Turkish troops stationed in each of the states. He is elected for life; but the Porte pretends to reserve to itself the right of deposing him if he does not give satisfaction.

DHALAC or DAHALAC, the largest island in the Red Sea, is situate in 15° 53′ N. lat., 40° 40′ E. long. Its extent from N.W. to S.E. is about 35, and its breadth 18 miles. Its surface, which is low and level, is covered with sand, but destitute of all herbage during the summer heat, except a small quantity of bent-grass. In many places there are large plantations of acacia trees, but they seldom attain above eight feet in height. There are no springs, and the rain water is preserved in tanks and cisterns. No kind of agriculture is carried on. The inhabitants are good seamen and fishermen. (Bruce's *Travels*, *London Geographical Journal*.)

DHAR, a small state in the province of Malwa, Hindostan. The ancestors of the Raja were originally Rajputs, but they had emigrated at an early period to the south, and had become naturalised as Mahrattas. By a treaty, Jan. 10, 1819, the state was taken under British protection, on the condition of allegiance and military service. The residence of the Raja is in the city of Dhar, 22° 35′ N. lat., 75° 20′ E. long. It is a large place, surrounded by a mud wall fortified with towers.

DIABE'TES, the discharge of a preternatural quantity of urine. It is usually divided into two species, namely, *diabetes insipidus*, when there is discharged a preternatural quantity of urine which is perfectly insipid, and *diabetes mellitus*, when the unusual quantity of urine which is voided is sweet to the taste.

The discharge of a larger quantity of urine than natural, unaltered in its chemical constitution, may arise from numerous causes of a temporary nature, scarcely deserving the name of a disease, and certainly not forming a disease of a specific character. The term diabetes should therefore be restricted to that specific disease in which the secretion of urine is preternaturally increased, and its chemical composition at the same time essentially changed.

In diabetes, properly so called, the urine is generally so clear that it appears at first sight to be entirely without colour; but, viewed in a certain light, it is seen to be slightly tinged with a yellowish green, or it is of a pale straw colour. Examined by the taste, it is almost invariably found to be more or less sweet; and, when chemically analysed, it is ascertained to contain, usually in considerable quantity, a saccharine matter, which is exactly of the nature of common sugar. Its odour likewise is peculiar; it is commonly compared to the faint odour of violets, or to that of sweet whey or milk. Its specific gravity commonly varies from 1.025 to 1.052. The principle peculiar to healthy urine, *urea*, is generally very much diminished in quantity, though the best chemists have never observed it to be altogether absent. There is however little or no lithic acid; it commonly contains the usual saline ingredients, but diminished in quantity; blood itself is sometimes, though very rarely, found in it; it far more frequently contains a considerable portion of one ingredient of the blood, albumen; though the albumen, when it exists in the urine, is in the state in which it is found in chyle rather than in blood. From a table given by Dr. Henry, it appears that ten pounds of diabetic urine, at the average specific gravity of 1.040, yields upwards of a pound and a quarter of solid extract.

The quantity of urine voided in this disease is sometimes enormous. Instances are by no means uncommon in which the quantity amounts to from 25 to 35 pounds every 24 hours for weeks or even months together. Although one of the most constant constitutional symptoms attendant on this disease is inordinate thirst, yet the urine daily voided almost always exceeds the quantity of liquids drank, and sometimes the whole of both solids and liquids.

This disease is generally of a chronic character; but it sometimes attacks in an acute form, the marked symptoms of the malady coming on suddenly in a previous state of apparent health, and proving fatal in a few days. This however is very rare. It seldom runs its course under some months, and it sometimes lasts several years. It frequently disappears for awhile, especially under proper treatment, and then recurs after the lapse of a few months or years; so that the relief obtained is commonly only temporary, the disease resuming all its severity from a slight exposure to its exciting causes, or from any considerable deviation from the proper diet and regimen. Hence it is perhaps the prevalent opinion among physicians that it is absolutely incurable. All writers on diabetes record its frequent complication with and termination in consumption; and it is rare indeed that the indications of disease in the digestive mucous surfaces and in the liver are absent. It may be in fact regarded as a disease connected with a scrofulous condition of the system. An inspection of the organs after death which has been made with great care does not throw much light on the seat and nature of diabetes.

Whatever doubt may be raised about the perfect curability of diabetes, there can be none respecting the decided control which a judicious plan of treatment is capable of exerting over its progress. Where the patient will bear it, small blood lettings have been found of advantage. It is not often however that this remedy is admissible. There are few diseases in which the proper regulation of the diet is of such vital importance. Vegetable matters, more especially sweet and acid vegetables, or those which contain in the greatest proportion the elements of sugar, are in the highest degree deleterious. Animal food should form the main portion of the diet. It need not be taken oftener than twice a day, and, of all kinds of animal food, beef-steaks or mutton-chops underdone and plainly cooked are the best. The quantity is second in importance only to the quality. The meals should not be at greater distances than five or six hours apart, and any solid food taken oftener than every three hours, however it may for the moment allay painful sensations, operates unfavourably on the progress of the disease. The best drinks are distilled water, lime-water, alum-whey, and the Bristol hot-well and Bath waters. The latter especially tend powerfully to assuage the thirst; but moderation in the use of liquids is as indispensable as in that of solids, and, unless the patient resolutely co-operate with the physician in controlling his inordinate desire for food and drink, no plan of treatment that can be devised will succeed. The bowels should be kept in a lax state. The skin also requires attention, which is often permanently improved, with a proportionate improvement in all the symptoms of the disease, by the persevering and judicious employment of the vapour bath, the hot-air bath, the sulphur bath, the vigorous use of the flesh-brush, and warm flannel clothing, always in immediate contact with the surface of the skin. As a part of the regimen, regular daily vigorous exercise in pure air is of great importance. Medicines may be given to meet particular symptoms. Opium is often found of great value.

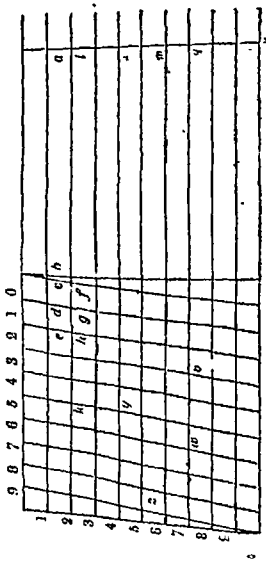
DIACOPE, a genus of fishes of the section *Acanthopterygii* and family *Percidæ*, and belonging to that section of the family in which the branchiostegous rays are less than seven, and the lateral line is interrupted. Many large and beautiful species of this genus inhabit the Indian seas.

DIADE'LPHIA, the seventeenth class in the Linnæan system of arranging plants.

DIADUMENIA'NUS, MARCUS OPE'LIUS ANTONI'NUS, was the son of Macrinus, who was proclaimed emperor by the soldiers after the murder of Caracalla, A.D. 217. After his father's elevation, Diadumenianus, who was then at Antioch, was proclaimed Cæsar by the soldiers, and confirmed by the senate at Rome. He was not quite ten years of age. The reign of Macrinus lasted only fourteen months; a military insurrection, excited by Mæsa, the aunt of Caracalla, who wished to put on the throne her grandson Bassianus, also called Heliogabalus, led to the overthrow of Macrinus, who was defeated near Antioch, and afterwards made prisoner, but killed himself. Diadumenianus, who had escaped from Antioch, was also seized and put to death, A.D. 218.

DIAGONAL, a line drawn from corner to corner.

DIAGONAL SCALE. Equidistant parallel lines cut *all* lines drawn across them into equal parts. Consequently a set of equidistant parallels laid down upon a ruler, with oblique lines of various lengths drawn across them, give with the compasses the means of immediately taking off various proportions of those lines. But the common diagonal scale is as follows, and facilitates the laying down of the hundredths of units in a scale of equal parts. A description of its use will immediately suggest the principle of it to any one



slightly acquainted with geometry. AB is the unit of the scale (usually a quarter of an inch): the diagonal scale professes to determine the hundredth part of this, or the four hundredth of an inch, and may perhaps, with care, be depended on within the two hundredth of an inch. By taking off various lines, and writing their numerical designations opposite, we may show the use and meaning of the construction.

$ab = 1{\cdot}00$	$ae = 1{\cdot}21$	$lh = 1{\cdot}22$	$mz = 1{\cdot}96$
$ac = 1{\cdot}01$	$lf = 1{\cdot}02$	$lk = 1{\cdot}52$	$qv = 1{\cdot}37$
$ad = 1{\cdot}11$	$lg = 1{\cdot}12$	$xy = 1{\cdot}54$	$qw = 1{\cdot}67$

DIA'GORAS OF MELOS, also called the Atheist, belongs to the middle part of the fifth century B.C.

Diagoras is said to have announced his atheism on seeing a man who had stolen one of his writings and published it as his own go unpunished for the crime. (Sext. 'Empir. adv. Math.,' p. 318.) On account of this atheism it is generally said that the Athenians put a price upon his head. Aristophanes in his play of the 'Clouds,' one object of which was to raise a religious outcry against Socrates, has maliciously fastened on him the odious name of the Melian. ('Clouds,' 830.)

DIAGRAM, a mathematical figure of any kind.

DIAL, an instrument for determining the hour of the day from the shadow of a point or line upon a graduated surface. The shadow may be that formed by the light of the sun or moon, either direct or reflected. The dial, when the sun is used, is called a sun-dial; and, when the moon, a moon-dial. The latter kind however, as well as those in which the light is reflected, are merely objects of scientific curiosity. [SUN-DIAL.]

DIALECT (*διάλεκτος, δια-λέγ-εσθαι, to converse*), an appellation given to a language when spoken of in contradistinction to some other language which it resembles in its general features, though differing from it more or less in the details. Almost all the languages which we are acquainted with may be arranged in distinct classes or families, and the relationship subsisting between the members is, generally speaking, pretty obvious. Sometimes the parent language from which they are all descended is still extant, and in that case it is frequently easy to trace the variations in orthography, inflexion, and conjugation from the parent stock, and to determine the principles which governed these changes. This is the case with the modern languages which are derived from the Latin. The two most widely diffused families of languages known to us are the Indian-Gothic and the Semitic; the former includes the Sanscrit, Zend, Armenian, Greek, Latin, Lithuanian, Sclavonian, Teutonic, and Celtic dialects, in which the resemblances, though sometimes rather distant, are still more or less perceptible. The Semitic family contains the Hebrew, Syriac, and Arabic tongues, with others less known to modern Orientalists. Many of these primary dialects are divided into several sub-dialects; for instance, the ancient Greek had at least three distinct dialects, the Æolian, Dorian, and Ionian.

The differences in the modes of speaking in England can hardly be called dialectical, in the sense in which the word dialect has been explained: such differences, generally speaking, are nothing more than peculiar words or phrases which the written language has not adopted, but which are not the less on that account genuine members of that Teutonic family of which the written language itself is only a part.

DIALECTIC (*διαλεκτικὴ τέχνη*), the old name for the practical part of logic. The word properly signifies 'the art of conversation,' and its use as a name for the art of reasoning seems to have arisen from the fact, that Zeno the Eleatic, who was the first compiler of a system of logic, was also the first writer of dialogues. It is also to be remembered, that formal argumentation among the Greeks was generally carried on by means of question and answer.

DIAMETER, a word most commonly applied to the line drawn through the centre of a circle, and bounded on both sides by the circumference.

DIAMOND, a crystalline gem, which, on account of its high lustre and extreme hardness, has always been regarded as the most valuable of the precious stones. The diamond usually occurs in imbedded octahedral crystals in alluvial ground, in the East Indies, Brazil, and the Ural Mountains. It is commonly colourless or grayish, but sometimes green, yellow, red, brown, blue, and black: the two last-mentioned colours are the rarest. Its lustre is adamantine; refraction single; transparent, but sometimes rendered opaque by foreign matter. It is harder than any other substance, and can be cut or worn down only by rubbing one diamond against another; and it is polished by the friction of portions of the gem itself reduced to powder. It is broken without difficulty. The specific gravity of the diamond is 3.52; streak grayish, fracture conchoidal. When rubbed, it phosphorises, and becomes positively electrical. When heated, without the contact of air, it suffers no change; but, if ignited in contact with it, it is totally converted into carbonic acid gas.

For ornamental purposes diamonds are cut into two shapes, namely, *rose diamonds* and *brilliants*. The weight and consequently the value of diamonds is estimated in carats, each of which is equal to 3.166 grains.

It was conjectured by Newton that the diamond is a combustible body; but the proof of its being absolute carbon in a crystalline form was developed by slow degrees by the Florentine Academicians in the 17th century, by Lavoisier a century later, and by many chemists in the present century.

DIAMOND, GLAZIER'S. The pencil diamond used in cutting glass is a small fractured piece of diamond. The part of the diamond used is of a trapezoidal shape, weighing about the 60th part of a carat, and is set in a wooden handle.

DIA'NA, a goddess who was worshipped in ancient Rome and Italy. Dianus and Diana are properly two adjectives, derived from *dies*, 'day,' or, perhaps, originally, 'light.' Dianus, by an easy change, would become Janus, as *Diana*, we know, was corrupted by the rustic population into Jana in their hymns to the new moon, beginning *Jana Novella.*

Diana was the patroness of the chase, and of the woods, and her aid was invoked in parturition. [ARTEMIS.]

DIA'NCHORA, a fossil genus of Conchifera, allied to Spondylus. *Dianchora striata* and *D. lata* are described by Mr. Sowerby from the chalk and greensand (*Min. Conchology of Great Britain*).

DIA'NDRIA, the second class in the Linnæan system of arranging plants. They possess two stamens.

DIANTHUS, a beautiful genus of silenaceous dicotyledonous plants. De Candolle enumerates 113 species, of which some must undoubtedly be reduced to simple varieties. They are found in all the temperate parts of Europe and Asia, from Ireland to the eastern coast of China and Japan; two have been met with in the United States of America, and four at the Cape of Good Hope. Most of them are perennial herbaceous plants with permanent leaves and stems, and hence they ought perhaps to be considered undershrubs; a few become woody and form genuine bushes.

The most remarkable species are—*D. barbatus*, or the Sweet William, a common and very beautiful hardy herbaceous plant, native of the south of Europe; *D. caryophyllus*, or the Clove Pink, so called from its spicy fragrance; in its wild state a native of France and England, in its cultivated state the parent of the Carnation, Picotee, and Pink of the florists; and *D. Libanotis*, the Syrian Pink, with the most lovely feathered petals. There are however few genera in which the species are so generally deserving of the gardener's care, for we do not know one that is otherwise than beautiful. The species are however seldom seen, in consequence of a difficulty in preserving them in a healthy state in the damp climate of Great Britain.

Although some of the species are indigenous to Great Britain, by far the greatest number are natives of the southern parts of Europe; abounding in Germany, Switzerland, Italy, and along the shores of the Mediterranean, Black and Caspian Seas, inhabiting rocks, mountains, and dry warm stony places most frequently, although occasionally living in sandy and damper places. Of our own wild kinds, *D. caryophyllus* only occurs upon old crumbling walls, others in dry gravelly places, or on limestone rocks.

All the species may be propagated either by seeds or by the same processes that are employed for the Carnation and Picotee, namely, by layering or piping. Layering is decidedly the surest method, as the young shoot derives support from the parent plant until it has protruded rootlets of its own for nourishment. In this operation, gardeners generally practise a method technically called tongueing, which is simply making a slit with a knife, from a little below the joint up through its centre, and then carefully pegging the young shoot down as in the common way. Pipings are a sort of cuttings, and will root freely in a melon or cucumber frame, which can often conveniently be applied to this purpose in the end of the season; but, as artificial heat is not essential to success, those who have not this convenience may succeed very well with a small hand-glass.

If the pipings are not in a shaded situation, it is necessary to shade them when the sun's rays are powerful; because the rootlets are for some time insufficient to supply the stem with fluid enough to counteract the effects of evaporation. It is the want of due attention to this which causes the result of propagating the Dianthus by pipings to be considered uncertain. If shade and moisture are supplied for a sufficiently long time, there is little risk of the pipings not forming young plants.

DIAPASON, in Music, the interval of the octave, so called because it includes all admitted musical sounds. It likewise signifies the compass of any voice or instrument.

DIAPENSIA'CEÆ, a very small natural order of monopetalous exogenous plants, formerly mixed with *Convolvulaceæ*, but in reality more nearly allied to *Polemoniaceæ*. Only two genera are known; they consist of small depressed half-shrubby species, with the habit of a minute-leaved *Phlox*.

DIAPER, a linen or cotton cloth, upon the face of which a figured pattern is produced by a peculiar mode of weaving. Diapers are chiefly used for table linen, fine towels, &c.

In decorative painting the term *diapering* is sometimes applied to a small pattern introduced to diminish the appearance of baldness where a considerable space is covered with one colour.

DIAPHORETICS, or SUDORIFICS, are agents which increase the natural exhalation of the skin, or restore it when suppressed. The circumstances surrounding the patient determine however the effect of these agents. When kept warm, perspiration is produced, but if exposed to a cool atmosphere their action will extend only to the kidneys, and produce an increased secretion of urine.

Their effects as diaphoretics are attempted to be accounted for by reference to two principles; 1, by increasing the action of the cutaneous vessels; 2, by increasing the vascular action of the whole system. Those diaphoretic remedies which seem to act according to the first principle produce their effect either by external application, such as the stimulus of heat, especially as proved by the hot-air bath; or as medicinal substances which enter the circulation and stimulate the cutaneous vessels by contact, such as mercurial preparations, some saline diaphoretics, and, most markedly, sulphur, which is evidently carried undecomposed to the cutaneous vessels and excreted by them; or, lastly, by acting on the surface sympathetically through the medium of the stomach, such as warm drinks, antimonial preparations, &c.

Those diaphoretic agents which seem to act according to the second principle are:—violent muscular exercise, carbonate of ammonia, guiacum, alcoholic stimulants, &c. In colds, rheumatism, fevers, and many cutaneous diseases, diaphoretics are often very useful, and in some forms of indigestion an increased action of the skin is beneficial.

It is worthy of remark, that the profuse and wasting perspirations which accompany the hectic of consumption are frequently more effectually checked by diaphoretics, especially the compound ipecacuan powder, than by any other means.

DIAPHRAGM (διάφραγμα), *septum transversum, transverse partition, Midriff*, a circular muscle, placed between the thorax and abdomen, forming a moveable partition between these two great cavities. Its borders, which are broad and fleshy, are moveable; its central portion, which is tendinous, is fixed and immoveable. When not in action, its upper surface, or that towards the thorax, is convex, presents the appearance of an arch, which reaches as high as the fourth rib, and is covered by the pleura, the membrane which lines the cavity of the thorax. It is perforated by several apertures, through which the aorta, or great artery of the trunk, passes from the thorax into the abdomen, the thoracic duct enters from the abdomen into the thorax; the œsophagus passes through it from the mouth to the stomach, and the inferior vena cava from the abdomen to the heart.

The most important office of the diaphragm is connected with the function of respiration, and it is the principal agent both in enlarging the cavity of the thorax in inspiration, and in diminishing it in expiration. These actions it performs by virtue of the power of alternate contraction and relaxation which it possesses in common with all muscles.

DIARBEKR, the capital of the Turkish Eyalet of Diarbekr, stands in 37° 55′ N. lat., 39° 51′ E. long., at a short distance from the right bank of the Tigris, and has 50,000 inhabitants. The area of the town is considerable; the walls are lofty and substantial, and surmounted by a castellated parapet. Formerly the town was inhabited by 40,000 families, and carried on a very active commerce with India, through Bagdad, and with Europe through Aleppo; but the plundering incursions of the Kurds in later times have reduced its trade very considerably. The manufactures are silk and cotton stuffs, printed calicoes and muslins, morocco leather, hardware, and pipes. British manufactures to the amount of about 25,000 dollars, and colonial produce to about 10,000 dollars annually, are imported from Aleppo, chiefly by Turkish and Christian merchants. The town contains 20 mosques, 5 Christian churches, a synagogue, 20 baths, 15 caravanserais, and a great number of bazaars, which are well supplied with goods. The neighbourhood of Diarbekr is very fertile. Scammony, tragacanth, and some other drugs, together with hare, fox, and jackal skins, are exported through Aleppo to Europe. Diarbekr is the seat of a Jacobite patriarch and a Nestorian archbishop. The Tigris is not navigable for boats so high up as Diarbekr; but rafts of timber are sometimes floated down from the mountains above the town. Diarbekr is said to occupy the site of the ancient *Amida*, which took the name of Constantia from the Emperor Constantius, who fortified it. The Turks still call it *Kara Amid*, or Black Amid, in allusion to the black basalt of which the houses and fortifications are built. (*London Geogr. Journal*, vol. vi.; Buckingham's *Travels in Mesopotamia*.)

DIARRHŒA (διάῤῥοια), flux, looseness, purging, the frequent discharge from the bowels of more liquid stools than natural. The most obvious and common cause of this disease is the direct application of some stimulating substance to the inner or mucous surface of some portion of the alimentary canal; as articles of food and drink of too stimulating a quality, or, though wholesome in kind, taken in too large a quantity. Undressed or indigestible vegetables, whether acid or sweet, cucumbers, melons, mushrooms, different kinds of salads, fruits, especially plums, stale and decayed vegetables, animal food approaching to the putrescent state, as stale fish, high game, &c., contain matters either not easily digested, or, when digested, of so stimulating a quality as to irritate the mucous surface of the intestine, and to produce diarrhœa. Water tainted with putrid vegetable or animal matters, or loaded with certain kinds of living or dead animalcules, is no uncommon cause of diarrhœa. When a great mixture of different kinds of food and drink, in large quantities, though wholesome in kind, is taken into the stomach at one meal, it often produces a sudden attack of diarrhœa. Even a draught of cold water, beer, or milk, especially if the individual be overheated at the time, will often almost immediately occasion the same result. Many medicines and poisons are substances which prove directly and powerfully irritating to the stomach and intestines. The large class of purgative medicines and the poisons called irritants are of this kind. Purgative medicines, given in a certain quantity and at certain intervals ascertained by experience, produce a certain degree of diarrhœa, which the physician purposely excites for the accomplishment of various objects. Given in very large doses, or in ordinary doses when the system is in a state of peculiar irritability, they sometimes occasion an excessive diarrhœa, which continues longer than usual, and is called hypercatharsis.

By whatever cause diarrhœa may be excited, it is seldom that the increased discharge of liquid stools from the intestines is the only symptom present. It is commonly preceded by nausea, and in general more or less uneasiness is felt in the stomach and intestines, which sometimes amounts to severe griping pain, often accompanied with flatulence. In severe cases the abdomen is distended, and even tender to the touch; the nausea passes into vomiting, and the pain, especially around the navel or in the course of the colon, becomes intense, somewhat relieved, perhaps, after each evacuation, but soon returning with undiminished severity. The number of evacuations may vary from three or four to twenty or thirty in the twenty-four hours. The tongue is loaded, and in certain forms of the disease is intensely red at the edges and tip, and the papillæ are large, prominent, and of a bright red colour, shining through a thick coat of fur. The urine is generally diminished in quantity.

The duration of this disease must of course be

materially influenced by the persistence of the cause that excites it. Its ordinary varieties, being generally dependent on temporary causes, are of short duration; but the increased secretion of bile by the liver, and of mucus by the mucous follicles, and the irritation of the intestinal canal from dentition, may be protracted to an indefinite period; and the disease dependent on the excited state of these organs may consequently become chronic, continuing for months together to harass the patient and enfeeble the constitution.

The immediate danger from a very severe attack of diarrhœa, or from its passing from the acute into the chronic state is, that it should terminate in acute inflammation of the bowels (enteritis); or chronic inflammation and ulceration of the bowels (dysentery); or intus-susception (the passing of one convolution of the intestines into another), induced by the increased peristaltic action of the bowels; or enlargement, hardening, and obstruction of the mesenteric glands, and the consequent wasting of the body (marasmus), one of the most common forms of disease by which the existence of infants and children is cut short.

Though diarrhœa is often a trifling disease, and even a remedial means adopted by nature to prevent the occurrence of more serious evils, it is yet apt to terminate in dangerous and fatal maladies, and their management requires great and persevering care. Instances are by no means unfrequent in which the ultimate event proves fatal, in consequence of their neglect, or of the medical treatment and the remedies being injudicious. Indeed the treatment of diarrhœa in general requires much discrimination, for a very trifling form of it is easily converted by mismanagement into a highly dangerous disease. The chief difficulty is to detect the exact nature of the exciting cause, and the exact condition of the excited organ, which alone can guide to the selection of one of two opposite plans of treatment, the administration of purgative or opiate medicines. If the irritation arise from too large a quantity of stimulating food and drink, abstinence alone is sufficient to effect a cure; but if, notwithstanding the abstinence from food, the disease continue, it is necessary to ascertain whether the irritation be kept up by the retention of irritating matters, or whether the alimentary canal itself be in a preternaturally irritable and excited state. If the former, purgative medicine of some kind or other is indispensable. For this purpose castor oil is one of the best medicines. It is often attended with the best effects to combine a few drops of laudanum with the aperient. When the irritating contents of the stomach and intestines are removed, a mild and frequently repeated sedative should be prescribed.

DIARY, from the Latin *Diarium*, which is from *Dies*, a day. The original and proper meaning of the word *Diarium* among the Romans was the daily allowance made to slaves for their sustenance, as *Menstruum* was their monthly allowance. *Diurnum* was another word for the same thing. [Acta Diurna.] In later times however both words are used for a note-book, or other register of daily occurrences. It is only in the sense of a daily register that the word diary is used in English. A diary is etymologically the same thing with a day-book or journal; the latter word being a modernised form of diurnum, as diary is of the synonymous diarium of the same parentage. The French language has only the form *journal*; the Italian, like the English, has both forms, *diario* from *diarium*, *giornale* from *diurnum*, both ultimately from *dies*.

DIASPORE occurs massive and crystallised. Primary form a doubly oblique prism. Colour slightly greenish gray and yellowish brown. Hardness, 6.0 to 6.5. Specific gravity, 3.48. Found at Kosoibrod in the Orenburg government of Asiatic Russia. Alumina, 76.06; water, 14.70; oxide of iron, 7.78; loss, 1.46.

DIASTASE, a substance formed during germination. It is prepared by reducing freshly germinated barley into a pulp, with half its weight of water, and then pressing out the liquor strongly. It is afterwards treated repeatedly with alcohol, purified, and precipitated. The precipitate is at last to be dried in thin layers upon glass at a temperature between 104° and 122° F. Diastase is solid, white, not crystalline, soluble in water, but insoluble in alcohol unless it be weak. Common malt is stated in general not to contain more than 1-500th of its weight of diastase; one part of it is sufficient to convert 2000 parts of starch, thickened with water, into a mixture consisting of much dextrine and a little sugar. It has not yet been obtained absolutely pure.

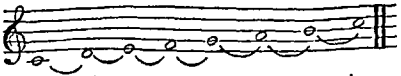
DIASTYLIS, a genus of Crustaceans established by M. Say.

Generic Character. — Four antennæ placed nearly on the same line; the intermediate antennæ bifid, having a peduncle of three joints, the external simple, with the first joint long, and without a scale. External jaw-feet very large, pediform, very much approximated to the front, with the first joint long and compressed, and the others very small, cylindrical, and nearly equal. Corselet smooth, of six segments, of which the first, larger than all the others together, is terminated anteriorly by a short, obtuse, triangular rostrum, crenelated on its lateral edges. Six pairs of bifid feet; those of the first pair truncated at the end and shorter than the external jaw-feet; those of the second terminated in a point; those of the third, fourth, and fifth pairs raised, pointed, without a nail, and terminated by strong hairs. Abdomen narrower than the thorax, formed of six segments, the two last of which support the natatory feet. Tail biarticulated, provided on each side of the first segment with a single bifid style, and on the extremity of the second with a simple cylindrical style.

Example, *Diastylis arenarius*. Length one-fifth of an inch. Locality, the coasts of Georgia and Florida.

M. Say is of opinion that the *Cancer scorpioides* of Montagu, from the English coasts, and the *Cancer esca* of Gmelin, from those of Norway, ought to be referred to this genus.

DIATON'IC, a name applied to a particular arrangement of musical tones in an octave. [Scale.] The following is the *Major Diatonic Scale*:—



DIBDIN, CHARLES, was born at Southampton in 1745. He was educated at Winchester, and originally designed for the clerical profession, but his love for music predominated, and after receiving some instruction from the celebrated Kent, organist of Winchester Cathedral, he was sent to London, and commenced his career, as poet and musician, at the early age of sixteen, when he produced an opera at Covent Garden Theatre, written and composed by himself, called 'The Shepherd's Artifice.' A few years after, he appeared as an actor, and was, in 1768, the original Mungo in his own 'Padlock.' About the year 1782 he built the Circus Theatre (afterwards opened under the name of the Surrey), which continued under his management about three or four years. In 1788 he published his 'Musical Tour,' in one vol. 4to., and in 1789 presented to the public, at Hutchins's auction rooms, King Street, Covent Garden, the first of those entertainments of which he was sole author, composer, and performer, under the title of 'The Whim of the Moment.' In this, among sixteen other songs, was the ballad 'Poor Jack,' an effusion of genius that immediately established his reputation, both as a lyric poet and melodist. Dibdin continued this sort of career till 1805, when he retired from public life, very ill provided for, and a pension of 200*l.* a year was bestowed upon him by the government. In 1813 he was attacked by paralysis, and died in the July following. Mr. Dibdin published one or two novels, and some smaller works; but his fame is built on his songs, of which —so prolific was his muse, and so great his facility in composition—he produced the amazing number of nine hundred! They are chiefly naval, and the popularity they deservedly obtained during the war with France has been maintained by their intrinsic excellence ever since.

DIBDIN, THOMAS, one of the sons of Charles Dibdin, was born in 1771. At an early age he attached himself to the stage, with which as actor or author he continued connected till his death in 1841. His comedies, operas, and farces are numerous enough to fill a long paragraph with their bare names. Many of them were composed for temporary purposes; and many others had little or no success. But there are some which still appear occasionally on the stage. Such are the opera of 'The Cabinet,' and the farce of 'Past Ten o'Clock.'

DICÆARCHUS, the son of Phidias, was born in Messána in Sicily. He was a scholar of Aristotle, and is called a peripatetic philosopher by Cicero. But the chief performance of Dicæarchus was a treatise on the geography, politics, and manners of Greece, which he called 'The Life of Greece' (Ἑλλάδος Βίος). Of this a fragment has come down to us, which is printed in Hudson's 'Geographici Minores,' and also edited by Marx in Creuzer's 'Meletemata e Discipl. Antiquitatis,' p. iii. p. 174. The maps of Dicæarchus were extant in the time of Cicero ('Ep. ad Att.,' vi. 2); but his geography was not much to be depended upon. (Strabo, p. 104.)

DI'CERAS, a fossil genus of Conchifera, allied in form to Chama. It includes species mostly occurring in the upper part of the oolitic strata and (*D. Lonsdalii*) the lower part of the greensand.

DICHO'TOMY, a term in Botany, employed to express a mode of branching by constant forking. The first stem or vein of a plant divides into two branches, each branch divides into two others, and so on. It is only in the veins of fern leaves, and of those of some coniferous species, and in the stems of lycopodiaceous plants, that this mode of division exists as a general character. It however does occur elsewhere; for example, the Doom Palm of Thebes is remarkable for its dichotomous branches, and the Screw Pines have a similar habit.

DICHROISM, from the Greek words δίς (double) and χρόα (colour), is a term applied to that property of certain crystals by which they exhibit different colours according to the position of their axes with respect to the incident pencil of light.

Some of the phenomena relating to the differences of colour in a crystal were observed by Dr. Wollaston in tourmaline and some other minerals, but Dr. (Sir David) Brewster was the first to discover that they were caused by the different absorptions of the rays of coloured light in their passage through the crystal. In the undulatory theory they depend on some modifications of those functions of the lengths of waves by which the tints of colour are expressed.

DICHROITE (*Iolite, Peliome, Steinheilite, Cordierite*) occurs massive and crystallised. Primary form a right rhombic prism. Colour blue in direction of the axis, and yellowish gray perpendicular to it; sometimes dull yellowish in both directions. Hardness, 7.0 to 7.8. Transparent, translucent. Specific gravity, 2.56. Massive varieties amorphous. Structure indistinctly granular. Found at Cape de Gatte in Spain, in Greenland, in Bavaria, Norway, the United States, &c. Silica, 50.24; alumina, 33.42; magnesia, 10.84; protoxide of iron, 4.00; protoxide of manganese, 0.68; water, 1.66.

DICOTYLE'DONS, a natural class of plants, deriving their name from the embryo having in general two seed-leaves or cotyledons; a character to which there are however some exceptions. The stems of dicotyledons are in most cases branched. They have the pith, wood, and bark distinctly separated, and the wood traversed by medullary rays. This wood, if more than one year old, consists of concentric circles, each of which is formed on the outside of that which immediately preceded it. The leaves of dicotyledons are articulated with the stem, so that at a particular time they are thrown off, and leave a clean scar behind them, as in all the trees, whether deciduous or others, which are found in the open air in England. Their veins are repeatedly branched, so as to form a netted apparatus within the parenchyma. The number of parts in the flower of dicotyledonous plants is four or five; that is, four or five sepals, four or five petals, and the same number of stamens, present in either

a complete or imperfect state; or, if the number is greater, it is some power of four or five. When the seeds germinate, the embryo simply extends the points of its radicle in the form of a root, to seek for nourishment in the soil.

DICTAMNUS. [FRAXINELLA.]

DICTATOR was the highest extraordinary magistrate in the Roman republic. Though the name obviously contains the element *dic* (from *dico*), it was doubted by the Roman writers whether the title had reference to the mode of his nomination or to his power. He was also called by the old name of Magister Populi, and in Greek δικτάτωρ, or 'double consul.' After the expulsion of the kings the consulship was established. The two consuls possessed the same power as the kings in the administration of the state and the command of the army; yet their authority was subject to some restrictions, and principally by the appeal that could be made from their decisions. The two consuls, possessing equal authority, often differed in their views and opinions; a circumstance which often caused jealousy and disunion. In extraordinary emergencies, the republic therefore required a single magistrate. Such circumstances led to the establishment of the dictatorship. The first dictator was created about the year 253 A.U.C., or 501 B.C. (Liv., ii. 18.)

The dictator had the power of the two consuls; and the authority of all other magistrates, except that of the tribunes, ceased as soon as he was appointed. He possessed the whole administrative power of the state, and the command of the army without any restrictions. He had the power of life and death, and there was no appeal from his decision. Both within and without the city he was attended by twenty-four lictors, with their fasces and axes. After his election, the dictator nominated the master of horse (magister equitum), who commanded under him. Generally it was only when the state was menaced by sudden danger that a dictator was nominated. The dictator continued in office for six months, but he commonly resigned as soon as the danger was over which had led to the nomination. The rule that he should continue in office only six months was neglected: Sulla and Julius Cæsar were nominated perpetual dictators, the former in the year 81 B.C., and the other after his victory at Pharsalus. Augustus declined the office, though offered to him by the people (Suetonius, 'Aug.,' 52), and the title of dictator was never assumed by the emperors of Rome.

According to Niebuhr, the dictatorship was of Latin origin, and was introduced from the Latins among the Romans. The object of the Roman dictatorship was to evade the Valerian laws, and to establish the power of the patricians over the plebeians; for the appeal granted by those laws was from the sentence of the consuls, and not from that of the dictator. The later Romans had but an indistinct knowledge of the dictatorship of the ancient constitution. Dion Cassius is in error, when (without excepting the patricians), he asserts that in no instance was there a right of appeal from the dictator. Dionysius is also in error, when he says that the dictator decided on every measure according to his own pleasure. It is incorrect to suppose that the appointment of the dictator in all cases rested with one of the consuls; for the conferring of kingly power (such as that of the dictator was) could never have been intrusted to a single person. The pontifical books have preserved so much as this, that the dictator was nominated by the senate, and that the nomination was approved by the people. As the plebeians increased in power, the dictatorship was seldom required, and then only for matters of less importance; and in such cases the nomination was left to the consuls.

For a general sketch of the dictatorial power, the reader may consult Creuzer, *Abriss der Römischen Antiquitaten, &c.*, Leipzig, 1824; Niebuhr's chapter *on the Dictator*, and his *Remarks on the Relationship of the Dictator and the Master of the Horse*, vol. i. Engl. Trans.

DICTE, MOUNT. [CANDIA.]

DICTIONARY, the English form of *Dictionarium*, a word of modern Latinity, which from its etymology should signify properly a book of phrases or modes of expression. The term however has been generally applied to any work which professes to communicate information on an entire subject, or entire branch of a subject, under words or heads digested in the order of the alphabet. This alphabetical arrangement appears to be the distinctive peculiarity of a dictionary; but, to constitute the work a dictionary, it should seem that there must also be attached to each of the terms so arranged some explanation or interpretation. Thus, an index, in which words or titles are merely put down in alphabetical order, with nothing more than a reference to some page or passage appended to each, is not a dictionary. Again, a dictionary, however arbitrary or artificial may be the order in which its parts are distributed, must profess some unity and completeness of design. It must profess, as has been said, to go over a whole subject, or field of knowledge, of greater or less extent. Thus a mere list of miscellaneous particulars, even with explanatory remarks or comments annexed, is not a dictionary, but a catalogue. A collection of plays or of pamphlets might be arranged in the order of the alphabet, but would not on that account make a dictionary. That name is not applicable, and is never given, even to the most extensive enumeration and account of things which are merely brought together, without constituting when collected a natural system or complete body of knowledge.

Within the limitations noted, the term dictionary is applied to works on all kinds of subjects, and with every diversity of object. Dictionaries have sometimes been divided into three classes or descriptions:—1. Dictionaries of words. 2. Dictionaries of facts. 3. Dictionaries of things. And, although objections may be made to the principle of this distribution (as has been done by D'Alembert in the 'Encyclopédie,' article 'Dictionnaire'), it is sufficiently convenient for practical purposes.

1. *Dictionaries of Words.*—This is the original application of the word dictionary, and the

sense in which it is commonly understood when it stands alone. It answers in this sense to the Greek Lexicon, and although etymologically that term, like the term dictionary, ought perhaps to signify a book of phrases or modes of expression, yet among the Greeks it seems rather to have denoted a book that explains words. A dictionary or lexicon indeed usually combines an explanation of phrases with an explanation of single words. When it contains nothing beyond an explanation or translation of single words, it is generally called a vocabulary or word book. A glossary, in Latin *glossarium*, which is used by the later classics, from the Greek *glossa* (γλῶσσα), 'a tongue' or 'language,' is generally understood to mean an explanation, more or less diffuse, of terms of unusual occurrence. Some dictionaries and vocabularies apply only to some particular author or work; such as Damm's Lexicons of Homer and Pindar, since combined into the 'Lexicon Homerico-Pindaricum,' the 'Lexicon Ciceronianum' of Marius Nizolius, and others. Some modern writers have been very well illustrated in this way, as for instance, by Mr. Tyrwhitt, in his Glossary to Chaucer, and by Archdeacon Nares, in his Glossary to Shakspere and his Contemporaries, 4to., London, 1822.

2. *Dictionaries of Facts.*—This class comprehends dictionaries of history, biography, mythology, geography, archæology, and all others that deal chiefly or exclusively with events that have happened, or are supposed to have happened, or with facts that exist or have existed. Some of the old Greek lexicons were dictionaries of facts as well as of words; the lexicon of Suidas, for instance, is in the greater part made up of fragments of biography, history, and geography, and often contains large extracts from various writers, both extant and lost. The work of Stephanus Byzantinus, sometimes entitled, 'Εθνικὰ (the 'Ethnology') more commonly Περὶ Πόλεων (the 'Book of Cities'), is chiefly a geographical and archæological dictionary, and is the oldest compilation of that description that exists. Its meagre details under each head assimilate it in some respect to an imperfect gazetteer. In modern times the number of dictionaries that have appeared, professing to present a view of a more or less extensive field of facts, has been very great. Besides the various historical, biographical, and geographical dictionaries, general and particular, and the bibliographical dictionaries, there are dictionaries of antiquities, of architecture, of heraldry, of painting, of music, of botany, of law, of legal decisions, of commerce, of medicine, of surgery, and of almost every other department of human knowledge. But knowledge, in almost all its departments, is such a mixture of ascertained facts and of mere opinions and speculations, that there is hardly any of these dictionaries which is a dictionary of facts merely. Opinions indeed, considered historically, are themselves facts, and as such ought to be recorded and arranged in dictionaries as well as other facts. Discussion also often places doubtful facts in a clearer light, and a dictionary may be as convenient a vehicle for such discussion as any other book.

3. *Dictionaries of Things.*—This division comprehends dictionaries of all the abstract sciences, the mixed or applied sciences, the departments of criticism and the fine arts, and the whole range of metaphysical and moral speculation. It is true that some of these subjects cannot be treated of without a reference to facts; but the facts here are not viewed simply as such, but either as subordinate to principles or as modifying their operation. No very rigorous adherence to the limits of a definition however is to be expected in a dictionary of any kind, which must in all cases be a somewhat unsystematic performance, and accordingly we have few, if any, dictionaries which are exclusively dictionaries of things in the sense that has just been explained. Many of the dictionaries referred to under the last head are dictionaries of things as well as of facts; that is to say, they contain, mixed up with their statements of facts, expositions or discussions of principles. On the other hand, dictionaries of things are generally also dictionaries of facts, and sometimes lexicons or dictionaries of words and phrases, in addition. The most important works of this description have been published under the title of Dictionaries of the Arts and Sciences, or Encyclopædias. By the word Encyclopædia the Greeks seem to have understood the whole circle of learning or of the liberal arts, or instruction therein, the term being so applied under the notion that all the departments of human knowledge were naturally connected together so as to form a sort of circle or complete system.

But it does not appear that the term Encyclopædia was ever anciently used to express a work which treats of all the various kinds of knowledge. It has however become the common title for such works in modern times. The earliest work that bears a resemblance to the modern encyclopædia is the 'Lexicon Universale Historico-Geographico-Chronologico-Poetico-Philologicum' of Joh. Jac. Hofman, first published at Basel, in 2 vols. fol., 1677, and followed by a 'Continuatio,' or 'Supplement,' of the same extent, in 1683; or the two publications incorporated in 4 vols. fol., Lug. Bat., 1698. The form at least of this work has been generally preserved in our more recent encyclopædias and dictionaries of the arts and sciences, although most of them, by including the principles of science as well as facts, have extended their scope somewhat beyond Hofman's design. His two supplementary volumes however embody a great deal of the natural science of his time; and the work altogether contains much curious learning not readily found elsewhere. Although not evidencing any very superior sagacity, penetration, or elegance of scholarship, it is a wonderful performance for an individual, and still remains a most useful book of reference.

The first English 'Universal Dictionary of the Arts and Sciences' was the 'Lexicon Technicum' of Dr. John Harris, of which the first volume, in fol., appeared at London, in 1706, and the second, completing the work, in 1710. It was afterwards extended to three volumes. Harrison's Lexicon passed through five editions in about thirty years,

and in the mathematical and physical department especially it is admitted to have been very ably executed. It was not long however before it found a rival in Chambers's 'Cyclopædia,' the first edition of which appeared in 2 vols. fol., in 1728. [CHAMBERS, EPHRAIM.] The professed peculiarity of the new work was that it proposed to 'consider the several matters not only in themselves, but relatively, or as they respect each other; both to treat them as so many wholes, and as so many parts of some greater whole.' This was attempted to be done by a system of references from one article to another, so as to connect the subordinate particulars among themselves, and to indicate the great division of knowledge to which each belonged. In this way the work, which in the seventh edition (1778—85) was extended to 4 vols. folio, contained no complete treatises on any of the sciences, nor other articles of any considerable length. Various other works followed, compiled upon much the same plan. (See, for an account of all these works, the preface to the 'Supplement' to the 'Encyclopædia Britannica.') The first edition of the 'Encyclopædia Britannica,' in 3 vols. 4to., appeared at Edinburgh in 1771. Since that time various editions of the same work, and other encyclopædias, have appeared in Great Britain. The most recent of all is the 'Penny Cyclopædia,' which was completed in Dec. 1843, and two supplementary volumes were added in 1846.

Of the foreign works of this class the most celebrated is the 'Encyclopédie, ou Dictionnaire Raisonné des Sciences, des Arts, et des Métiers,' of Diderot and D'Alembert, of which the first volume, fol., was published at Paris in 1751; the seventeenth and last of the original series, in 1765, eleven volumes of plates being added to the text, of which the first was published in 1762, the last in 1772. A supplement was afterwards added, consisting of four volumes of text and one of plates, fol., 1776-7; and there is besides a 'Table Analytique' of the whole work, compiled by M. Mouchon, in 2 vols. fol., Paris and Amsterdam, 1780. Editions of the work have also been printed in France and other parts of the Continent, both in 4to. and 8vo. It has been followed in France by another dictionary of arts and sciences of still greater extent, the 'Encyclopédie Méthodique,' begun in 1782, and finished in 1832, in 201 vols. 4to., including 47 vols. of plates. In this last-mentioned work every art or science is treated of in a separate volume, or series of volumes, so that the whole is in fact merely a collection of dictionaries. Of other foreign encyclopædias we may notice the German 'Conversations Lexikon' (as it was originally entitled), projected by Mr. Brockhaus, the bookseller of Leipzig, and first published there in 1812. A ninth edition of this work appeared at Leipzig in 1843-8, under the altered title of 'Allgemeine Deutsche Real-Encyclopädie für die Gebildeten Stände.' An English translation of the seventh edition, including much additional matter, appeared at Philadelphia, under the title of the 'American Encyclopædia;' and the American work is at present in course of republication at Glasgow, with additions and alterations. There is also now in course of publication the great work conducted by Professors Ersch and Gruber, entitled 'Allgemeine Encyclopädie der Wissenschaften und Kunste,' which began to be published at Leipzig in 1818, in 4to., and which is still unfinished. Some account of the encyclopædias in various languages, but neither very clearly nor very accurately drawn up, and mixed with a great deal of superfluous and useless matter, may be found in a little book called 'Nouveau Système Bibliographique mis en usage pour la Connaissance des Encyclopédies,' &c., 12mo., Paris, 1821.

DICTY'OCHA, a genus of fossil Infusoria, from the Polierschiefer of Oran.

DICTYOPHY'LLUM, a genus of fossil plants, proposed by Lindley and Hutton ('Fossil Flora') to include a large specimen (*D. crassinervium*) from the new red sandstone of Liverpool, and a more delicate species (*D. rugosum*) from the oolitic shales of the Yorkshire coast. The latter is regarded as a fern by later writers. Its nervures are rudely reticulated.

DICTYS, a Cretan who accompanied Idoméneus to the siege of Troy, and the reputed author of a history of the Trojan war, of which a Latin prose translation is extant. This work was discovered in the reign of Nero, in a tomb near Gnossus, which was laid open by an earthquake. It was written in Phœnician characters, and translated into Greek by one Eufraxidas, or Fraxis, at the command of Nero; but the Latin version which we possess is attributed to Quintus Septimius, who lived in the 3rd or 4th century A.D., and contains the first five books, with an abridgment of the remainder. There is an edition by Perizonius (1702, 8vo.), and by A. Dederich, 1833.

DICYPELLIUM, a genus of plants belonging to the natural order *Lauraceæ*. *D. caryophyllatum*, Bois de Rose, is a tree, and a native of the woods of Brazil and Guiana. It is the *Licaria Guianensis* of Aublet. The bark gives out a smell like cloves, and has a hot, clove-like, peppery taste. It is used as a medicine by the natives in the countries where it grows, and possesses powerful tonic properties.

DIDEROT, DENYS, was born at Langres in the province of Champagne, in 1713. He was placed first in the Jesuits' College at Langres, and afterwards sent to the College d'Harcourt at Paris. Diderot made some progress in the ancient and modern languages, and still more in mathematics. On leaving college, his father wished him to study the law, but Diderot had no taste for the profession, and neglected its study, notwithstanding the urgent endeavours of his father to induce him, carried so far as to stop the supplies. He employed all his time in reading discursively, and occasionally writing for those who would employ him, as he undertook any thing that came in his way, advertisements, indexes, catalogues, and even sermons for the colonies, which were bespoken and paid for by a missionary. He next began translating from the English for the booksellers. He also received indirectly assistance

from home. At the age of 29 he married a young woman as poor as himself. In his drama 'Le Père de Famille' he has drawn from life some of the incidents of his courtship and marriage. His first original work was the 'Pensées Philosophiques,' 1746, which met with great success among the partisans of the new philosophy, as it was then called. From that time Diderot ranked as one of the most strenuous assailants of the established systems in religion and politics. In 1749 he published the 'Lettres sur les Aveugles,' for which he was imprisoned for three months at Vincennes. After editing, in company with others, a Universal Medical Dictionary, Diderot formed the project of a general Cyclopædia, under the title of 'Encyclopédie, ou Dictionnaire Raisonné des Sciences, des Arts, et des Métiers.' Diderot and D'Alembert were joint editors, but D'Alembert withdrew after a time, and Diderot remained sole editor. The work began to appear in 1751, and was concluded in 1765, in 17 vols. folio, besides 11 vols. of plates. The publication was stopped two or three times by the government, and the last volumes were distributed privately, though the king himself was one of the purchasers.

The works of Diderot are numerous, and many of them were not published till after his death. A collection of his principal works was published by his disciple Naigeon, in 15 vols. 8vo., 1798, and reprinted since in 22 vols. 8vo., Paris, 1821, with a life of the author by Naigeon himself.

Diderot had not grown rich by his literary labours; he was getting old, and he thought of selling his library. Catherine of Russia, hearing of his intention, purchased it at its full value, and settled upon him a handsome pension as librarian to keep it for her, of which pension she paid him fifty years in advance in ready money. Full of gratitude, Diderot resolved to go and thank his benefactress in person at Petersburg. After a short stay he returned to Paris, but he enjoyed his good fortune only a few days. He became exceedingly weak, and felt that his end was approaching; but his mind was not at all affected, and he expired without a struggle as he sat down to dinner with his wife on July 30, 1784. Diderot was one of the principal members of the Holbach coterie, and the leader of that knot of literary men known in the last century by the name of Encyclopédistes. There are many particulars concerning Diderot in his friend Grimm's *Correspondence Littéraire*, Paris, 1812.

DIDIER, ST. [Loire, Haute.]

DIDIUS JULIA'NUS, grandson of Salvius Julianus, a celebrated jurist, was born about A.D. 133. He was educated by Domitia Lucilla, the mother of Marcus Aurelius. He soon rose to important offices, was successively Quæstor, Prætor, and Governor of Belgic Gaul, and, having defeated the Chauci, he obtained the consulship. He was afterwards sent as governor to Dalmatia, and next to Germania Inferior. Under Commodus, he was governor of Bithynia: on his return to Rome, he lived in luxury and debauchery, being enormously rich. After the murder of Pertinax, A.D. 193, the Prætorian soldiers having put up the empire to auction, Didius bid highest, and was proclaimed emperor by the soldiers. The senate with its usual servility acknowledged him emperor, but the people openly showed their dissatisfaction. He is said to have behaved with great moderation during his short reign. Three generals, Pescennius Niger, who commanded in the east, Septimius Severus in Illyricum, and Claudius Albinus in Britain, refused to acknowledge Didius. Severus, being proclaimed Augustus by his troops, marched upon Rome: the Prætorians forsook Didius, and the Senate pronounced his abdication, and proclaimed Severus emperor. A party of soldiers made their way into the palace, and cut off the head of Didius. He reigned sixty-six days. (Spartianus in *Historia Augusta*; Dion, *Epitome*, B. 73.)

DIDO. [Æneas; Carthage.]

DIDYMIUM is a metal recently discovered in cerité. Cerite eventually yields, by treatment with sulphuric acid, large red crystals, which are sulphite of didymium, from which, by treatment with potash and exposure to a red heat, the oxide of didymium is obtained in small lumps of a brown or blackish colour; the powder is light brown. It has no alkaline reaction, and is dissolved pretty readily even by dilute acids, and they yield salts of an amethystine red colour. By the blowpipe the oxide mixed with the salt of phosphorus becomes amethystine red with a tint of violet; when heated with carbonate of soda or platina foil, it melts into a grayish white mass. It does not appear to have been reduced to the metallic state.

DI'DYMUS, a celebrated grammarian, the son of a seller of fish at Alexandria, was born in the consulship of Antonius and Cicero, B.C. 63, and lived in the time of Augustus. Macrobius calls him the greatest grammarian of his own or any other time. ('Saturn.,' v. 22.) According to Athenæus he published 3500 volumes; but, to judge from the specimens of his writings given by Athenæus, we need not regret the loss of them. The 'Scholia Minora' on Homer have been attributed to him, but wrongly, for Didymus himself is quoted in those notes.

DIDYNA'MIA, the fourteenth class of the Linnæan system of arranging plants. It is the same as *Tetrandria*; that is, it has always four stamens, but two of them are a little longer than the other two. It is divided into two orders, *Angiospermia* and *Gymnospermia*.

DIE. [Drome.]

DIE, ST. [Vosges.]

DIE-SINKING. In the preparation of coined money and of medals the most important feature is the engraving of the 'die' which is to form the stamp. The piece of steel is prepared with the utmost care, and is brought to a soft state when about to be submitted to the hands of the engraver. By the aid of small, fine, hardened steel tools, the engraver cuts away the steel until he has produced, in cavity or 'intaglio,' an exact reverse of the design for the medal or coin. The steel, in a soft state while being engraved, requires hardening before being applied to use. When further prepared, so as to be rendered more durable, it obtains the name of the *matrix*,

and might be used in that state to stamp coins or medals; but as such a matrix is very costly, and might be spoiled by fracture, arrangements are made for producing multiplied copies of it. A small block of soft steel is, by immense pressure, made to receive an impress, *in relief*, from this matrix; and from this second piece, which obtains the name of the *puncheon*, after being hardened and retouched by the graver, *dies* or duplications of the original matrix are produced. In the use of dies by means of the stamping-press, the number of blows required to transfer the device to a blank piece of metal depends upon the depth of the intaglio.

A method is sometimes adopted of producing medals from a die by means of stamping upon metal which is in a semi-liquid instead of a cold and solid state; the method is called *en cliché*, and has been much practised in France.

DIEFFENBACH, JOHANN FRIEDRICH, professor of medicine in the university of Berlin, was born at Königsberg, in 1794. He was educated at the gymnasium at Rostock, and in 1812 commenced the study of theology as a profession. But the exciting times in which he lived induced him to enter the army, and he fought in the war of liberation, and was present as a private soldier in the battle of Waterloo. After the peace he commenced the study of the law; but from some disagreement with his teachers he relinquished the study of the law, and in 1816 adopted that of medicine, which profession he studied at Königsberg, Bonn, and Würzburg. His early difficulties were very great, but his energy and talent at last brought him into notice at Berlin, where he was appointed to many important medical offices, and in 1832 he was made professor of medicine in the university. His contributions to the literature of medicine were very numerous and all characterised by their practical value as well as by sound logic. Though he practised all parts of his profession, it was more especially as a surgeon that he succeeded. He was an admirable anatomist, and as to the result a bold and successful operator.

His name must ever be gratefully connected in the history of surgery with the operation of dividing the muscles in cases of deformity. By means of this operation, squinting, club-foot, club-hand, and various other deformities of the human body can be removed. The world is indebted to Dieffenbach for a knowledge of the principles on which these diseases can now be effectually removed. He died suddenly, just after delivering one of his lectures, on the 11th of November, 1847.

DIEFFENBA'CHIA, a genus of plants belonging to the natural order *Araceæ*, to which the *Caladium Seguinum*, Dumb Cane, belongs. [CALADIUM.]

DIEMEN'S LAND, VAN. [TASMANIA.]

DIEPENBECK, ABRAHAM VAN, a Dutch painter, was born at Hertogenbosch (Bois-le-Duc) about 1607. He was a scholar of Rubens, and fellow pupil of Vandyck. He was one of the best of Rubens' scholars, especially in composition and in colour. In 1641 he was elected director of the academy at Antwerp, an office which he held until his death in 1675. The date of his birth is uncertain: it is given by Descamps in 1607, but was probably earlier.

Diepenbeck came to England in the time of Charles I., and was employed by William Cavendish, duke of Newcastle, to make the pictures for his book on horsemanship.

Diepenbeck's works are very numerous. Heinecken has given a long list of the engravings after them in his Dictionary. One of his principal works is a series of fifty-nine designs, published in 1655 at Paris, under the title of 'Tableaux du Temple des Muses,' with illustrated letter-press by the Abbé Marolles, and the engravings are executed by Bloemart, Matham, and other eminent engravers.

His oil paintings on canvas are scarce: some pass probably as the works of Rubens; but there are still many of his painted windows in the churches of Antwerp. Houbraken says Diepenbeck was the best painter on glass of his time.

DIEPPE, a sea-port and bathing town in the department of Seinet-Inférieure in France, is situated on the south coast of the English Channel, at the mouth of a small river formed by the junction of the Arques, the Béthune, and the Eaulne, in 49° 56′ N. lat., and 1° 5′ E. long., and has 16,443 inhabitants. The town is 34 miles N. from Rouen, to which there is a railroad now in course of construction.

The town extends about a mile along the coast, having the harbour at the north-east end, and the castle, which stands on a tall chalk cliff and commands the town and the harbour, to the westward. The town is regularly built; the streets are wide, and well paved with round stones; the houses are picturesque, built of brick and stone, with high slanting roofs. There are six *places* or squares and two interesting churches, St.-Jacques and St.-Remi. There are at Dieppe a public library, a theatre, assembly-rooms, and a splendid bathing establishment; 68 fountains adorn the streets, which are supplied by an aqueduct three miles long. The castle is an irregular pile of considerable extent. The town walls are yet standing, but Dieppe is not a fortress. The port which is formed by two jetties, and defended by the castle, is sufficiently large and secure, but the entrance is narrow; it admits vessels of 600 tons. There is a lighthouse on the western jetty.

The population of the suburb of Pollet, to the east of the town, are all engaged in the herring, oyster, and cod fisheries. The quantity of herrings cured has in some years amounted to 36,000 barrels, and of mackerel to 12,000 barrels. There are sugar-refineries, rope-walks, paper-mills, and ship-building yards in the town. Fine linen, lace, and articles of ornament in bone, horn, shellwork, and ivory, are made. Wine, brandy, vinegar, salt, nails, iron, steel, millstones, colonial produce also enter into the commerce of the town. The coasting trade is active.

Dieppe has tribunals of first instance and of commerce, a chamber of commerce, a college, and a school of navigation. It was till lately a

favourite landing-place with tourists between France and England; but it is now surpassed in this respect by Boulogne. In 1846 the number of persons who passed through the town between England and France was 13,151; in 1847, the number fell to 4705. The railroad now in course of completion however will, no doubt, restore a share of this source of profit to the town. The most interesting places in the neighbourhood are an ancient camp attributed to Cæsar, and now called La Cité des Limes, and the ruins of the Castle of Arques, near which Henri IV. defeated the Duke of Mayenne.

DIERVILLA, a genus of caprifoliaceous plants, consisting of a single North American species, by Linnæus considered a honeysuckle, and called Lonicera Diervilla. *D. Tournefortii*, or, as it is also called, *D. humilis*, *D. lutea*, or *D. Canadensis*, is a common hardy shrub, growing from two to three feet high, in a spreading manner. It is found wild in rocky woods in the United States, from Canada to Carolina, flowering in June.

DIEST. [Brabant, South.]

DIET. [Food.]

DIETRICH, JOHANN WILHELM ERNST, a German painter, was born at Weimar, in 1712. His father, Johann Georg Dietrich, was court painter at Weimar, and sent him to Dresden to study under Alexander Thiele, a celebrated landscape painter. Dietrich rapidly distinguished himself, and in 1730 was appointed court painter to August II., king of Poland, which office was continued to him in 1741 by August III., who also sent him to Rome in 1743, where he remained only a year. He continued in court favour at Dresden till his death in 1774. Dietrich painted in various styles, and copied any master with surprising exactness. He was most able however as a landscape painter; but his views were generally arbitrary compositions, well coloured, transparent, and effectively lighted. He painted also many rustic pieces, and pieces in the style and manner of Watteau. Two collections of etchings by him have been published, which are very scarce.

There are twenty-seven of Dietrich's pictures in the Royal Gallery at Dresden, and there is a good collection of his drawings and sketches in the collection of prints there.

DIEULEFIT. [Drome.]

DIEUZE, or DUZE. [Meurthe.]

DIFFERENCE, the excess of one quantity over another. This fundamental meaning of the term is almost lost in the higher parts of mathematics, from the association of it with a methodised theory, derived from the consideration of the differences presented by successive quantities which follow a regular law. It is therefore a very wide branch of pure mathematics which must be considered under this term, namely, the method or calculus of differences.

DIFFERENTIAL CALCULUS, the name given by Leibnitz to the science which was digested nearly about the same time by himself and Newton, independently of each other, and which has of late years almost exclusively prevailed in this country, to the exclusion of the name, notation, and (so far as they differ) methods of Newton's fluxions.

It is impossible, in the smallest degree, to exhibit the present state and uses of a science into which all others merge as the student approaches the higher applications of mathematics.

The history of the differential calculus, at its first rise, is intimately connected with that of the Newtonian *Fluxions*, in consequence of the celebrated dispute as to the right of invention. [Newton.] On the history of the science since the time of Newton, there is no work from which we can trace out a connected account of the various steps by which the present system has been formed. In fact, most of the new investigations have been made with reference to some particular points of physical science. It would be very difficult to write the history of this calculus without entering at the same time into that of mechanics, optics, astronomy, &c., and of every subject to which it has ever been applied. An attempt at the former without the latter would be an account of the progress of language without mention of literature, oratory, or the drama.

The precursors of Newton and Leibnitz, namely, Archimedes, Cavalieri, Wallis, Barrow, Fermat, Roberval, and others touched so near upon the differential calculus, that it is obvious any of them might have taken the place of either of the first, if they had possessed more powerful means of algebraical development. After Vieta, Descartes, Wallis, and Newton (considered only as the discoverer of the binomial theorem), the step to a formal calculus was comparatively small. The essential part of the difficulty had been removed, and by much the greater part of the distance between Archimedes and Leibnitz had been gained. This point once attained, *methods* sprung up with rapidity, and in little more than a century we find the introduction of the various schemes which it will be necessary to mention, namely—Leibnitz's method of infinitesimals; Newton's method of prime and ultimate ratios; Newton's method of fluxions; Landen's method of vanishing fractions, or residual analysis; D'Alembert's method of limits; Lagrange's method of derivation.

Many other forms have been proposed, which either coincide in principle with one or other of the preceding, or are without any independent claim to notice. Several of the preceding, indeed, are more distinguished from each other by historical notoriety than by essential difference of character. If we distinguish carefully between the first principles of a method and the manner in which those principles are applied to algebra, it would not be any great stretch of assertion to contend that all the methods except the last are different ways of expressing the same fundamental ideas; and that the last (Lagrange's) is a proof that, so long as the preceding methods employed the usual amount of algebraical assumption in the establishment of the connection between themselves and algebra, that same quantity of assumption would have been sufficient for the basis of a purely algebraical science, equivalent to the differential calculus.

The method of Leibnitz assumes that quantities are made up of infinite numbers of infinitely small parts. It is a sort of atomic theory of pure magnitude, which is most obviously either false or obscure; for, so far as infinitely small quantities can be definitely explained, it is obvious that there are no such things, and any obscurity left in their definition extends itself throughout the whole science. But the falsehood of the supposition is not absolute; for, though magnitudes cannot be distinctly laid down to be composed of an *infinite* number of *infinitely small* parts, yet any magnitude can be divided into a number of parts *greater than any we may happen to name*, each of which parts shall be *less than any magnitude we may happen to name*. Thus it is perfectly obvious that a foot may be divided into parts more than a million in number, each of which shall be less than the hundred millionth part of an inch. If we may use such a phrase, the falsehood of the assertion may be made of as small an intensity as we please, and the consequence is, that its results turn out absolutely correct. All the difficulties of the science are concentrated into one single assertion; and when this assertion is once fairly understood, and received in a correct sense, all that follows is more easily understood and remembered, and far more easily applied than the results of any other method.

The system of Newton, known by the name of prime and ultimate ratios, was set forth in the first section of the 'Principia,' and is the method pursued throughout that work. It is in reality a method of limits, exhibited in a form which allows of a more ready application to geometry than to algebra, and accordingly it is abandoned by Newton himself in the method of fluxions. Instead of considering and comparing simultaneous increments of infinitely small magnitude, the ratios of small but finite increments are taken; and not these exactly, but the limits towards which they approach when the increments are diminished, which are called *ultimate* ratios, or *nascent* ratios, according as the increments are supposed to be *in the act* of growing from or diminishing towards nothing.

The method of fluxions was also given by Newton and with a peculiar notation, which maintained its ground in this country until about the year 1816. [FLUXIONS.] There are many fundamental ideas connected with sensible objects, which lead to a practical differential calculus, and might have happened to have been the means of suggesting a strict and mathematical theory. Newton adopted one of these, that of velocity, of which it may be said that its assumption as an answer to objections is a formal evasion of all the metaphysical difficulties of the subject. Since the proportions of all quantities may be represented by those of straight lines, the nature of the comparative changes which take place in continuously increasing or decreasing quantities may be referred to the velocities with which the terminal points of straight lines change their places. Velocity once clearly defined, in cases where it is variable there is no further difficulty. The method of limits of D'Alembert, which is now more frequently used than any other, was considered by the author himself as an explanation of Newton's prime and ultimate ratios.

The two remaining methods (those of Landen and Lagrange) are attempts to establish the science upon purely algebraical principles.

We shall now state two propositions, one geometrical, the other algebraical, in the words of the several systems.

Infinitesimals.—An infinitely small arc of a circle is equal to its chord.

Prime and ultimate Ratios.—If an arc of a circle diminish, the ultimate ratio which it bears to its chord is one of equality; or, if it begin to increase from nothing, the prime or nascent ratio of the arc and chord is that of equality. Or the arc is *ultimately* equal to its chord.

Fluxions.—If an arc increase from nothing with a uniform velocity, the velocity with which the chord increases is, at the first moment, equal to that of the arc.

Limits.—If the arc of a circle (and therefore its chord) diminish without limit, the limit of the ratio of the arc to the chord is one of equality.

Residual Analysis.—When the arc of a circle $= 0$ $\frac{\text{arc}}{\text{chord}} = \frac{0}{0} = 1$, which is ascertained by clearing the numerator and denominator of a factor which vanishes when arc $= 0$.

Theory of Functions.—When the arc is expanded in the following series,

$$\text{Arc} = A \times \text{chord} + B \times (\text{chord})^3 + \&c.$$

then $A = 1$.

Infinitesimals.—If an infinitely small increment dx be given to x, then x^3 receives the infinitely small increment $3x^2dx$.

Prime and Ultimate Ratios.—The ratio which any increment given to x bears to the consequent increment of x^3 is ultimately that of 1 to $3x^2$.

Fluxions.—If x be a line which increases with the velocity x, then x^3 increases with the velocity $3x^2 x$.

Limits.—The limit of the ratio obtained by dividing an increment of x^3 by the increment of x which produced it, on the supposition that the latter increment diminishes without limit, is $3x^2$.

Residual Analysis.—Since

$$\frac{y^3 - x^3}{y - x} = x^2 + xy + y^2$$

it follows that, when $y = x$, $\frac{x^3 - x^3}{x - x} = 3x^2$

Theory of Functions.—If $(x + h)^3$ be expanded in a series of powers of h, the coefficient of the first power of h is $3x^2$.

The term difference is continental; the older English term was *increment*.

DIFFRACTION OF LIGHT. The peculiar modifications which light undergoes when it passes by the edge of an opaque body are classed as phenomena of the *diffraction* or *inflexion* of light.

When a ray of solar light is transmitted through a very small hole in a card, or is collected in a point by means of a double convex lens, and then diverges from that point, if a small opaque plate of any outline be interposed in the course of the ray, the shadow of this object received on a parallel screen behind will be encompassed by a

series of coloured bands or fringes of a similar outline with the body, except at its angular points; the order of the colours in each fringe, reckoning from the outside towards the shadow, or inside, is, as in the prismatic spectrum, from red to blue; but the intermediate colours are less distinctly isolated, partaking of a mixture of the extreme tints. The actual shadow, or dark space within the innermost fringe, is also larger than the geometrical shadow which would have been cast if the rays had passed exactly by the edge of the body in straight lines and been received on the same screen.

When the interposed body is very narrow but of sensible width, streaks alternately brighter and darker will be found *within the shadow*, and a white line along the middle, when the body is of a long and slender rectangular form.

If the incident light were homogeneous, such as pure red, blue, &c., as found in the spectrum, the colour of the fringes, though differing in intensity from one another, would of course be the same as the incident light; but the sun's light, and most artificial light, being compounds of several simple coloured lights, the fringes in such case are of various tints which predominate on their external or internal limits, according as they are differently subject to the causes which produce diffraction.

The experiments of Sir Isaac Newton on the inflexion of light consisted chiefly in making a *pencil* pass between two straight knife-edges inclined to one another in a very acute angle; and, in his 'Queries,' he suggests that light may be subject to the action of forces, sensible only at very small distances from the surfaces of bodies, by which they describe sinuous paths with many contrary flexures, some being turned towards and others from the *shadow*, so as to form coloured bands or fringes. More complete explanations of the phenomena have since been given on the undulatory hypothesis, and M. Fresnel determined the positions and breadths of the fringes, on the supposition that they result from the propagation of the undulations in a whole wave of light, minus the portion of a wave surface subtending the same solid angle, at the origin of the wave, as an obstacle.

Dr. Young, by a very simple expedient, has converted Grimaldi's experiment [GRIMALDI], relative to the light streaks within the shadow of a long rectangular body, into the basis of his very beautiful theory of interferences. Let the light at one edge of the body be altogether stopped by an intercepting body placed before or behind the rectangular one, while the light is allowed free passage as before at the other side; the streaks will notwithstanding be instantly obliterated, showing that those streaks are produced by the interference of waves passing on either side of the body, and having their length either equal or differing by a small multiple of the length of an undulation.

Many beautiful optical phenomena arising from diffraction have been produced by transmitting light through one or several small holes, or the interstices of fine wire work, and even by reflection between plane mirrors inclined at a very small angle. Persons desirous to be further acquainted with these phenomena may consult the memoirs of Young, Fresnel, and Fraunhofer. Some interesting facts on the same subject have also been supplied by Sir J. Herschel in his treatise on Light, in the *Encyclopædia Metropolitana*. (See also Airy's *Tracts*, p. 318, &c., 2nd ed.)

DIGAMMA, or VAU, is the name given by grammarians to a letter which once belonged to the Greek alphabet. It appears to have occupied the sixth place in that alphabet, for while *epsilon* is employed as the numerical symbol for *five*, the next letter, as that alphabet is now arranged, is the representative of *seven*. Moreover, this position of the digamma corresponds with that of *vau* or *waf* of the Hebrew, and of *f* in the Latin alphabet, two letters of kindred power and form. The letter is still seen in many inscriptions. With regard to the power of the letter, it is now the general and well-established opinion that it is equivalent to our own *w*.

The use of the digamma prevailed more particularly in the Æolic dialect of the Greek tongue. In the other dialects it was commonly dropped, particularly the Attic; and, as this became the favourite dialect of Grecian literature, the digamma at last escaped from the alphabet, and even the Homeric poems, which had been written in a dialect still possessing the digamma, were presented to the Athenians without that letter, to the serious injury of the metre. But, though the form of the digamma was not admitted into the Attic alphabet, the vowel *o* was occasionally used, so as virtually to represent it, as in οἶδα, οἶκος, οἶνος, equivalent to FΙΔΑ, FΙΚΟΣ, FΙΝΟΣ (comp. the Latin *video*, *vicus*, *vinum*); and it was superfluous to prefix the digamma, ΓΟΙΚΟΣ, as was sometimes done.

The Latin language, being more closely connected with the Æolic dialect of the Greek, is abundant in the use of this letter; for the true pronunciation of the *v* or *u consonans* must have been the same as our *w*, or it could not have so readily interchanged with the vowel *u*. The Greek words ὠν, ἑαρ, ἑσπερος, ἑστια, ἰον, appear in Latin as *ovum*, *vĕr*, *vesperus*, *vesta*, *viola*. Sometimes a *b* appears in the Latin word, where the Æolic Greek must have had the digamma, as *probus* compared with πρᾶϝυς.

The disappearance of the digamma in one dialect and its retention in another is in perfect accordance with what is seen in modern languages. In our own we have ceased to pronounce the *w* in *who*, *whose*, *two*, *sword*, *answer*, *whole*; while in *one* and *once* we have the sound without the character, and yet drop it again in *only*. The Danish dialect of the Teutonic language throws off the *w*: thus *word* in the mouth of a Dane is *ord*.

For the assertions of the grammarians, and the opinions of the learned with regard to the digamma, see Kidd's edition of Dawes's *Miscellanea Critica*, pp. 175-335.

DIGBY, SIR EVERARD, was born in 1581, of an ancient, honourable, and wealthy family, but is chiefly known from his connection with the Gunpowder Plot. At his trial for this conspiracy he pleaded guilty, and was executed Jan. 30, 1605-6. [FAWKES, GUIDO GARNETT.]

DIGBY, KENELME, the son of Sir Everard

Digby, was born in 1603. He was sent to Oxford University at the age of fifteen. His ability was early apparent. He left the university in 1621. Under Charles I. he became a gentleman of the bedchamber, a commissioner of the navy, and a governor of the Trinity House. In 1628 he equipped at his own expense a squadron with which he sailed first against the Algerines, and afterwards against the Venetians, who had some dispute with the English. In 1636 he went to France, and became a convert to the Roman Catholic religion. He returned to England in 1638, and was imprisoned as a royalist on the breaking out of the civil wars, but was at length suffered to retire to France. Sir Kenelme travelled about France and Italy during this time, but in 1655 he was allowed by the Protector to return to England, where after another visit to France, whence he returned in 1661, he passed the remainder of his life, and died in 1666.

Sir Kenelme Digby married Venetia Anastasia Stanley, daughter of Sir Edward Stanley of Tonge Castle in Shropshire, a lady celebrated for her beauty, which Sir Kenelme showed great anxiety to preserve: he invented cosmetics for that purpose, and made her the subject of several strange experiments. There are pictures of her by Vandyk, one of which is now in Windsor Castle.

Sir Kenelme Digby, though he fell into the errors of philosophy and many of the wild dreams which were common in his day, was certainly possessed of no ordinary talents. For his character we must refer our readers to Lord Clarendon (*Life*, vol. i. p. 34), who has ably described it. The following is a list of his writings:—'A Conference with a Lady about the choice of a Religion,' Paris, 1638; 'Letters between Lord George Digby and Sir Kenelme Digby concerning Religion,' Lond. 1651; 'Observations on Religio Medici,' Lond. 1643; 'Observations on part of Spenser's Fairy Queen,' Lond. 1644; 'Treatise on the Nature of Bodies,' Paris, 1644; 'A Treatise on the Soul, proving its Immortality,' Paris, 1644; 'Five Books of Peripatetick Institutions,' Paris, 1651; 'A Treatise of adhering to God,' Lond. 1654; 'Of the Cure of Wounds by the Powder of Sympathy,' Lond. 1658; 'Discourse on Vegetation,' Lond. 1661.

DIGBY, GEORGE, EARL OF BRISTOL, was born in 1612, and died in 1667. He occupied a rather prominent figure in the political history of his country during the reigns of Charles I. and Charles II. He was unquestionably an able man, but his ability was not exercised in a manner most creditable for himself, or the most advantageous to his country. His literary character is not more than respectable. His principal works are several speeches, a good many letters, a translation of the first three books of the French romance of 'Cassandra,' and a lively play called 'Elvira, or the Worst not always True, a Comedy, written by a Person of Quality,' which was licensed and printed in 1667, and is reprinted in Dodsley's 'Old Plays.'

DIGEST. [CORPUS JURIS; JUSTINIAN'S LEGISLATION.]

DIGESTION, the process by which the food is converted into nutriment. Taken in its whole extent, the process of digestion comprehends the entire series of changes by which the crude aliment is assimilated into arterial blood. These changes are effected by organs which, viewed collectively, comprise a most extensive apparatus commencing at the mouth and ending at the lungs.

The first changes upon the food are effected in the mouth where it is mixed with saliva. This fluid seems to be of great importance in preparing the food for the further changes it has to undergo in digestion. The saliva varies considerably in specific gravity, being always denser after a meal than during fasting. Healthy saliva has mostly the specific gravity of 1007.9. Healthy saliva is either alkaline or neutral, generally the former, and contains a principle termed *ptyalin*. Sulphocyanogen is a constant ingredient of the saliva. The occurrence of this substance in the saliva is equally interesting in a physiological and in a medico-legal point of view. The circumstance that it forms with the persalts of iron a beautiful cherry-red, of the same colour as the meconate of iron, must not be overlooked in examining the stomach in a case of suspected poisoning by opium.

Mialhe has discovered in the saliva an active principle analogous in its physical and chemical characters to diastase. It is solid, white or grayish white, amorphous, insoluble in alcohol, but soluble in water and in weak spirit.

By the œsophagus the food is conveyed into the stomach, where it is converted into a fluid termed chyme. The chyme when duly prepared in the stomach is transmitted to the small intestines, in the first portion of which it is converted into a new substance called chyle. The small intestines are clothed with small organs called villi, which are covered with cells in which most important changes take place. According to Mr. Goodsir there is a continual development of cells at the extremity of each villus, and these cells are the agents by which the *secretion* of the nutritious fluid is accomplished, and by which it undergoes its first preparation for the purposes which it has to fulfil. As the chyme passes along the small intestine, an increased quantity of blood circulates in the capillaries of the gut. In consequence of this increased flow of blood, the internal surface of the gut throws off its epithelium, which is intermixed with the chyme in the cavity of the gut. The villi become turgid with blood, erected, and naked, and are covered or coated by a whitish gray matter, which consists of chyme, of cast-off epithelia of the villi, and of the secreting epithelia of the follicles. The function of the villi now commences. The minute vesicles which are interspersed among the terminal loops of the lacteals of the villus increase in size by drawing materials from the blood through the coats of the capillary vessels, which ramify at this spot in great abundance. While this increase in their capacity is in progress, the growing vesicles are continually exerting their absorbing function, and draw into their cavities that portion of the chyme in the gut necessary to supply materials for the chyle. When the vesicles respectively attain in succession their specific size, they burst or dis-

solve, their contents being cast into the texture of the villus, as in the case of any other species of interstitial cell. The débris, and the contents of the dissolved chyle cells, as well as the other matters which have already subserved the nutrition of the villus, pass into the looped net-work of lacteals, which, like other lymphatics, are continually employed in this peculiar function.

The solution of the food by the gastric juice is a chemical operation, and the gastric juice is a chemical agent, the exact nature of which is now clearly ascertained. Spallanzani discovered that the gastric juice is of an acid nature. Some years ago Dr. Prout ascertained that this acid is the muriatic. Dr. Prout's experiments were repeated by some distinguished chemists in France with different results; but the accuracy of Dr. Prout's conclusions was afterwards confirmed by the experiments of Tiedemann and Gmelin, and they have received a fresh confirmation by the more recent experiments of Bracconnot, of Blondelot, and others, so that it may be now considered as established that the agent by which the solution of the food in the stomach is effected is muriatic acid or chlorine. If meat and gastric juice be inclosed in a glass tube, and kept at the temperature of the human body, a product is obtained closely resembling the fluid formed by the solution of the food in the stomach. If meat be inclosed in a glass tube with dilute muriatic acid, and kept at the temperature of the blood, a perfectly similar product is obtained.

The muriatic acid constituting the essential ingredient of the gastric juice is conceived to be derived by an act of secretion from common salt, muriate of soda, contained in the blood. The alkali, the base of the salt, is retained in the blood to maintain the alkaline condition essential to its healthy constitution, while the acid is liberated, and poured, in the form of gastric juice, into the stomach to accomplish the solution of the food.

After the food has undergone the action of the gastric juice, it loses its sensible properties, and is converted into the homogeneous semi-fluid mass which has received the name of chyme.

Gradually as it is formed, the chyme accumulates in the pyloric extremity of the stomach. When the accumulation amounts to a certain quantity, the pylorus relaxes, and allows the chyme to flow from the stomach into the first portion of the small intestines, the duodenum. Here it is mixed with the mucus of the intestines, with the pancreatic juice, and with the bile. The bile slowly and at intervals, a drop about twice in a minute, flows into the duodenum, and diffuses itself over the neighbouring surface. On coming in contact with the chyme, the bile imparts to it its sensible qualities, its colour, and bitterness. At this stage of the process the changes take place which we have described above, and which result in the formation and absorption of the chyle. The lacteals convey the chyle thus formed into the thoracic duct, and from thence it is conveyed into the circulation.

The result of the successive changes wrought upon the food during the digestive process is to approximate the crude aliment more and more nearly to the chemical condition of the blood. This is accomplished partly by the gastric and intestinal juices, and partly by matters combined with the food, highly animalised in their own nature, and endowed with assimilative properties—as the salivary secretion mixed with the food during mastication; the pancreatic and biliary secretions mixed with the food during the conversion of chyme into chyle; the mesenteric secretions mixed with the elaborated chyle of the mesenteric glands; and, lastly, organised particles, which have already formed a part of the living structures of the body, mixed with the chyle under the form of lymph in the thoracic duct.

It is the office of the large intestines, into which only a very small portion of chyle enters, to prepare the excrementary part of the aliment for its expulsion, and to generate the force by which, when duly prepared, it is conveyed from the body. These organs possess a modification of structure adapting them in the most admirable manner for the performance of this twofold office.

DIGESTION, in Chemistry, is the exposure of any substance to partial or total solution in a fluid, either at common temperatures or with a gentle heat, as in the preparation of tinctures. It is commonly performed in a glass matrass, which is half filled with the fluid, and covered with a piece of wet bladder at the mouth.

DIGGES, LEONARD, a distinguished mathematician of the 16th century, was descended from an ancient family in the county of Kent. He was born at Diggescourt, in the parish of Barham, in the same county. He was educated at Oxford; but, having an ample property, he retired to his own seat, devoting his life to the study of geometry and its practical applications, which he cultivated with great success. He died in 1574.

DIGGES, THOMAS, the only son of Leonard Digges. He was educated by his father with great care, and afterwards at Oxford, where he much distinguished himself; and ultimately he became one of the first mathematicians of his age.

He chose the military profession, and was appointed muster-master-general to the forces sent out by Queen Elizabeth to succour the oppressed inhabitants of the Netherlands. Of his military career, however, no other evidence is known to exist except his writings on the subject.

Digges wrote many works which he left in MS., and which have never been published, on account, it is stated, of the perplexity created by lawsuits in which he was engaged. He died in 1595; but, except the accomplished politician and elegant writer, Sir Dudley Digges, none of his children claim a niche in the history of their times, though two others were authors of printed works. Sir Dudley Digges was born in 1583, and died in 1676.

DIGIT, 'a finger,' a term employed to signify any symbol of number from 0 to 9. According to the original application of the term, the ten first numbers should be called digits, but universal practice employs the word to signify the ten symbols used in reckoning numbers. Thus ten (10) is a number of two digits.

DIGITA'LIA, a vegetable alkali procured from the *Digitalis purpurea*, or foxglove, and similar to other vegetable alkalies in its general properties.

DIGITA'RIA, a genus of grasses belonging to the tribe *Paniceæ*. This genus has obtained its name from the singular form of its heads of flowers, which look like fingers (*digitus*, a 'finger'). *D. sanguinalis* is a common plant in Germany, and has obtained its specific name from an idle trick which the boys in some parts of Germany have of pricking one another's noses with its spikelets till they bleed. It abounds by the roadsides in Poland and Lithuania, in which countries its seeds are collected, and boiled whole like rice with milk, and it is esteemed a pleasant article of diet. *D. humifusa* is a rare plant. It is a native in many parts of England, and grows in sandy fields.

DIGITA'LIS, a genus of scrophulariaceous plants. Several species are known. *D. lutea* is a common plant in the woods of France and Germany. *D. ochroleuca* and *D. grandiflora* are met with rather more to the eastward; while *D. ferruginea* and its allies, with short roundish rust-coloured flowers, occur not unfrequently in the south-eastern parts of Europe and in Asia.

Over all the west of Europe, but not in Asia, is found abundantly, especially in England and France, the *D. purpurea*, a very handsome species, with large purple or white flowers, to which the name of Foxglove is popularly applied. It is extensively employed in medicine. The leaves are sometimes accidentally confounded with those of different species of *verbascum*, and of the *Conyza squarrosa*. The most powerful leaves are those procured from plants growing on the sunny sides of hills. They must be carefully dried, and protected from damp. The active principle appears to reside in an extractive substance, which by careful evaporation may be crystallised, and to which the name of Digitaline has been given. This principle is soluble in water, in alcohol, and possibly in æther. It is very poisonous. One grain dissolved in a little water killed a rabbit in a very short time. Digitalis is given in powder, in pills, or in an alcoholic tincture. Writers on this substance differ as to the primary action on the system, but it is undoubtedly determined by the frequency and power of the dose given. When but a small quantity at rapid intervals is given, the effect is at first stimulant; but, when a large dose is administered, the sedative action commences immediately.

Digitalis is the most perfect example known of a cumulative poison, as it may be used for some time, if the doses be small, without producing any manifest effect for several days, when sudden faintness, intermittent pulse, giddiness, and other alarming symptoms appear. These are best combated by vital stimulants, such as warm brandy and water.

Digitalis has the power of reducing in a remarkable degree the heart's action, bringing down the pulse from 120 or more to 50 or 40 beats in a minute, and causing it to become at the same time intermittent. On this power depends its medical value in some diseases.

As a diuretic, it is, like most medicines of that class, uncertain in its effects: it seldom answers if much inflammatory action exist when it is exhibited. To render it more certain it is generally given along with calomel, and squills, or some other diuretic.

DIGNE. [ALPES, BASSES.]

DIGNITIES. [TITLES OF HONOUR.]

DIGOIN. [SAONE-ET-LOIRE.]

DIGY'NIA, a systematic name given by Linnæus, in his artificial system, to such plants as have two styles, or a single style deeply cleft into two parts.

DIJON, the capital formerly of the duchy of Burgundy, and now of the department of Côte-d'Or, in France, stands on the left bank of the Ouche, a tributary of the Saône, at a distance of 162 miles S.E. from Paris, in 47° 19′ N. lat., 5° 2′ E. long., and has 29,044 inhabitants. It existed, during the Roman dominion, under the name of Dibio. From the Romans it passed, in the 5th century, to the Burgundians, and subsequently to the Franks. Under the Carlovingian princes, Dijon was a lordship of the bishops of Langres, who often resided there. In the 9th century it was under counts of its own, who held it of the bishops as suzerains. In the 11th century the lordship of Dijon was united to the duchy of Bourgogne. The dukes of Bourgogne usually resided here; and when Louis XI. of France took possession of Bourgogne, and established the provincial parliament, he fixed its sittings in this town.

Dijon is situated in a plain on the eastern side of the Côte-d'Or hills. It is surrounded by walls and by ramparts which are planted with fine trees. The town is entered by five gates; it is traversed from north to south by the Suzon, which flows in a channel formed under the streets, and joins the Ouche close to the ramparts. The streets are well built, clean, and cheerful. The houses, which are of freestone, are only of one or two stories. Of the public buildings the most important are—the cathedral dedicated to St. Benigne, which dates from 1291, and is surmounted by a spire 330 feet high; the churches of Notre-Dame and St.-Michel; the palace of the states of Bourgogne, which is surmounted by a lofty tower, now used as an observatory, and contains museums of painting, sculpture, antiquities, and natural history, and also a library of 40,000 volumes; the court-house; the theatre, which is built after the model of that of Bordeaux; the residence of the prefect of the department; the town-house; the general hospital; and the orphan asylum of Sainte-Anne.

The manufactures of Dijon are woollen cloth, hosiery, blankets, woollen and cotton yarn, leather, vinegar, mustard, and starch; there are also brandy distilleries, salt refineries, and breweries. A large trade is carried on in corn, flour, the excellent wine of the Côte d'Or, wool, hemp, and wax candles. Dijon is well situated for trade at the junction of several roads; the Canal de Bourgogne passes along the valley of the Ouche, close to the town. [CÔTE-D'OR.]

Dijon is the seat of a bishop, whose see is co-

extensive with the department of Côte-d'Or. It is also the seat of a university academy and of a cour royale, which have jurisdiction over the departments of Côte-d'Or, Haute-Marne, and Saône-et-Loire. In connection with the university there are in Dijon three faculties of law, science, and letters, a secondary school of medicine, and a royal college; and in the three departments 20 communal colleges, 36 boarding schools, 2 normal schools, and 1855 day schools. The town also possesses an ecclesiastical college, a botanic garden, and an excellent school of design, in which lectures are delivered gratuitously. The 18th Military Division, which includes the three departments before named, together with those of Aube and Yonne, has its head-quarters at Dijon.

Few cities in France can vie with Dijon in beauty of site, or in the number and variety of its promenades, which form a belt of foliage about the town. Among the latter are the ramparts, which afford a fine view of the town and the surrounding country; the Chemins-Couverts; the Allées-de-la-Retraite on the east side of the town formed by four rows of noble lime trees; the Creux d'Enfer and the Fontaine Suisse, two beautiful fountains surrounded by fine plantations; the promenade de l'Arquebuse; and above all the Cours du Parc, which is nearly a mile in length, divided midway by a spacious circle, and leads to the great park laid out by Le Nôtre on the banks of the Ouche.

(*Dictionnaire de la France;* Murray's *Handbook of France.*)

DILAPIDATIONS. [Benefice.]

DILIGENCE. [Coach.]

DILIGENCE, in the law of Scotland, is an expression nearly equivalent to *execution* in the law of England. It includes the various means by which the person may be seized and imprisoned, or the property attached and disposed of, to the end of enforcing payment of a debt or performance of any civil obligation. There are certain pecuniary obligations, of which it is the characteristic that summary or the more rapid kind of diligence can proceed on them if they are not in any way vitiated or imperfect. These are bills of exchange and promissory notes, and the facility of recovering such debts by a rapid execution is a marked feature in the mercantile code of Scotland. Before diligence can issue, these documents must be protested and registered in the books of some competent court, and thence the diligence issues, as if it were founded on the decision of the court.

Diligence is either against the person, by imprisonment, or against the estate, by attachment and sale. Formerly diligence, in the greater number of cases, proceeded on the fiction that the debtor, being charged to pay in the king's name, and refusing, was to be denounced a rebel by a messenger at arms, who certified that he performed the denunciation by three blasts of a trumpet, and it was nominally as a rebel that his person and estate were seized. A more simple and economical procedure has been substituted for this by 1 & 2 Vict. c. 114.

DILL, an aromatic umbelliferous plant, whose fruit is employed medicinally as a useful carminative. It is a Spanish biennial, and is called *Anethum graveolens* by botanists. [Carminatives.]

DILLENIA'CEÆ, a natural order of plants belonging to polypetalous albuminous exogens.

The plants of this order are chiefly Asiatic trees or shrubs, and usually yellow-flowered. A few occur in America. The trees are found in the woods of tropical India; the bushes inhabit New Holland, especially in the more temperate parts, and in China; the woods of Brazil contain several kinds, usually climbers or having a trailing habit. They appear to possess astringent properties, but nothing further of importance.

The species in cultivation in this country are almost all Australasian, and have something the appearance of yellow-flowered Cistuses. Among these occur species of the curious genus *Pleurandra*, in which the stamens are developed on one side only of the flower, all those on the opposite side being abortive. There are few analogies to this in the vegetable kingdom. *Hibbertia volubilis* is a showy twiner, but its flowers are intolerably offensive in their smell.

DILLENIUS. [Sherard.]

DILUENTS comprise those liquids which are used to dilute the fluids of the human body, and thereby modify their nature. They are employed when the secretions are too viscid, or the contents of the stomach, of the intestines, or any of the glands are too acrid, and also when the heat of the body, as indicated by thirst, &c., is too great, and causes a feeling of uneasiness.

Water is the simplest and often the best diluent, but it may be rendered more agreeable in some cases by being made into toast-water, or by having acids or other substances added to it.

DILUVIAL FORMATION. The superficial deposits of gravel, clay, and sand (sometimes containing shells and bones of land mammalia), which lie far from their original sites on hills, and in other situations to which no forces of water now in action could transport them, are thus termed. The explanations proposed by geologists are various, and as yet unsatisfactorily demonstrated. Violent floods passing over the land, streams flowing formerly at levels and in lines now impossible, the littoral action of the sea during the time of the uplifting of the land, glacier movements, and the floatation of the icebergs over the surface while yet it was covered by the ocean, have all been strongly proposed for adoption: but the phenomena are very complicated, and seem to require many partial solutions, involving change of level of sea and land as the fundamental condition. For a statement of the many interesting facts on this subject, see Buckland, *Reliquiæ Diluvianæ;* Agassiz, *Etudes sur les Glaciers;* Murchison, *Silurian System;* Hopkins, in *Cambridge Phil. Trans.*

DIMENSION (Algebra), a term which is used in the same sense as *Degree.* Thus x^2y is of three dimensions, or of the third degree. In geometry, length is of one dimension, surface of two, and solidity of three. Thus geometry of three dimensions means solid geometry.

DIMEROCRINITES, a genus of *Crinoidea,*

proposed by Phillips ('Sil. System,' t. 17) to include species of *Crinoidea inarticulata* of Miller, with the finger-joints in double rows. From the Wenlock limestone.

DINAN. [CÔTES-DU-NORD.]

DINANT. [NAMUR.]

DINARCHUS, one of the ten Greek orators, for the explanation of whose orations Harpocration compiled his Lexicon. Dinarchus was a Corinthian by birth, who settled in Athens and became intimate with Theophrastus and Demetrius the Phalerian. Dionysius of Halicarnassus fixes his birth about the archonship of Nicophémus, B.C. 361. The time of his highest reputation was after the death of Alexander, when Demosthenes and other great orators were dead or banished. After the garrison which Cassander had placed in Munychia had been driven out by Demetrius, B.C. 307, Dinarchus, being involved in a charge of conspiring against the democracy, and having been attached to the aristocratical party, withdrew to Chalcis in Eubœa. Demetrius afterwards allowed him to return to Athens with other exiles, in the archonship of Philippus, B.C. 292. Of the numerous orations of Dinarchus only three remain. One of them is against Demosthenes touching the affair of Harpalus. The three extant orations of Dinarchus are printed in the usual collections of the Attic orators.

DINDIGUL, a town in Hindustan, capital of the district of Dindigul, is situated in 10° 20′ N. lat., 78° 2′ E. long. The town is clean and neat, and contains about 7000 inhabitants.

DINGLE. [KERRY.]

DINGWALL. [ROSS-SHIRE.]

DINORNIS, a genus of extinct wingless birds the relics of which are found in New Zealand in superficial deposits. Professor Owen, who established this genus, describes the following species:—*Dinornis giganteus*, which must have stood about ten feet in height; *D. struthoides*, seven feet high; *D. didiformis*, four feet high; *D. otidiformis*, size of the Great Bustard (*Otis tarda*). ('Proceeds. Zool. Soc.' 1843.)

The causes which have led to the extinction of these gigantic birds are not very clear. Most probably they became extirpated by the natives, to whom they must have been valuable as food, seeing that New Zealand possesses no indigenous mammalia. That they were once very abundant is proved by the great numbers of bones which have been collected since attention has been directed to the subject. It would seem as if New Zealand at no distant date was a nursery of wingless birds, all of which have perished, with the exception of two species of *Apteryx*, which being of comparatively small size, and endowed with habits of concealment, have escaped the general destruction. These two birds may be regarded as the relics of a once extensive group of large wingless species peculiar to New Zealand.

DINOTHE'RIUM, a genus of gigantic extinct herbivorous mammifers, established by Professor Kaup. The remains (of two or more species) have been found most abundantly at Epplesheim in Hesse Darmstadt, in a stratum of sand referable to the second period of the tertiary formations (Miocene of Lyell). Fragments are noticed as occurring also in several parts of France, Bavaria, and Austria, by Cuvier, who, from the resemblance of the molar teeth to those of the tapirs, at first considered the animals to have been an enormous species of the last-named genus. The length of the *Dinotherium giganteum* has been estimated at eighteen feet. The skull of this extraordinary animal is of vast size, and from the situation and characters of the nasal orifice, with the salient bearing of the nasal bones, there is reason to suppose that the animal was furnished with a proboscis. The orbits are small, but the temporal fossæ are very deep and extensive, indicating the great mass of temporal muscle. The lower jaw is most remarkable; its symphysis or anterior portion is greatly produced and reflected downwards, forming the sockets of two enormous tusks, which curve slightly backwards, reminding us of those of the upper jaw in the walrus. The molars are five on each side above and below: the third has three transverse ridges across its surface; the first molar has only one, the others two. The lower jaw, exclusive of the tusks, measures nearly four feet in length. The occipital condyles are terminal, or in the direction of the longitudinal axis of the head, and the occipital surface is large and subvertical.

The situation and affinities of the *Dinotherium* have been the subject of much speculation, and very opposite opinions have been entertained by different naturalists. M. Kaup, influenced by the discovery of huge claws and a scapula resembling in character those of the Pangolins, assigns the animal to the *Edentata*, but differing from all extant species, not only in exceeding the elephant in size, but in having, like the elephant, a proboscis. Dr. Buckland regards the *Dinotherium* as approximating to the tapir, to have been of aquatic habits, and furnished with a proboscis, by means of which it conveyed to the mouth the vegetables raked from the bottom of lakes and rivers by its tusks and claws, and that it probably used the tusks as anchors to which to moor itself to the bank, or as climbing instruments, assisting the animal in its efforts to ascend any steep place bordering the water's edge. MM. Blainville and Dumeril consider the Dinotherium to have been allied to the Lamantins or 'aquatic gravigrades,' to have been in fact a Dugong or Duigong, with tusk-incisors in the lower jaw, and therefore one of the concluding forms of the Pachydermata. They consider that it had no proboscis, but a huge inflated muzzle and upper lip. Gæger places the Dinotherium with the Seals.

Now, as it regards M. Kaup's theory, we may at once state that the claws and scapula, on which he founds it, are not proved to belong to the *Dinotherium*; and M. Kaup himself admits, that should the discovery take place of other fossil relics, whence the certain existence of a *manis gigantea* might be presumed, his theory would be overthrown.

There can be little doubt, we think, that the *Dinotherium* was aquatic in its habits. The weight and form of the lower jaw and tusks, the position of the occipital condyles, the characters of the occiput, indicating voluminous muscles and

an enormous cervical ligament, are such as might be expected in an animal destined to inhabit the water, in which the weight of the ponderous lower jaw would be relieved.

Dr. Buckland informs us that the bones of the *Dinotherium* have been lately found in tertiary fresh water limestone near Orthes, at the foot of the Pyrenees, and with them the remains of a new genus allied to the Rhinoceros, of several unknown species of deer, and of a dog or wölf equalling a lion in size.

(Buckland's *Bridgewater Treatise; Journal des Débats*, March 1837; Kaup's work on the *Dinotherium*, 4to., Darmstadt, 1836.)

DIOCESE. [BISHOPRIC.]

DIOCLETIANUS, CAIUS VALERIUS, was born at Dioclea, in Dalmatia, some say at Salona, about 245 A.D., but others make him ten years older. His original name was Diocles, which he changed into Diocletianus. He entered the army at an early age, and rose gradually to rank; he served in Gaul, in Mœsia under Probus, and was present at the campaign against the Persians, in which Carus perished. Diocletian commanded the household or imperial bodyguards when young Numerianus, the son of Carus, was secretly put to death by Aper his father-in-law, on the return of the army from Persia. The death of Numerianus being discovered after several days by the soldiers near Calchedon, they arrested Aper and proclaimed Diocletian emperor, who protested his innocence of the death of Numerianus, and, upbraiding Aper for the crime, plunged his sword into his body. Diocletian entered Nicomedia in September 284, which town he afterwards chose for his favourite residence. Carinus, the other son of Carus, who had remained in Italy, having collected a force to attack Diocletian, the two armies met at Margum in Mœsia, where the soldiers of Carinus had the advantage at first, but Carinus being killed during the battle by his own officers, both armies joined in acknowledging Diocletian emperor, A.D. 285. Diocletian used his victory with generosity.

The empire was at this time assailed in various quarters: on the Persian frontier, on the side of Germany and of Illyricum, and in Britain; a serious revolt had broken out in Gaul. To quell the disturbance in Gaul, Diocletian sent his old friend Maximianus, a brave but rude soldier, who defeated the insurgents. In the year 286, Diocletian chose Maximianus as his colleague in the empire, under the name of Marcus Valerius Maximianus Augustus. Maximianus was stationed in Gaul and on the German frontier; Diocletian resided chiefly in the East to watch the Persians. About A.D. 288 Maximianus defeated the Germans near Treves, and Diocletian marched against other tribes on the Rhætian frontier. In 289 peace was made between Carausius, who had revolted in Britain, and the two emperors, Carausius being allowed to retain Britain. In 290 Maximianus and Diocletian met at Milan to confer on the state of the empire, after which Diocletian returned to Nicomedia. The Persians soon after again invaded Mesopotamia and threatened Syria, and, the empire being attacked on other sides also, Diocletian increased the number of his colleagues. On the 1st March, 292, or 291 according to some chronologists, he appointed Galerius as Cæsar, and presented him to the troops at Nicomedia. At the same time Maximianus adopted Constantius called Chlorus. The two Cæsars repudiated their respective wives; Galerius married Valeria, Diocletian's daughter, adding to his name that of Valerianus; and Constantius married Theodora, daughter of Maximianus. Galerius was a native of Dacia, and a good soldier, but violent and cruel. Diocletian kept Asia and Egypt; Maximianus had Italy and Africa; Galerius, Thrace and Illyricum; and Constantius had Gaul and Spain. But it was rather an administrative than a political division. Writers have been very free of their censure upon this emperor for parcelling the empire; but this was the only chance of preventing its crumbling to pieces. The empire was much too large for one single man or a single central administration. Constantius defeated the Franks and the Alemanni, and soon after reconquered Britain. Galerius subjugated the Carpi, and transported the whole tribe into Pannonia. In the year 296, the Persians, under their king Narses, again invaded Mesopotamia and part of Syria. Galerius marched against them, and at first was unsuccessful; but in the following year he defeated the Persians. Narses sued for peace, which was granted, A.D. 297, by Diocletian, on condition of the Persians giving up all the territory on the west bank of the Tigris. About this time Diocletian put down an insurrection which had been raised in Egypt under Achillæus, and he treated the country with great severity. He fixed the limits of the empire on that side at the island of Elephantina. Maximianus in the meantime was engaged in putting down a revolt in Mauritania. For several years after this the empire enjoyed peace. Diocletian kept a splendid court at Nicomedia, which town he greatly embellished. Maximianus, by his order, caused the magnificent Thermæ at Rome to be built, the remains of which still bear Diocletian's name, and which contained, besides the baths, a library, a museum, and public walks.

In February 303, Diocletian issued an edict against the Christians, ordering their churches to be pulled down, their sacred books to be burnt, and all Christians to be dismissed from offices civil or military, with other penalties, exclusive, however, of death. Various causes have been assigned for this measure. Galerius had always been hostile to the Christians, while Diocletian had openly favoured them. But the Christians were charged with conspiracies, and Diocletian was also superstitious: fear and superstition probably both combined to urge him to persecution. The church of Nicomedia was the first pulled down by order of the emperor. The rashness of a Christian, who publicly tore down the imperial edict, exasperated Diocletian still more: the culprit was put to a cruel death. A second edict ordered all magistrates to arrest the Christian bishops and presbyters, and compel them to sacrifice to the gods. This was the beginning of a cruel persecution, the last persecution under the

Roman empire, and it has been called by the name of Diocletian. But he had little share in it, beyond issuing the two edicts, which he did reluctantly and after long hesitation, according to the admission of Lactantius. He fell ill a few months after, and on recovering from his illness he abdicated. Galerius, who had instigated the persecution, was the most zealous minister of it; and he continued it for several years after Diocletian's abdication. The countries under the government of Constantius suffered the least from it.

In November of the year 303 Diocletian repaired to Rome, where he and Maximianus enjoyed a triumph, the last that Rome saw. On the 1st of May, 305, Diocletian, who had returned to Asia, repaired with his guards to a spot, three miles out of Nicomedia, where, addressing his officers and court, he said that the infirmities of age warned him to retire from power, and he proclaimed Galerius as Augustus, and Maximinus Daza as the new Cæsar. Diocletian clothed Maximinus with the purple vest, after which he set off for Salona in Dalmatia, near which he built himself an extensive palace by the sea-shore, where he lived for the rest of his life. Part of the external walls which inclosed the area belonging to his palace and other buildings still remain, with three of the gates, as well as a temple, which is now a church at Spalatro, or Spalato, in Dalmatia, a comparatively modern town, grown out of the decay of the ancient Salona, and built in great part within the walls of Diocletian's residence, from the name of which 'Palatium' it is supposed that 'Spalato' is derived. At the same time that Diocletian abdicated at Nicomedia, Maximianus, according to an agreement between them, performed a similar ceremony at Milan, proclaiming Constantius as Augustus, and Severus as Cæsar. In his retirement, Diocletian cultivated his garden, and enjoyed the repose which power does not give. Once only he left his retirement to meet Galerius in Pannonia for the purpose of appointing a new Cæsar, Licinius, in the room of Severus, who had died. Licinius was not grateful, for after the death of Galerius, A.D. 311, he ill-treated his widow, Valeria, Diocletian's daughter, who with her mother, Prisca, took refuge in the territories of Maximinus Daza. Daza offered to marry Valeria, but on her refusal exiled both her and her mother to the deserts of Syria. Diocletian remonstrated in favour of his wife and daughter, but to no purpose, and his grief on this occasion probably hastened his death, which took place at Salona, in July 313. In the following year his wife and daughter were put to death by order of Licinius.

Diocletian was among the most distinguished emperors of Rome; his reign of twenty-one years was upon the whole prosperous for the empire. He was severe, but not wantonly cruel. His conduct after his abdication shows that his was no common mind. The Christian writers, and especially Lactantius, have spoken unfavourably of him. His laws or edicts are in the Codes of Theodosius and Justinian.

DIODA'TI, JEAN, was born at Geneva in 1576. His progress in learning was so rapid, that he became professor of Hebrew in the University of Geneva when he was only 21 years of age. He was afterwards a parish priest, and in 1609 professor of theology. He was sent by the clergy of Geneva on several missions, first to the reformed churches in France, and afterwards to those of Holland, where he attended the Synod of Dort, 1618-19, and was one of the divines appointed to draw up the acts of that assembly. Diodati was distinguished as a preacher; in his sermons he spoke with conscientious frankness, without any regard to worldly considerations. He published a French translation of Sarpi's 'History of the Council of Trent;' an Italian translation of the Bible in 1607, and afterwards a French translation, which was not completed till 1644. Diodati died at Geneva in 1649. He wrote many other works of which Senebier, in his 'Histoire Littéraire de Genève,' gives a catalogue.

DIODO'RUS, a Greek historian born at Agyrium in Sicily. The principal data for the chronology of his life are derived from his own work. He was in Egypt about 60 B.C. His history was written after the death of Julius Cæsar; it ended with the Gallic War of that general, and he spent thirty years in writing it. The title of the great work of Diodorus is the 'Historical Library' (Βιβλιοθήκη Ἱστορική); and it would therefore seem to have been intended by the author as a compilation from all the existing historical works. It was divided into forty books, and comprehended a period of 1138 years, besides the time preceding the Trojan War. The first six books were devoted to the fabulous history anterior to this event, and of these the three former to the antiquities of barbarian states, the three latter to the archæology of the Greeks. In the eleven following books he described the events between the Trojan War and the death of Alexander the Great, and the remaining twenty-three books contained the history of the world to the Gallic war and the conquest of Britain. Diodorus asserts that he travelled over a considerable part of Europe and Asia in order to prosecute his investigations. He resided some time at Rome, and made himself familiar with the Roman historians. Of the forty books of Diodorus's History we possess only fifteen, books i.–v. and books xi.–xx., but we have many fragments of the twenty-five others, to which important additions have recently been made from MSS. in the Vatican library.

The principal fault of Diodorus seems to have been the too great extent of his work. It was not possible for any man, living in the time of Augustus, to write an unexceptionable universal history: nor is it possible now. It is not then a matter of surprise that Diodorus, who does not appear to have been a man of superior abilities, should have made many mistakes, and should have often placed too much reliance on indifferent authorities. Although he professes to have paid great attention to chronology, his dates are frequently incorrect. (Dodwell's 'Annal. Thucydid.' and Clinton's 'Fasti Hellenici,' ii. p. 259, and elsewhere; Niebuhr, 'Hist. Rome,' ii., and note 1281.)

The best editions of Diodorus are Wesseling's,

Amstel., 1745, two vols. fol.; that printed at Deux-Ponts, 1793-1801, and Dindorf's, Lips., 1829-33, five vols. 8vo., which contains the Vatican Excerpta. There is also a smaller edition by Dindorf in four vols. 12mo., Lips., 1826. Diodorus has been translated into French by Terrasson, and two or three years ago a new translation by Miot appeared at Paris. A German translation of Diodorus was begun by F. And. Stroth (1782-1785), and finished by T. F. Sal. Kaltwasser (1786-1787). Amyot translated into French books xi. to xvii. of Diodorus's History. There is an English translation by Booth.

DIŒCIA, the twenty-second class in the artificial method used by Linnæus in arranging plants. All plants having the male flowers on one individual and the female on another are called *diœcious*.

DIO'GENES of Apollonia, so called from his birthplace, a town in Crete, was a pupil of Anaximenes, and a contemporary of Anaxagoras. The birth-year of his contemporary and fellow-pupil Anaxagoras was 500 B.C.

Diogenes followed Anaximenes in making air the primal element of all things, that out of which the whole material universe was formed; but he invested this air with the property of intelligence. Anaxagoras separated mind from matter.

He wrote several books on Cosmology (περὶ Φύσεως); and the first sentence of his work is given by Diogenes Laërtius in two places (vi. 81; ix. 57). The fragments which remain have been recently collected and edited by Panzerbeiter.

There is an essay on the philosophy of Diogenes, by Schleiermacher, in the Memoirs of the Berlin Academy for 1815.

(Diogenes Laertius, ix. 2; Bayle's *Dictionary*.)

DIO'GENES, the Cynic philosopher, was a native of Sinope. His father Hicesius and himself were expelled from their native place on a charge of adulterating the coinage, or, according to another account, Hicesius was thrown into prison and died there, while Diogenes escaped to Athens. On his arrival there he betook himself to Antisthenes, the Cynic, who repulsed him rudely, according to his custom, and even on one occasion threatened to strike him. 'Strike me,' said the Sinopian, 'for you will never get so hard a stick as to keep me from you while you speak what I think worth hearing.' The philosopher was so pleased with this reply, that he admitted him among his scholars. Diogenes was soon distinguished for his neglect of personal conveniences, and by his sarcastic expressions. He dressed in a coarse double robe, which served him as a cloak by day and a coverlet by night, and carried a wallet to receive alms of food. A great number of his witty and biting apophthegms are detailed by his biographer (Diog. Laërt., vi. c. 2). He became acquainted with Alexander the Great, who bade him ask for whatever he wanted. 'Do not throw your shadow upon me,' was the Cynic's only request. Being taken by a piratical captain while sailing from Athens to Ægina, he was carried to Crete, and there sold to Xeniades, of Corinth, who took him home to educate his children. He discharged his duties faithfully and successfully; and he was so well treated by his master that he refused an offer on the part of his friends to ransom him. He died at Corinth in the same year as Alexander the Great (323 B.C.), at the age of 90 years. Numerous works attributed to him are mentioned by Diogenes Laërtius but none of them are extant. [CYNICS.] The following are a few of the opinions ascribed to him by his biographer. He thought exercise (ἄσκησις) was indispensable, and able to effect any thing; that there were two kinds of exercise, one of the mind and the other of the body, and that one of these was of no value without the other. By the cultivation of the mind he did not mean the prosecution of any science or the acquirement of any mental accomplishment; all such things he considered as useless; but he intended such a cultivation of the mind as might serve to bring it into a healthy and virtuous state, and produce upon it an effect analogous to that which exercise produces upon the body. He was of opinion that there should be a community of wives and children.

DIO'GENES, surnamed Laërtius, because he was born at Laërtes, in Cilicia, was the biographer of the Greek philosophers. It is supposed that he lived in the reign of Severus or Caracalla, and that he was an Epicurean. The work by which Diogenes is known is a crude contribution towards the history of philosophy. It contains a brief account of the lives, doctrines, and sayings of most persons who had been called philosophers; and though the author is evidently a most unfit person for the task which he imposed upon himself, and has shown very little judgment and discrimination in the execution, the book is useful as a collection of facts. The article on Epicurus is valuable as containing some original letters of that philosopher, which comprise a pretty satisfactory epitome of the Epicurean doctrines, and are very useful to the readers of Lucretius. The most convenient edition of Diogenes is that by H. G. Hübner, Lips., 1828–31, in two volumes octavo.

DION, of Syracuse, son of Hipparinus, one of the chief men in that city, lived under the reigns of both the Dionysii. He had early become the disciple of Plato, whom the elder Dionysius had invited to Syracuse. Soon after his accession, the younger Dionysius began to show the effects of a vicious education, and he abandoned himself to all kinds of excess. The prospects of his country roused Dion, and he endeavoured to counteract the errors of the tyrant by prudent counsels and exhortations. Among other things he persuaded him to invite Plato to revisit the Syracusan court, and Dionysius wrote a letter of invitation; but the philosopher had not forgotten the treatment which he had received from the tyrant's father, and it was with the utmost difficulty that he was prevailed on to go. The presence of Plato was dreaded by the dissolute courtiers who surrounded Dionysius, and, to counteract his influence, they obtained the recall of Philistus, whose talents and tyrannical tendencies they thought were likely to be a match for the philosopher. The enemies of Dion insinuated suspicions of Dion's loyalty, and succeeded in procuring his banishment. He went first to Italy and then to Greece, where he re-

ceived the highest honours. Dionysius confiscated his lands and effects, and forced his wife to marry another. Dion no sooner heard of this outrage, than he determined to make an effort to expel the tyrant. He began to raise troops privately, and at last assembled his forces to the number of eight hundred in the island of Zacynthus, whence he sailed to Sicily. On landing, he found that Dionysius was absent in Italy and he was received by the people with great joy. Dionysius, on his return to Sicily, made some fruitless attempts to regain his power, but he was forced to quit the island for Italy. Dion however did not long enjoy the favour of his countrymen, and by the influence of Heraclides he was obliged to leave Sicily; he was afterwards recalled, but was treacherously murdered, B.C. 354, at about fifty-five years of age, by his supposed friend Calippus, an Athenian. His death was generally regretted, and a monument was raised to him at the public expense. (Diodorus Siculus, xvi. 6-20; Plutarch, *Dion;* Nepos, *Dion.*)

DION, surnamed *Chrysóstomus*, or the Golden-mouthed, was a sophist and stoic, and a contemporary of the emperors Vespasian, Domitian, Nerva, and Trajan. He resided for some years at Rome, till one of his friends, having engaged in a conspiracy against Domitian, was condemned to death, and Dion, fearing for himself, fled to the modern Moldavia, where he remained till the tyrant's death, labouring for his subsistence with his own hands, and possessing no books but the 'Phædon' of Plato and the Oration of Demosthenes against Æschines for maladministration in the embassy. Dion died at an advanced age, probably in Bithynia, his native country. We have eighty orations attributed to him, which are prettily written, but not of much intrinsic value. The best edition is that of Reiske, 2 vols. 8vo., Lips., 1784.

DION CA'SSIUS COCCEIA'NUS, or Cocceius, was the son of Cassius Apronianus, a Roman Senator, and born at Nicæa in Bithynia about A.D. 155. On his mother's side he was descended from Dion Chrysostom, and it was from this branch of his family that he took the name of Dion. Under Commodus he lived in Rome, where he enjoyed the rank of senator. After the death of Caracalla, he was made governor of Smyrna and Pergamus by Macrinus. He was afterwards consul and proconsul in the several provinces of Africa and Pannonia, probably under Alexander Severus, who esteemed him so highly as to make him consul for the second time with himself. In his old age he returned to his native country.

Dion wrote a history of Rome in Greek, from the arrival of Æneas in Italy and the foundation of Alba and Rome, to A.D. 229. To the time of Julius Cæsar his history was only a rapid sketch, but from that date his narrative is very complete. Of the first 36 books there are only fragments extant: but there is a considerable fragment of the 35th book on the war of Lucullus against Mithridates, and of the 36th, on the war with the Pirates and the expedition of Pompey against Mithridates. The following books to the 54th inclusive are nearly all entire: they comprehend a period from B.C. 65 to B.C. 10, or from the Eastern campaign of Pompeius and the death of Mithridates to the death of Agrippa. The 55th book has a considerable gap in it. The 56th to the 60th, both included, comprehend the period from A.D. 9 to A.D. 54, and the events from the defeat of Varus in Germany to the reign of Claudius. Of the following 20 books we have only fragments, and the meagre abridgment of Xiphilinus. The 80th or last book comprehends the period from A.D. 222 to A.D. 229, in the reign of Alexander Severus. The abridgment of Xiphilinus commences with the 35th, and continues to the end of the 80th book.

The annals of Zónaras contain numerous extracts from Dion, and the fragments have been carefully collected. The history is very valuable as a collection of facts, but it is disfigured by the author's credulity, wherever he has any thing bad to say of any one. He was well acquainted with Roman institutions.

The edition of Dion Cassius by Reimarus, Hamburg, 1751-2, 2 vols. folio, contains a Latin translation and valuable notes. The latest edition is by F. W. Sturz, Leipzig, 1824, 1825, 8 vols. 8vo. There are several German translations of Dion Cassius: the most recent is by F. Lorentz, Jena, 1826, 4 vols. 8vo.

DIONÆA, a most singular herbaceous plant, remarkable for the irritability of its leaves, which, when brushed against by an insect, will suddenly close upon it and hold it fast, whence it is often called Venus's Fly-trap and the Carolina Catchfly Plant. It is botanically related to the *Drosera*, or Sundew, which has also the property of seizing insects by its viscid hairs. The *Dionæa muscipula* is found as far north as Newbern, N. Carolina, and from the mouth of Cape Fear River to Fayetteville. It is found in great plenty for many miles around Wilmington in every direction. The leaf, which is the only remarkable part, springs from the root, spreading upon the ground at a little elevation above it. Each portion of the leaf is a little concave on the inner side, where are placed three delicate hair-like organs, in such an order that an insect can hardly traverse it without interfering with one of them, when the two sides suddenly collapse and inclose their prey, with a force surpassing an insect's attempts to escape. The fringe or hairs of the opposite sides interlace, like the fingers of the two hands clasped together. The sensitiveness resides only in these hair-like processes on the inside, as the leaf may be touched or pressed in any other part without sensible effects.

DIONY'SIA (*Διονύσια*), festivals held in honour of the god Dionýsus, or Bacchus. The most important of such festivals were held at Athens and in Attica, and were the occasions on which all the dramatic exhibitions of the Athenians took place. Both the tragedy and comedy of the Athenians arose ultimately from parts of ceremonies which prevailed in very early times among the Greeks at the festivals of Dionysus (Aristot. 'Poet.,' 4, 14); and it is alike a consequence and a proof of this origin, that the dramatic exhibitions and contests among the Athenians, from the

earliest to the latest times at which we can trace them, always took place at some one of the Attic Dionysia.

These Attic Dionysia were four in number. Enumerated in the order of time, according to the Attic year, they were—1, the Lesser or Rural Dionysia, held in the month Poseideon; 2, the Lenæa, held in the month Gamelion; 3, the Anthesteria, held in the month Anthesterion; and, 4, the Great or City Dionysia, held in the month Elaphebolion. They were held in four consecutive months, the first of which, Poseideon, coincides with part of December and part of January, and the last, Elaphebolion, with part of March and part of April.

Until recently, the number of the Attic Dionysia was always supposed to be three, the fourth being made to disappear by identifying the Lenæa, the second which we have named, either with the Anthesteria or with the Rural Dionysia. But the incorrectness of both these opinions, and the separate existence of the Lenæa, have been established unanswerably by Boeckh, the author of the 'Public Economy of Athens,' in an essay published in 1819 in the 'Transactions of the Berlin Academy of Sciences.'

DIONYSIUS THE ELDER was born at Syracuse about 430 B.C. In the civil troubles of Syracuse, between the party of Diocles and that of Hermocrates, who was accused of aspiring to the supreme power, Dionysius took part with Hermocrates, and was wounded in an attempt which Hermocrates made to take possession of Syracuse. He afterwards married the daughter of Hermocrates. Meantime the Carthaginians had effected their second invasion of Sicily, and had taken Selinus, Himera, and Agrigentum. In an assembly of the people of Syracuse, after the fall of Agrigentum, Dionysius accused the commanders and the magistrates of neglect and treachery. In consequence of this charge, he was condemned to a heavy fine, which Philistus, the historian, paid for him, and he repeated his charges against those at the head of the commonwealth, until he persuaded the people to appoint new commanders, among whom himself was one. His next measure was to obtain the recall of the exiles, to whom he gave arms. Being sent to the relief of Gela, then besieged by the Carthaginians, he effected nothing against the enemy, pretending that he was not seconded by the other commanders, and his friends suggested that, in order to save the state, the supreme power ought to be confided to one man. The general assembly proclaimed Dionysius chief of the republic about 405 B.C. He increased the pay of the soldiers, enlisted new ones, and, under pretence of a conspiracy against his person, formed a guard of mercenaries. He then proceeded to the relief of Gela, but failed in his attack on the Carthaginian camp: he however penetrated into the town, the inhabitants of which he advised to leave it in the night under the escort of his troops. On his retreat he persuaded those of Camarina to do the same. This raised suspicion among his troops, and a party of horsemen, riding on before the rest, raised an insurrection at Syracuse against Dionysius, plundered his house, and treated his wife so cruelly that she died. Dionysius followed close after, forced his way into the city, put to death the leaders of the revolt, and remained in possession of the supreme power. The Carthaginians, being afflicted by a pestilence, made proposals of peace, which were accepted by Dionysius, on condition that they should retain, besides their old colonies, the territories of Agrigentum, Selinus, and Himera; that Gela and Camarina should be restored to the inhabitants, who were to pay tribute to the Carthaginians, and that Messana, Syracuse, Leontini, and the whole eastern divison of the island, as well as the towns of the Siculi, in the interior, should remain independent. Himilico with the Carthaginian army returned to Africa, and Dionysius applied himself to fortify Syracuse, and especially the island Ortygia, which he peopled with his trusty partisans and mercenaries. He took the towns of Leontini, Catana, and Naxus, and subjected them to Syracuse; and he prepared for war against Carthage by collecting men, manufacturing arms, and inventing new engines for besieging towns. The termination of the Peloponnesian War (B.C. 404) had filled the Greek towns of Sicily with emigrants and disbanded mercenaries, many of whom Dionysius enlisted in his service. In the year 397 B.C. he proposed the war, which was unanimously voted by the people. He laid siege to Motya, one of the principal Carthaginian colonies in Sicily, which his brother Léptines attacked by sea. The town was taken, the inhabitants killed or sold, and an immense booty was made. Dionysius reduced also several other towns belonging to the Carthaginians. But a large force under Himilco landed at Panormos; and Himilco, after destroying Messana, advanced towards Syracuse. On arriving at Tauromenium Himilco was stopped by a great eruption of lava from Ætna, and was obliged to march round by the western base of the mountain. Meantime Mago with the Carthaginian fleet defeated the Syracusan fleet off Catana. Himilco encamped under the walls of Syracuse, while his victorious fleet entered the great harbour. A dreadful pestilence breaking out in Himilco's camp, Dionysius, who had received aid from Sparta, attacked the Carthaginians, and burnt most of their ships. Himilco with the remainder escaped to Carthage, having paid secretly a large sum to Dionysius for his forbearance.

Dionysius settled the disbanded mercenaries as colonists at Leontini and Messana, which latter city he rebuilt. Mago, with a new Carthaginian army, having landed in Sicily, 392 B.C., was compelled to re-embark on condition of paying the expenses of the war. Dionysius now proceeded against Rhegium, with which the other towns of Magna Græcia had formed an alliance, while he gained over to his side the Lucanians, and both together defeated the allies, devastated the territories of Thurii, Croton, Caulon, Hipponium, and Locri, and obliged the Greeks to sue for peace. In 387 B.C. he again attacked Rhegium, and took it after an obstinate siege. He sold the surviving inhabitants as slaves, and put their commander to a cruel death.

Dionysius seems now to have aspired to the

dominion of Italy and Sicily. In order to raise money, he plundered several temples, such as that of Proserpina, at Locri. He had no religious scruples: he despised the superstitions of the age. He also landed on the coast of Etruria, and plundered the temple of Cære, or Agylla, of 1000 talents. He was preparing himself for a new expedition to Italy, when a fresh Carthaginian armament landed in Sicily, 383 B.C., and defeated Dionysius, whose brother, Leptines, fell in the battle. A peace followed, of which Carthage dictated the conditions; and the boundary of the two states was fixed at the river Halycus. This peace lasted fourteen years, during which Dionysius remained undisturbed ruler of Syracuse and one-half of Sicily, with part of Southern Italy. He sent colonies to the coasts of the Adriatic. Twice he sent assistance to his old ally, Sparta, once against the Athenians, 374 B.C., and again in 369, after the battle of Leuctra, when the Spartans were hard pressed by Epaminondas. Meantime the court of Dionysius was frequented by many distinguished men. Plato was invited by Dion, the brother-in-law of Dionysius; but the philosopher's declamations against tyranny led to his being sent away from Syracuse. The poets fared little better, as Dionysius himself aspired to poetical glory. Those who did not praise his verses were in danger of being sent to prison. Dionysius twice sent some of his poems to be recited at the Olympic Games, but they were hissed by the assembly. He was more successful at Athens, where a tragedy of his obtained the prize. He had just concluded a fresh truce with the Carthaginians; and he now gave himself up to rejoicings for his poetical triumph. In a debauch with his friends, he fell down senseless, and soon after died; some say he was poisoned, 367 B.C., in the sixty-third year of his age, having been tyrant of Syracuse thirty-eight years. After the death of his first wife he married two wives at once. His elder son, by Doris, succeeded him in the sovereignty.

Dionysius was a clever and successful statesman; he was unscrupulous, rapacious, and vindictive, but several of the stories of his cruelty and suspicious temper appear to be exaggerated. The works of Philistus, who had written his life, and who is praised by Cicero, are lost. Diodorus, who is our principal remaining authority concerning Dionysius, lived nearly three centuries after. The government of Dionysius, like that of many others who are styled tyrants in ancient history, was not a despotism; it resembled rather that of the first Medici and other leaders of the Italian republics in the middle ages, or that of the Stadtholders in Holland.

DIONY'SIUS THE YOUNGER, son of Dionysius the Elder, succeeded him as tyrant of Syracuse. His father had left the state in a prosperous condition, but young Dionysius had neither his abilities nor his prudence and experience. He followed at first the advice of Dion, who invited his friend Plato to Syracuse about 364 B.C. [DION.] After the exile of Dion, Plato urgently demanded of Dionysius the recall of Dion, and, not being able to obtain it, he left Syracuse; after which Dionysius gave himself up to debauchery without restraint. Aristippus, who was then at his court, was the kind of philosopher best suited to the taste of Dionysius. When Dion returned to Syracuse with a small force, and got possession of the city, Dionysius quitted it, and retired to Locri, in Italy, the country of his mother, where he had connections and friends. His partisans however retained possession of Ortygia, and Heraclides, a demagogue, proposed an equal distribution of property, which Dion resisted; but he was compelled to leave Syracuse. In the midst of the confusion, a successful sortie being made by the soldiers of Dionysius, who plundered and burnt part of the city, messengers were despatched to Dion requesting him to return. Dion obeyed the call, repulsed the enemy, and took the citadel. But the faction of Heraclides conspired against Dion, and had him treacherously murdered, 354 B.C.

Several tyrants succeeded each other in Syracuse, until Dionysius himself came and retook it about 346. Dionysius however, instead of improving by his ten years' exile, had grown worse. Upon his return to Syracuse, his cruelty and profligacy drove away a great number of people to various parts of Italy and Greece, whilst others joined Iketas, tyrant of Leontini, and a former friend. Iketas sent to Corinth to request assistance against Dionysius, and the Corinthians appointed Timoleon as leader of the expedition. Timoleon landed in Sicily 344 B.C., notwithstanding the opposition of the Carthaginians and of Iketas, who acted a perfidious part on this occasion; he entered Syracuse, and obliged Dionysius to surrender. Dionysius was sent to Corinth, where he spent the remainder of his life, in the company of actors and low women; some say that at one time he kept a school.

DIONY'SIUS OF CO'LOPHON, a Greek painter in the time of Pericles. His works were known to Aristotle, who, in speaking of imitation, says that it must be superior, inferior, or equal to its model, which he exemplifies by the works of three painters. Polygnótus, he says, painted men better than they are, Pauson worse than they are, and Dionysius as they are. By which we may infer that Dionysius was a good portrait-painter.

There was another painter of this name who lived in Rome about the time of the first Roman emperors. Pliny states that his works filled picture galleries; he was called the Anthropograph, because he painted nothing but men.

(Aristotle, *Poet.*, c. 2; Plutarch, *Timol.*, 36; Aelian, *Var. Hist.*, iv. 3; Pliny, *Hist. Nat.*, xxxv. 37, 40.)

DIONY'SIUS, the son of Alexander, an historian and critic, born at Halicarnassus, in the 1st century B.C. We know nothing of his history beyond what he has told us of himself. He came to Italy in B.C. 29, and he spent the following two-and-twenty years at Rome in learning the Latin language, and in collecting materials for his history. The principal work of Dionysius is his 'Roman Antiquities,' which commenced with the early history of the people of Italy, and terminated with the beginning of the first Punic War, B.C. 264. It consisted of twenty books, of

which the first ten remain entire. The eleventh breaks off in the year 312 B.C., but several fragments of the latter half of the history are preserved in the collection of Constantine Porphyrogennetus, and to these a valuable addition was made in 1816 by Mai, from an old MS. Though Dionysius has evidently written with much greater care than Livy, and has studied Cato and the old annalists more diligently than his Roman contemporary, yet he wrote with an object which invalidates his claim to be considered an impartial historian. Dionysius wrote for the Greeks; and his object was to relieve them from the mortification of being conquered by a race of barbarians, as they considered the Romans to be; and this he endeavoured to effect by twisting and forging testimonies and botching up the old legends, so as to make out a proof of the Greek origin of the city of Rome, and he inserts a great number of set speeches, evidently composed for the same purpose. He indulges in a minuteness of detail which, though it might be some proof of veracity in a contemporary historian, is an indication of a want of faith in the case of an ancient history so obscure as that of Rome. With all his study and research, Dionysius was imperfectly acquainted with the Roman constitution. (Niebuhr, 'Hist. Rom.,' vol. ii. p. 13, Eng. tr.) Dionysius also wrote a treatise on rhetoric, criticisms on the style of Thucydides, Lysias, Isocrates, Isæus, Dinarchus, Plato, and Demosthenes; a treatise on the arrangement of words, and some other short essays. His critical works are much more valuable than his history. The best editions of Dionysius are those of Hudson, Oxon., 1704, 2 vols. fol.; and by Reiske, Lips., 1774–1777, 6 vols. 8vo. Mai's fragments were first published at Milan in 1816, and reprinted the following year at Frankfort. They also appear in the 2nd volume of Mai's 'Nova Collectio,' Rome, 1827. His Rhetoric has been published separately by Schott, Lips., 1804, 8vo. The only English translation of the 'Antiquities' is by Spelman, 2 vols. 4to., London, 1748.

DIONYSIUS of Byzantium lived before the year A.D. 196. His voyage (Ἀνάπλους) in the Thracian Bosporus was extant in the 16th century; for Gyllius, who died in 1555, has given extracts in Latin from it in his work on the Thracian Bosporus. A single fragment from this work is printed in Ducange's 'Constantinopolis Christiana,' and in Hudson's 'Minor Greek Geographers.'

DIONY'SIUS PERIEGE'TES, the author of a Greek poem in 1186 hexameter verses, entitled Τῆς Οἰκουμένης Περιήγησις, or 'A Description of the Habitable World.' He was probably a native of Byzantium, and belonged to the latter part of the third or the beginning of the fourth century A.D. The 'Periegesis' is of no value, either as a poem or a geographical work. The commentary of Eustathius on the 'Periegesis' possesses some value for the miscellaneous information which is scattered through it. There are two Latin translations of this poem, one by Rufus Festus Avienus, and the other by Priscianus. There are numerous editions of Dionysius. The last and best edition of the 'Periegesis' is by G. Bernhardy, Leipzig, 1828, 8vo., in the first volume of his 'Geographi Græci Minores.'

DIONY'SIUS CATO. This is the name given to the author of a Latin work in four books, entitled 'Dionysii Catonis Disticha de Moribus ad Filium.' But the real name of the author is unknown, and also the time when he lived. These Disticha, which are in verse, are short moral precepts intended for the edification of youth.

The style of these Distichs is simple, and the language generally pure. During the middle ages they were much used in schools for the purposes of instruction, both on the continent of Europe and in England, and they have been used in some parts of England even to the present century.

One of the latest and best editions is by Arntzenius, Utrecht, 8vo., 1735. There are several English translations from the Latin, the latest of which perhaps is that of N. Bailey, 8vo., London, 1771.

DIOPHANTUS of Alexandria, the author of the only Greek work which contains algebra. What we have of it is six books of algebraic investigation of the properties of integer numbers, with a book on polygonal numbers. It has been printed, once in Latin only (1575), and twice in Greek and Latin (1621 and 1670). The last edition (Toulouse, 1670, folio) is the best. There is a German translation by Schulz, Berlin, 1822, 8vo. See Dr. Smith's 'Biographical Dictionary,' article *Diophantus*, and that of *Hypsicles*, for what follows:—

The date of Diophantus has been considered very uncertain. The most common opinion was, that he lived in the second century, on the faith of a passage in Theon, which states that Hypatia wrote a commentary on an astronomical work of a certain Diophantus. But Diophantus is rather a common name in Greek literature. Recently, it has been pointed out that Diophantus mentions, and therefore must have lived after, Hypsicles the mathematician, a name which occurs only once. This Hypsicles, it appears from a neglected passage of Suidas, must have lived not earlier than the end of the sixth century; and we must therefore place Diophantus at the beginning of the seventh, at the earliest. The first certain mention of him is in the eighth century.

DIO'PSIS, a genus of dipterous insects of the family *Sepsidæ*. The insects of this genus are remarkable for the immense prolongation of the sides of the head. The head itself is small, and appears as if it were furnished with two long horns, each having a knob at its apex; these horn-like processes however are not analogous to the parts usually termed antennæ, but are in fact prolongations of the sides of the head, the knob at the apex of each being the eye of the insect. These eyestalks vary in length according to the species, and on them, near the eyes, are seated the true antennæ, short and three-jointed.

These insects inhabit the tropical regions of the old world. A very remarkable species (*D. Sykesii*, G. R. Gray) was discovered by Col. Sykes in the Western Ghauts of the Deccan, India. For a de-

tailed account of the species of the genus *Diopsis* we refer to Mr. Westwood's paper in the 17th volume of the 'Transactions' of the Linnæan Society.

DIOPTASE, or Emerald Copper, a crystallised silicate of copper, the primary form of which is a rhomboid; its colour varies from emerald to blackish green; it is translucent, brittle, and has a specific gravity of 3.28.

DIOPTRICS. [OPTICS; REFRACTION.]

DIORA'MA (from the Greek word διορᾶν, to see through), a mode of painting and scenic exhibition invented by two French artists, Daguerre and Bouton. The peculiar and almost magical effect of the diorama arises, in a considerable measure, from the contrivance employed in exhibiting the painting, which is viewed through a large aperture or proscenium. Beyond this opening the picture is placed at such a distance that the light is thrown upon it, at a proper angle, from the roof, which is glazed with ground glass, and cannot be seen by the spectator. The light may be diminished or increased at pleasure, and that either gradually or suddenly, so as to represent the change from ordinary daylight to sunshine, and from sunshine to cloudy weather, or to the obscurity of twilight; also the difference of atmospheric tone attending them. Some parts of the painting are transparent, and on them the light can occasionally be admitted from behind, thereby producing a brilliancy far exceeding that of the highest lights of a picture upon an opaque ground. The combination of transparent, semi-transparent, and opaque colouring, still further assisted by the power of varying both the effects and the degree of light and shade, renders the diorama the most perfect scenic representation of nature. The principle forms the basis of an attractive Exhibition in the Regent's Park, London; but it is also capable of being applied to the embellishments of corridors, &c.

DIOSCOREA'CEÆ, a natural order of endogenous plants.

All the species are twining shrubs, with alternate or spuriously opposite leaves. They consist, with the exception of *Tamus*, or Black Bryony, of tropical plants, or at least of such as require a mild frostless climate. Some of them produce eatable farinaceous tubers; but there is a dangerous acrid principle prevalent among them, which renders the order upon the whole suspicious. The genus *Dioscorea* furnishes the tropical esculents called yams. There are several species of this genus. The common West India Yam, which is often sold in the shops of London, is produced by *Dioscorea alata*. It is met with in the East Indies also, but only in a cultivated state. Its tubers are oblong, brown externally, white internally, and often of great size, weighing sometimes as much as 30 lbs.; they perish after the first year, if left in the ground, having first produced the young ones that are to replace them. *D. globosa*, cultivated in Bengal, is the most esteemed of the Indian yams. Its flowers are highly fragrant; the tubers are white internally; the leaves arrow-headed. *D. rubella* is another Indian sort with large tubers stained with red immediately below the cuticle; it is much esteemed; its tubers are sometimes three feet long; its flowers are fragrant. Another valuable kind is *D. purpurea*, whose tubers are permanently stained purple throughout. At Malacca is cultivated another purple-rooted sort, the *D. atropurpurea*, whose tubers are large and irregular, and grow so near the surface of the ground as to appear in dry weather through the cracks that they make in the soil by raising the earth over them. Other eatable sorts are numerous, but are less valuable, and therefore not cultivated. In Otaheite the *D. bulbifera*, which bears small fleshy angular tubers along the stem in the axils of the leaves, is the favourite species.

It is not a little remarkable that, while so many species are nutritious in this genus, some should be highly dangerous; but such is unquestionably the fact.

DIOSCO'RIDES, PEDA'CIUS, or PEDA'NIUS, a Greek writer on Materia Medica, was born at Anazarbus, in Cilicia, and flourished in the reign of Nero, as appears from the dedication of his books to Areus Asclepiadeus, who was a friend of the consul Licinius or Lecanius Bassus. In early life he seems to have been attached to the army; and either at that time or subsequently he travelled through Greece, Italy, Asia Minor, and some parts of Gaul, collecting plants with diligence, and acquainting himself with their properties, real or reputed. He also gathered together the opinions current in his day concerning the medical plants brought from countries not visited by himself, especially from India, which at that time furnished many drugs to the western markets. From such materials he compiled his celebrated work on Materia Medica, in five books, wherein between 500 and 600 medicinal plants are named and briefly described. He is moreover reputed the author of some additional books on therapeutics, &c.; but in the judgment of Sprengel the latter are spurious, and, from the mixture of Latin and Greek names of plants, are probably some monkish forgery.

Few books have ever enjoyed such long and universal celebrity as the 'Materia Medica' of Dioscorides. For sixteen centuries and more, to use the words of one of his biographers, this work was referred to as the fountain-head of all authority by every body who studied either botany or the mere virtues of plants. Up to the commencement of the seventeenth century the whole of academical or private study in such subjects was begun and ended with the works of Dioscorides; and it was only when the rapidly increasing numbers of new plants and the general advance in all branches of physical knowledge compelled people to admit that the vegetable kingdom might contain more things than were dreamt of by the Anazarbian philosopher, that his authority ceased to be acknowledged.

The most celebrated MS. of Dioscorides is one at Vienna, illuminated with rude figures. It was sent by Busbequius, the Austrian Ambassador at Constantinople, to Mathiolus, who quotes it under the name of the Cantacuzene Codex, and is believed to have been written in the sixth century. Copies of some of the figures were inserted by

Dodoens in his 'Historia Stirpium,' and others were engraved in the reign of the Empress Maria Theresa under the inspection of Jacquin. Two impressions only of these plates, as far as we can learn, have ever been taken off, as the work was not prosecuted. One of them is now in the Library of the Linnæan Society; the other is, we believe, with Sibthorp's collection at Oxford. They are of little importance, as the figures are of the rudest imaginable description.

The first edition of the Greek text of Dioscorides, was published by Aldus at Venice, in 1499, fol. A far better one is that of Paris, 1549, in 8vo., by J. Goupyl; but a better still is the folio Frankfort edition, of 1598, by Sarracenus. Dr. Sibthorp, who visited Greece for the purpose of studying on the spot the Greek plants of Dioscorides, must be accounted of the highest critical authority; for it frequently happens that the traditions of the country, localities, or other sources of information throw far more light upon the statements of this ancient author than his own descriptions. It will ever be a subject of regret to scholars, that Dr. Sibthorp should have died before he was able to prepare for the press the result of his inquiries; what is known of them is embodied in the 'Prodromus Floræ Græcæ,' published from his materials by the late Sir James Edward Smith, and in the 'Flora Græca' itself, consisting of 10 vols. fol. with nearly 1000 coloured plates, commenced by the same botanist, and completed under the direction of Professor Lindley.

DIOSCU'RIDES, a gem engraver who lived at Rome about the time of the Emperor Augustus. There are still several gems extant which bear the name of Dioscurides, but the genuineness of most of them has been questioned; a few of them however are beautifully finished, and are perhaps worthy of the reputation of the greatest gem engraver of antiquity, a reputation which Dioscurides had, according to Pliny (*Hist. Nat.*, xxxvii. 4).

DIOSMA, a genus of rutaceous shrubs inhabiting the Cape of Good Hope. The flowers of most of the species are white; those of a few are red. *Diosma crenata* (Linn.) and *Diosma serratifolia* (Vent.) yield leaves which at the Cape of Good Hope are termed buchu, or bucco, and which are some times used alone, but more frequently mixed. When bruised, they emit a strong peculiar odour, resembling rosemary or rue. The taste is aromatic, but not bitter or disagreeable. The volatile oil and the extractive appear to be the active ingredients. They are usually administered in the form of infusion. Buchu leaves have been long known to the Hottentots as a remedy against rheumatism, cramps, and above all in affections of the urinary organs. They have of late years been introduced into European practice. In their action they resemble those of the *Arctostaphylos Uva Ursi*, but, from their containing volatile oil, buchu leaves are in many cases preferable. [Beal's Whortleberry.]

DIO'TIS (double-eared, from δίς, twice, and ὠτός, ὠτος, an ear), a genus of plants belonging to the natural order *Compositæ*. *D. maritima* is the only British species. It is found on sandy seashores, but is a rare plant. *Diotis* is adopted by some botanists as the name of a genus of plants belonging to the *Chenopodiaceæ*, the *Axyris ceratoides* of Linnæus.

DIP of a Magnetised Needle. [Inclination; Magnetism.]

DIPHUCE'PHALA, a genus of coleopterous insects belonging to the *Lamellicornes*, section *Phyllophagi*. This genus appears to be confined to Australia, and the species of which it is composed are distinguished from those of allied genera chiefly by their having the clypeus deeply emarginated. A rich golden green appears to be their prevailing colour. For a monograph of the genus *Diphucephala*, see the first volume of the 'Transactions' of the Entomological Society of London. Sixteen species are there described.

DIPHTHONG (δίφθογγος) is the sound of two vowels pronounced in rapid succession, as the German *au* in *maus*, pronounced precisely like English word *mouse*, the vowel sound consisting of the broad *a* of *father*, followed quickly by the sound of *u* or *oo*. The *i* in the English word *mind* consists of two vowel sounds. The name diphthong however is commonly given to any vowel sound represented by the junction of two vowels, as in *dream*, though the sound produced is not compounded.

All diphthongs are said to be long syllables; and this would be true, if they were only employed to mark the union of two vowel sounds. This probably was originally their sole office; for in many English words now written with diphthongs, but pronounced as if they had single vowels, an earlier pronunciation contained the double sound; and indeed this view is often supported by the provincial pronunciation of a word. For example, such words as *meat*, *dream*, are pronounced in many parts of England as dissyllables, *meät*, *dreäm*. In practice however a diphthong is often used where the vowel sound is not only uncompounded, but short, as in *friend*, *breadth*.

Again, diphthongs are occasionally used to represent simple sounds intermediate between the vowels, as in the English word *cough*, and the German sounds represented by *ae*, *oe*, *ue*, commonly written *ä*, *ö*, *ü*, where the dots placed over the vowels are merely a corruption of the letter *e*.

DIPHYDES, DI'PHYDÆ, a group or section of the class Acalephæ, placed by De Blainville between the *Physograda* and the *Ciliograda*. Cuvier assigns this group to his second order of *Acalephæ*, termed 'Les Acalèphes Hydrostatiques,' as the concluding series of the class.

The *Diphydæ* constitute a singular order of marine creatures, the true nature of which is enveloped in considerable obscurity. The body consists of two distinct portions, or individuals, one of which, viz. the posterior, is fitted into a cavity or hollow receptacle of the other or anterior portion; but so slight is the union between them that they fall asunder at the slightest touch. These two parts are more or less dissimilar in form, and from the bottom of the nucleus of the receiving individual (l'emboîtant) emerges a long cirrhiform appendage which traverses a demi-canal of the received portion (l'emboîté). The structure is sub-

cartilaginous and transparent, and in both portions is ordinarily to be seen a cavity more or less funnel-shaped, which opens externally by a wide and regular but diversiform aperture. It is by the alternate dilatation of these cavities, the water at each contraction being thrown smartly out, that the animal is propelled along. The anterior part contains moreover a proboscidiform œsophagus (with a mouth having a cupping-glass margin), continuing itself into a stomach surrounded with green hepatic granules. Besides this, there may be remarked at the lower parts a glandular mass, which is probably the ovary, and is in more or less immediate relation with the cirrhigerous and perhaps oviferous production, which is prolonged backwards.

'The *Diphyes*,' says De Blainville, 'are very transparent animals, so that it is often very difficult to distinguish them in the sea, and even in a certain quantity of water taken from it. It is especially at considerably great distances from the shore that they are met with in the seas of warm climates, and they are often very numerous. They float and swim apparently in all directions with the anterior or nucleal extremity foremost, getting rid of the water which they take in, by the contraction of the two subcartilaginous parts; their aperture is consequently always directed backwards. When the two natatory organs are equally provided with a special cavity, it is probable that locomotion is more rapid; it can, in fact, be executed by either the one or the other in proportion to their size. The posterior part is attached to the nucleus with so little solidity, that it often becomes detached accidentally: hence M. Botta believed that an entire *Diphyes* was only formed by one of these parts, he having but rarely found the animals complete. During locomotion the cirrhigerous and oviferous production apparently floats extended backwards, lodging itself partly in a gutter into which the inferior edge of the posterior natatory organ is hollowed out, but it has not the same length—the animal being able to contract it powerfully, even to the extent of withdrawing it inwards entirely; from which it is evident that this organ is muscular. But what is very remarkable is, that throughout its length, and placed at sufficiently regular distances, are found organs which MM. Quoy and Gaimard regarded as suckers, and which possessed in fact the faculty of adhesion and bringing the animal to anchor. M. De Blainville remarks, 'I dare not decide what this organ is; but I am strongly inclined to believe, either that it is a prolongation of the body analogous to that in the *Physsophoræ* (*Physograde Acalephæ*), or that it is, if not an ovary, at least an assemblage of young individuals, a little like what takes place in the *Biphores*' (class *Tunicata*).

M. De Blainville arranges the *Diphydæ* as follows:—

1. Diphydæ whose anterior part has but a single cavity. Genera, *Cucubalus*, *Cucullus*, *Cymba*, *Cuboïdes*, *Enneagona*, *Amphiroa*.

2. Diphydæ whose anterior part is furnished with two distinct cavities. Genera, *Calpe*, *Abyla*, *Diphyes*.

3. Doubtful species, or those with one part only. Genera, *Pyramis*, *Praia*, *Tetragona*, *Sulculeolaria*, *Galeolaria*, *Rosacea*, *Noctiluca*, *Doliolum*.

Among the writers on these singular animals whose works may be consulted, we may notice Cuvier, 'Règne Animal,' vol. iii. 1830. MM. Quoy and Gaimard, 'Annales des Sciences Naturelles,' tome x.; and 'Astrolabe Zoolog.,' tome iv.; M. De Blainville, 'Actinology;' 'Manual.' We need not say that the knowledge we possess relative to the structure and affinities of the *Diphydæ* is very incomplete; in fact there are certain genera or forms placed by some in this group the very nature of which is doubtful: such are *Cupulites*, Quoy and Gaimard; *Polytoma*, Quoy and Gaimard; *Tetragona*, Quoy and Gaimard, 'Zool. of the Uranie;' *Racemis*, Della Chiaje.

DIPLACA'NTHUS, a genus of fossil placoid fishes, from the old red sandstone of Scotland. Four species. (Agassiz.)

DIPLEU'RA, a genus of Trilobites, proposed by Green.

DIPLOCTE'NIUM, a fossil genus of lamelliferous corals, allied to Turbinolia, from Maastricht.

DIPLODA'CTYLUS, a genus of Lizards, established by Mr. Gray, and belonging to the family of *Geckos* (Gecko; Geckotidæ). Example, *Diplodactylus vittatus*. Locality, New Holland. ('Proceedings of Zoological Society,' 1832.)

DI PLODUS, a genus of fossil placoid fishes, from the coal formation and mountain limestone. (Agassiz.)

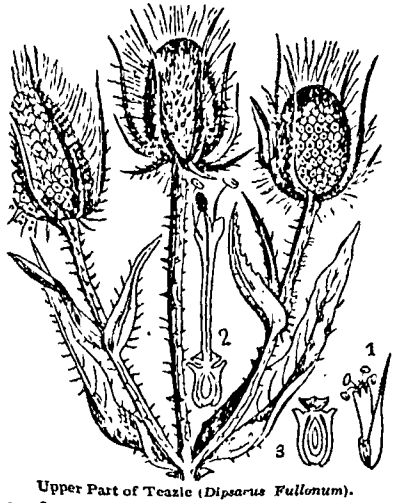
DIPLOMACY is a term used either to express the art of conducting *negotiations* and arranging treaties between nations, or the branch of knowledge which regards the principles of that art, and the relations of independent states to one another. The word comes from the Greek diplóma, which properly signifies any thing doubled or folded, and is more particularly used for a document or writing issued on any more solemn occasion, either by a state or other public body, because such writings, whether on waxen tablets or on any other material, used anciently to be made up in a folded form. For the rights and duties of the several descriptions of functionaries employed in diplomacy, see Ambassador and Consul.

DIPLOMATICS, from the same root as diplomacy, is a term used to express the acquaintance with ancient documents of a public or a political character, and especially of the determination of their authenticity and their age. But the adjective, diplomatic, is usually applied to things or persons connected not with diplomatics, but with diplomacy. Thus by diplomatic proceedings we mean proceedings of diplomacy; and the *corps diplomatique*, or diplomatic body, at any court or seat of government, means the body of foreign agents engaged in diplomacy that are resident there.

DIPLO'PTERUS, a genus of fossil placoid fishes, from the old red sandstone of Scotland, three species; and from the coal shale of Leeds, one species. (Agassiz, in *Report to British Association*, 1842.)

DIPLOTAXIS (from διπλοῦς, double, and τάξις), a genus of plants belonging to the natural order *Crucifera*. The species are herbaceous plants, natives of Europe and the temperate parts of Asia and Africa. There are two British species: *D. tenuifolia*, with a leafy branched glabrous stem, shrubby below; and *D. muralis*, with an herbaceous simple hispid stem.

DIPSA'CEÆ, a small natural order of exogenous plants, with monopetalous flowers, nearly allied to *Compositæ*. None of the species are of any importance except the common Teazle, *Dipsacus Fullonum*, whose prickly flower-heads are extensively employed in carding wool. [TEAZLE.] Many of the species have handsome flowers.



Upper Part of Teazle (*Dipsacus Fullonum*).

1, a flower; 2, a corolla, with two of the stamens, and the ovary containing a pendulous ovule much magnified; 3, a longitudinal section of a fruit, with the pendulous seed and the inverted embryo.

DIPSAS (Laurenti), *Bungarus* (Oppel), a genus of serpents placed by Cuvier under the Colubrine section, and thus characterised:—Body compressed, and much less than the head; scales of the spinal rows of the back larger than the others. Example, *Dipsas Indica*, Cuvier; *Coluber bucephalus*, Shaw. Locality, India. Body very slender and long; tail extremely attenuated; colour black, annulated with white.

Dr. Leach has applied the term Dipsas to a genus of fresh-water conchifers, placing it between *Unio* and *Anodonta* (Anodon); *Unio*, of Sowerby; *Naïades* of Lea. [NAIADES.]

DI'PTERA, one of the orders into which insects are divided. This name was first applied by Aristotle, and has subsequently been adopted by almost all entomologists to designate those insects the most striking character of which is the possession of two wings only. The common fly and the gnat are examples in point. There are however among the Diptera some species destitute of wings, as those of the genera *Melophagus*, *Nycteribia*, &c. ('Règne Anim.,' vol. v. p. 544 5). Hence the notice of a few other peculiarities exhibited by the Diptera is requisite.

The Diptera have six legs furnished with five-jointed tarsi, a proboscis, two palpi, two antennæ, three ocelli, and two halteres, or poisers. The wings are generally horizontal in their position, transparent, with nervures not very numerous and for the most part longitudinally disposed. The proboscis is situated on the under part of the head; it consists of a sheath (or part analogous to the under lip or labium in mandibulate insects) serving to keep in situ other parts of the mouth, which when they are all present represent the mandibles, maxillæ, tongue, and labium. There are however considerable modifications in the structure of the proboscis; in some it is long, slender, corneous, and sharp, the number of inclosed pieces varying from two to six. The proboscis is a suctorial organ, and in many instances a piercing instrument also, as in the instance of the gnat or mosquito. The palpi are situated at the base of the proboscis. The antennæ are placed on the fore part of the head, and approximate at their base: they are generally small and three-jointed; but in some, as the *Tipulidæ*, they are long and composed of many joints; and in the *Culicidæ* they resemble little plumes. The eyes are generally large, especially in the males. The halteres, or poisers, are two small organs of a slender form, and furnished with a knob at their apex, situated at the base of the thorax on each side, and immediately behind the attachment of the wings. Their use is not decidedly ascertained.

Dipterous insects undergo what is termed a *complete* transformation, the females producing eggs. To this rule however there are exceptions, for many change their skin before they assume the pupa state; and in some species of the genus *Sarcophaga* the eggs are hatched within the body of the mother, and are produced in the larva state; while in the *Pupipara*, not only are the eggs hatched within the body of the parent, but the larvæ continue to reside there until their transformation into pupæ.

(*Règne Anim.*, vol. v. p. 428, et seq.; Wiedmann's *Diptera Exotica;* Meigen's *Systematische Beschreibung der Bekannten Europäischen Zweiflügelingen Insecten*, 6 vols. 8vo.; Macquart in the *Suites à Buffon, Histoire des Insectes.*)

DIPTERA'CEÆ, or DIPTEROCARPEÆ, an order of exogenous polypetalous trees, allied to *Malvaceæ*.

The different species produce a number of resinous, oily, and other substances; one a sort of camphor (*Dryobalanops*); another a fragrant resin; a third Gum Animi; while some of the commonest pitches and varnishes of India are procured from others.

The flowers of *Dipterocarpus* are large, white or pink, and deliciously fragrant. The pubescence is always stellate when present. The resinous juice of *D. trinervis*, a tree from 150 to 200 feet high, inhabiting the forests of Java, is made into plasters for ulcers and foul sores; and when dissolved in spirit of wine, or formed into an emulsion with white of egg, acts upon the mucous mem-

branes in the same way as balsam of copaiva. *Dryobálanops camphora*, the Camphor Tree of Sumatra, is usually referred to this genus, but, according to Blume, is really a distinct genus.

DI'PTERUS, a genus of fossil fishes, from the old red sandstone of Caithness and Herefordshire. (*Geol. Trans.*, 2nd series, vol. iii.)

DIPYRE, or *leucolite*, a silicate of alumina and lime, which occurs in small slender prisms of a grayish colour; lustre vitreous, opaque; specific gravity, 2.6.

DIRCA, an American genus of plants belonging to the natural order *Thymelaceæ*, with a single species, the *D. palustris*, which is remarkable for growing in watery places. It is found in the low woods of North America, bearing the severest cold and the greatest heat of the various parts of the United States. The fruit is a small, oval, acute, red, one-seeded berry. This plant is in all its parts very tough, and the twigs are used for making rods, the bark for ropes, baskets, &c. The bark is acrid, and in doses of six or eight grains it produces heat in the stomach, and brings on vomiting. It also acts as a vesicatory when applied to the skin, and in small doses as a cathartic. The fruit possesses narcotic properties, and produces effects upon the system similar to those of Stramonium.

DIRECT and RETROGRADE, two astronomical terms, the former of which is applied to a body which moves in the same direction as all the heavenly bodies except some comets; the second to one which moves in a contrary direction. The motion of the planets round the sun, of the satellites round their primaries, and of the bodies themselves round their axes, all take place in one direction, with the exception only of the comets, of which about one-half the whole number move in the contrary direction. The course of these celestial motions is always from west to east, which is the *direct* course. The *retrograde* is therefore from east to west. In the seventeenth century, the direct motion is said to be *in consequentia*, and the retrograde *in antecedentia*. The most simple way of remembering direct motion is by recalling to mind the order of the signs of the zodiac.

DIRECTION, a relative term, not otherwise definable than by *pointing* out what constitutes sameness and difference of direction. Any two lines which make an angle point in different directions; a point moving along a straight line moves always in the same direction. Permanency of direction and straightness are equivalent notions. A body in motion not only changes its direction with respect to other bodies, but also the direction of other bodies with respect to it.

DIRECTOIRE EXECUTIF was the name given to the executive power of the French republic by the constitution of the year 3 (1795), which constitution was framed by the moderate party in the National Convention, or supreme legislature of France, after the overthrow of Robespierre. [COMMITTEE OF PUBLIC SAFETY.]

Upon Bonaparte's gaining the ascendancy, the constitution of the year 3 and the directory were overthrown, after four years' existence.

(*Histoire du Directoire Exécutif*, 2 vols. 8vo., Paris, 1802.)

DIRECTRIX (*Linea directrix*, a directing line). This term is applied to any line (straight or curved) which is made a necessary part of the description of any curve, so that the position of the former must be given before that of the latter is known.

DIRGE, in Music, a hymn for the dead. This word is a contraction of *Dirige*, the first word of a Catholic funeral chant.

DISABILITY is a term used to express a legal incapacity, which may be either an incapacity to take or to have, which is the ordinary use of the term, or an incapacity to act.

DISA'STER, a subdivision of Echinodermata, including *Spatangus ovalis* of Phillips. From the oolite. (Agassiz.)

DISBUDDING, in Horticulture, consists in removing the buds of a tree before they have had time to grow into young branches. It is a species of pruning which has for its object not only training, but also economy with regard to the resources of a tree, in order that there may be a greater supply of nourishment for the development of those buds which are allowed to remain. If the roots are capable of absorbing a given quantity of nutritive matter for the supply of all the buds upon a stem, and if a number of those buds be removed, it must be evident that those which remain will be able to draw a greater supply of sap and grow more vigorously than they otherwise would have done. This fact has furnished the idea of disbudding.

This kind of pruning has been chiefly applied to peach and nectarine trees; but the same principle will hold good with all others of a similar description, and might be practised upon them if they would repay the labour so expended.

DISC (*discus*, *δίσκος*) is used for the face of a circular plate, and frequently for a thin plate of any substance. Thus we speak of the sun's disc (referring to the appearance of the sun), and also of a disc of metal.

DISCIPLINE, MILITARY, the series of duties which are to be performed by military men. It also signifies a conformity to the regulations by which those who serve in the army are governed in all matters relating to the practice of their profession.

DISCLAIMER. This word has various meanings; but those in ordinary use are the following:—

In a suit in Chancery, a defendant, in his answer to the complainant's bill, may disclaim all interest in the matter in question.

If an estate is given by deed or will to a person, he may by deed disclaim all interest under it.

An executor is said to disclaim when he renounces probate of the will of his testator; and this is generally effected by verbal renunciation before some judge spiritual, or by simple writing under his hand, and in either case the disclaimer is recorded in the spiritual court. If the will contains a devise of lands to the executor, the disclaimer is generally made by deed.

DISCO'BOLI, the third family of the subbrachial malacopterygious fishes of Cuvier. The

distinguishing character is the presence on the under surface of the body of a sucking disc composed of the united ventral fins. The most common and most remarkable species inhabiting the British seas is the Lump-Sucker (*Cyclopterus Lumpus*), often seen conspicuously exposed in the shop of the fishmonger. As other British examples we may mention the Cornish Sucker (*Lepidogaster Cornubiensis*, Flem.), the Bimaculated Sucker (*Lepidogaster bimaculatus*, Flem.), the Unctuous Sucker or Sea-Snail (*Liparis vulgaris*), and Montagu's Sucking-Fish (*Liparis Montagui*, Flem.) (Yarrell's 'British Fishes,' vol. ii.) The Remora, also called a Sucking-Fish, belongs to another family (*Echeneidæ*) of the same order. Cuvier however places the genus *Echeneis* at the end of the family *Discoboli*, while at the same time he expresses his conviction that it ought to constitute a distinct family section. (*Règne Anim.*, vol. ii. p. 344, et seq.)

DISCOI'DEA, a genus of Echinodermata, in which are ranked, by Gray and Agassiz, several species generally referred to in works on organic remains under the title of *Galerites*. They belong to the chalk, greensand, and oolite.

DISCORD, in Music, a sound which, when heard with another, is disagreeable to the ear, unless treated according to the rules of art. Discords are the 2nd, sharp 4th, flat 5th, minor or flat 7th, and major or sharp 7th. The ratios of these, or the relative vibrations of the two notes heard together, are as 9 to 8, 45 to 32, 64 to 45, 9 to 5, and 15 to 8. The treatment of discords, so as to make them available in musical compositions, forms an important part of the theory of harmony. [Acoustics.]

DISCOUNT, a sum of money deducted from a debt in consideration of its being paid before the usual or stipulated time. The circumstance on which its fairness is founded is, that the creditor, by receiving his money before it becomes due, has the interest of the money during the interval. Consequently he should only receive so much as put out to interest, during the period in question, will realise the amount of his debt at the time when it would have become due. For instance, 100*l.* is to be paid at the end of three years; what should be paid now, interest being 4 per cent.? Here it is evident that, if we divide the whole debt into 112 (or $100 + 3 \times 4$) parts, 100 of these parts will make the other 12 in three years (at simple interest), whence the payment now due is the 112th part of 10,000*l.*, or 89*l.* 5*s.* 9*d.* In practice, it is usual not to find the real discount, but to allow interest on the whole debt in the shape of abatement. Thus it would be considered that, in the preceding example, three years' discount upon 100*l.* at 4 per cent. is 12*l.*, or 88*l.* would be considered as the present value.

In transactions which usually proceed on compound interest, as in valuing leases, annuities, &c., the principle of discount is strictly preserved.

The name of discount is also applied to certain trade allowances upon the nominal prices of goods. In some branches of trade these allowances vary according to the circumstances which affect the markets, and what is called discount is in fact occasioned by fluctuations in prices which it is thought convenient to maintain nominally at unvarying rates.

The term discount is also employed to signify other mercantile allowances, such for example as the abatement of 12 per cent. made upon the balances which underwriters, or insurers of sea-risks, receive at the end of the year from the brokers by whom the insurances have been effected. The word discount is further used, in contradistinction to premium, to denote the diminution in value of securities which are sold according to a fixed nominal value, or according to the price they may have originally cost. If, for example, a share in a canal company upon which 100*l.* has been paid is sold in the market for 98*l.*, the value of the share is stated to be at 2 per cent. discount.

DISCUS (*δίσκος, discos*), a quoit of stone, brass, or iron, with which the Greeks and Romans diverted themselves in the public games. The word is Greek. The discus, when perforated like our modern quoit, was thrown by the help of a thong, put through the middle of it. It was at other times of a solid piece, and was then hurled directly from the hand. This last method is illustrated by the statue of the Discóbolus, or Quoit Thrower, attributed to Myro, an ancient copy of which is among the marbles of the Townley Gallery.

The term discus was likewise applied to circular shields or bucklers, of a large size, placed in the temples, on which great actions were represented, or the names of those who had devoted themselves to the service of their country inscribed.

DISK, a term in Botany signifying any ring or whorl of glands, scales, or other bodies that surround the base of an ovary, intervening between it and the stamens. In its most common state it is a fleshy wax-like ring, as in the orange; it frequently forms a yellowish lining to the calyx, as in the plum and cherry, and not unfrequently rises up like a cup around the ovary, as in the tree-pæony. The latter renders it probable that the disk is nothing but an inner whorl of rudimentary stamens.

DISLOCATION. Various parts of the body are liable to be displaced by the direct application of violence or by more gradual causes. But the term *dislocation* is commonly appropriated to displacements occurring about the joints.

The injuries classed under this title may be effected by external violence, or by the undue contraction of muscles, or by both of these causes combined; and they result in some instances from disease within the joints themselves, by which their ligaments are weakened or destroyed, and their sockets rendered insecure by ulceration and other gradual changes.

When, by the protrusion of the bone through the skin or otherwise, the dislocation is complicated with an external wound exposing the cavity of the joint, it is said to be *compound:* and, as in the parallel case of fracture, this aggravation of the injury is very serious, and the most skilful management is required to save the life or limb,

where the injury happens to one of the larger joints.

The particular dislocation takes its name either from the joint itself or from the furthest bone; and various terms are added to indicate the direction of the displacement, or the new situation of the head of the bone. Thus the most common form of the accident at the hip is called 'a dislocation of the head of the *femur*' (thigh-bone) '*backwards* upon the *dorsum ilii*' (flat part of the haunch-bone).

Any bone may be displaced in any direction, but the accident happens most frequently in those joints and directions in which the extent of motion is the greatest. Thus the most common dislocation is that of the shoulder, which is the most moveable joint; and its most frequent variety is that in which the head of the *humerus* (or bone of the upper arm) is drawn downwards into the *axilla* (or arm-pit) by the sudden contraction of certain strong muscles. This happens when the arm is raised to the utmost, as in reaching to close a window; that is, when it has moved through an angle of 180 degrees from its natural position.

The jaw is sometimes thrown out of joint by the mere act of yawning. This distressing but irresistibly ludicrous accident may be relieved immediately by any bystander wrapping a napkin round his thumbs and placing them firmly against the back teeth, so as to press them downwards, while with the fingers and palms the chin is steadily raised and pushed backwards. But the operator should be on the alert to withdraw his hands the moment the jaw snaps back into its place, or he may receive a very unpleasant intimation of the success of his efforts.

The reduction of a dislocated bone is effected by a process technically called *extension*, consisting in the application of force in a proper direction, and steadily kept up till the muscles are fatigued. The head of the bone is thus drawn down a little below the level of the joint, and, being lifted over the edge of the socket, slips easily into its place upon slightly relaxing the extending force. This force is often required to be very considerable, as in dislocation of the hip, and in such cases it is customary to make use of a block of pullies, the bone which contains the socket having been first securely fixed to a staple in the wall by proper bandages. It is sometimes necessary to favour the relaxation of the muscles by emetics, warm baths, and bleeding, and it is reckoned a point of good management to call off the attention of the patient during the extension by annoying him with questions and even exciting him to anger.

The most dangerous dislocations are those of the vertebræ or bones of the spine, because in that case all the parts of the body below the injury are paralysed. But the vertebræ are so curiously locked together, and have singly so little motion, and are at the same time so well supported by ligaments and muscles, that they are seldom dislocated unless by a force sufficient to break as well as to displace them. Such an injury is almost always fatal, and instantly so in general when it takes place above the origin of the nerves of respiration, that is, above the fourth vertebra of the neck. The object of the executioner in hanging a criminal is to produce this effect, but he more often fails than succeeds.

DISPART, in Gunnery, is the difference between the semi-diameter of the base-ring at the breech of a gun, and that of the ring at the swell of the muzzle. The dispart subtends, at the base of the gun, an angle equal to that which, in a vertical plane passing through the axis of the bore, would be contained between that axis and a line (called the line of metal) drawn from the circumference of the base to that of the muzzle. In a 24-pounder gun, 9 feet long for example, the dispart is equal to 2.735 inches, and the angle subtended by it is equal to 27′ nearly; allowance must consequently be made for this value in pointing the gun by the line of metal.

In order to place the axis of the bore at any angle with a horizontal plane, a 'tangent scale' is employed [ORDNANCE]; and, in determining the graduations of this scale, it is manifest that the length of the part raised out of the groove in the base of the gun should (the length of the gun being considered as the radius) be equal to the difference between the tangents of the proposed angle of elevation and the angle of the dispart, in order that, on lowering the base of the gun till a line joining the top of the scale and the top of the muzzle is parallel to the horizon, the axis of the bore may be correctly elevated.

DISPENSARY, an institution supported by voluntary contributions for the supply of the poor with medical and surgical advice, and with medicines gratuitously. Institutions of this kind are of very recent origin. They differ from hospitals in this, that the sick, when too ill to attend personally at the institution, are visited at their own homes by the medical officers of the charity. The medicines, which are commonly purchased in considerable quantities at a time and at wholesale prices, are dispensed in unexpensive forms, and in this manner the extent of the relief afforded is great, while the cost is trifling. No other kind of charity affords so much real assistance at so small an expense, and perhaps fewer objections apply to this than to any other mode of giving eleemosynary aid to the poor. Its peculiar excellence is that it enables the sick poor to obtain advice on the very first day of their illness.

DISPENSATION (Law). The only kind of dispensation now used is that by which the bishop of a diocese licenses a clergyman within his jurisdiction to hold two or more benefices according to their value, or to reside out of the bounds of his parish, or dispenses with some other particular of his strict duty.

DISPERSION. [LIGHT.]

DISPOSITION, in the law of Scotland, is the name given to any unilateral writing, or, as it might be termed in England, deed poll, by which a party solemnly makes over to another a piece of property heritable (real) or moveable. When a new feu or fief is created, it is by charter; but, when a fief is transferred from one holder to another, it is by disposition. As heritable pro-

perty cannot be bequeathed by testament in Scotland, the usual form of family settlements in which such property is disposed of is by Disposition.

DISSECTION, the art of separating the parts of organised bodies in such a manner as to display their structure. It is an art equally applicable to both divisions of the organic kingdom, and indispensable alike to the discovery of the structure of plants and animals.

DISSEN, GEORG LUDOLF, an eminent German scholar, was born on the 17th of December, 1784, at Grossen-Schneen, near Göttingen, where his father was pastor. He was educated at the celebrated school at Pforta in Saxony, where he laid an excellent foundation for his future philological studies; and, notwithstanding his delicate and weakly appearance, he enjoyed excellent health. In 1804 he went to the university of Göttingen, where until the year 1808 he devoted himself to the study of philology and philosophy under Heyne and Herbart. In 1812 he accepted the offer of an extraordinary professorship of Classical Philology in the University of Marburg; and in the autumn of 1813 he accepted an invitation as extraordinary professor of Classical Literature in the University of Göttingen, and in 1817 he was appointed ordinary professor. Incessant study and a secluded life had already impaired the health of Dissen, but his activity as a lecturer was still very great. His lecture-room was always filled, and he succeeded in inspiring his audience with an ardent love of the study of antiquity. The zeal with which he devoted himself to his professional duties and the cultivation of his own mind prevented his doing much as an author: and all that was published by him during the period from 1815 to 1825 consists of the part he took in Boeckh's great edition of Pindar, and some reviews which he wrote for the 'Göttinger Gelehrten Anzeigen.' His new edition of Pindar appeared in 1830, in 2 vols. 8vo.; and a second edition, with some improvements, was published by Schneidewin in 1843. His edition of Tibullus is perhaps his best work. He died in September 1837.

Dissen was never married. He supported with paternal care several young men of talent whose fathers had been his friends during their lifetime. He was a man of great sensibility, enthusiastic for every thing great and noble, and capable of the most devoted friendship, though in his social intercourse he seldom conversed on any other topics than those relating to the study of antiquity, for his whole mental faculties were absorbed in his pursuits.

DISSENTERS, the general name for the various Protestant religious sects in this country that disagree in doctrine, discipline, or mode of worship with the established church. The Jews and Roman Catholics are not commonly called dissenters. In the early times of dissent the great classes of dissenters were the Presbyterians, the Independents, the Baptists, and the Quakers, and they still continue to be the most numerous sects, unless we are to include the Methodists, or followers of Wesley and Whitfield, some of whom are avowedly dissenters, and others not, and are also subdivided into Wesleyan Methodists, Primitive, &c. The minor sects of dissenters now make a long list; but many of them may be considered as only subdivisions of or included in the four leading denominations. The most numerous classes of dissenters in Scotland originated in a separation from the established church in 1740. They are called generally Seceders, and are divided into Burghers, Anti-Burghers, Original Burghers, and Original Seceders. There are also the body of dissenters called the Relief Church, who separated from the establishment in 1758; and the 'Free Church,' which separated from the established church in 1842. The only considerable body of Scottish dissenters of older standing, with the exception of the Episcopalians, are the Cameronians, or Reformed Presbyterian Synod, who are the representatives of the Covenanters of the 17th century. In Ireland, exclusive of the Roman Catholics, who greatly outnumber the adherents of the established church, the principal dissenters are the Presbyterians, who are most numerous in the province of Ulster.

DISSEPIMENTS, the partitions in the inside of a fruit which are formed by the union of the sides of its constituent carpels. Dissepiments are therefore necessarily alternate with the stigma.

DISTANCE. The only remark which we need make upon this common word is that it is very frequently applied to *angular* distance, meaning the angle of separation which the directions of two bodies include. Thus, the spectator's eye being at O, the angle AOB is the angular distance (frequently simply called the distance) of the two points A and B. In the apparent sphere of the heavens, distance always means angular distance. The term *apparent* distance is frequently applied in the same case.

DISTEMPER, an inferior kind of colouring, used as a cheap substitute for oil colours. It is composed of whitening mixed with size, to which the colour is added to form the necessary tint. Coarser colours are used for distemper than are employed in oil-painting. Scene-painting and paper-staining are executed in distemper.

DISTICHOUS, a term in Botany, signifies arranged in two rows, as the grains in an ear of barley, and the florets in a spikelet of quaking-grass.

DISTILLATION is a chemical process for applying a regulated heat to fluid substances in covered vessels, in order to separate their more volatile constituents in vapour: and for condensing them immediately by cold into the liquid state. The distillation of aromatic waters was known to the Greeks and Romans, and to the Arabians from very remote times. Arnoldus de Villa Nova and Raymond Lully both noticed, in the 13th century, a mode of producing intoxicating spirits by distillation. The alchemists of those days imagined that spirit derives its ardent qualities from the fire employed to heat the vessels.

The only substances employed in this country in the manufacture of ardent spirits upon the great scale (which is the chief example of distillation) are different kinds of corn, such as bar-

ley, rye, wheat, oats, buckwheat, and maize. Peas and beans also have been occasionally used in small quantity. The principles in these grains from which the spirits are indirectly produced are starch and a little sweet mucilage, which, by a peculiar process called *mashing*, are converted into a species of sugar. It is the sugar so formed which is the immediate generator of alcohol, by the process of fermentation. In mashing one or more kinds of corn, a greater or smaller proportion of malt is always mixed with the raw grain, and sometimes malt alone is used, as in the production of malt whiskey.

The manufacture of ardent spirits consists of three distinct operations: first, mashing; second, fermentation; third, distillation.

Mashing.—Either malt alone, or malt mixed with other grain, and coarsely ground, is put into the mash-tun, along with a proper proportion of hot water, and the mixture is subjected to agitation by a mechanical revolving apparatus. The water is applied at a temperature varying from 145° to 165° Fahr. After two or three hours' agitation, the whole is left to repose for an hour and a half, and then the worts (as the liquor is called) are drawn off to about one-third the volume of water employed, the rest being entangled in a pasty state among the farina. About two-thirds of the first quantity of water is now let into the tun, but at a temperature somewhat higher, and the mashing motion is renewed for nearly half an hour. A second period of infusion or repose ensues, after which these second worts are drawn off. Both infusions must be cooled as quickly as possible down to about 75° Fahr.: this is usually effected by exposing the wort for some time in large shallow cisterns, called coolers, freely exposed to aerial currents; but the liquor is sometimes cooled by being passed through serpentine tubes surrounded with cold water, or by the agency of ventilators blowing over its surface in extensive cisterns only three or four inches deep. A third mashing is conducted with a fresh portion of water, in order to extract the remaining saccharine matter from the grain.

The specific gravity of the first and second worts, when mixed, is about 1.060; and the liquor contains about 60 lbs. of saccharine extract per barrel of 36 gallons. The three mashings employ about 27 gallons of water to every bushel of ground meal.

Fermentation.—This consists in bringing the worts to a fermented state. The worts are drawn off into a fermenting vessel; and yeast or ferment is added, sufficient to decompose the sugar in the liquor. The process is commenced at a temperature between 60° and 70°, which soon afterwards rises to 85° or 90°. The first appearance of fermentation shows itself by a ring of froth round the edge of the vat usually within an hour after the addition of the yeast; and in the course of five hours the extrication of carbonic acid from the particles throughout the whole body of the liquor causes frothy bubbles to cover its entire surface. The yeasty froth begins to subside in about 36 hours, and, when the attenuation gets more advanced, the greater part of it falls to the bottom on account of its density relatively to the subjacent fluid. In from forty-eight to sixty hours the liquor begins to grow clear, and becomes comparatively tranquil. The liquor is stirred up occasionally during the fermentation, and the vessel is kept mostly closed after the first violence of the action. The specific gravity of the liquor diminishes as the process advances; the fermentation converts the sugar into alcohol or spirit; and, as the alcohol is lighter than water, it diminishes the specific gravity of the whole. The liquor itself is now called *wash*. 100 gallons of this wash contain about 12 gallons of proof spirit; if the whole of the sugar were decomposed (which it never is in practice), the produce of spirit would be greater. In the great distilleries, where the quantity of liquor operated on at once is very large, the duration of the fermenting process is longer than that above named.

Distillation. — Great distilleries are usually mounted with two stills, a larger and a smaller. The former is the *wash* still, and serves to distil from the fermented worts a weak crude spirit called *low-wines;* the latter is the *low-wine* still, and rectifies by a second process the product of the first distillation. In these successive distillations a quantity of fetid oil, derived from the corn, comes over along with the first and last portions received, and constitutes by its combination what is styled the strong and weak *faints*. These milky faints are carefully separated from the limpid spirit by turning them as they begin to flow from the still into distinct channels, which lead to separate *receivers*. From these receivers the various qualities of spirit, low wines, and faints are, for the purpose of redistillation, pumped up into charging backs, from which they are run in gauged quantities into the low-wine and spirit stills.

The distilling apparatus, in one of the large establishments near London, is thus arranged. The wash is conveyed through pipes from the fermenting vessel to the wash-charger, which is a closed iron cistern capable of containing 30,000 gallons. From this vessel the wash flows into the wash-still, a copper vessel holding 20,000 gallons: it is heated by a fire beneath, and is terminated at the top by a cover, which gradually decreases in diameter, and at length joins the *worm*, in another vessel. The wash is made to boil; and as alcohol boils and passes off in vapour at a temperature of 180° Fahr., while water requires a temperature of 212°, the heating is so managed as never to reach 212°; and the alcohol-vapour passes off with only a small portion of water-vapour: if the process were perfectly conducted, there would be no water pass off with the spirit; but in practice there always is, and to this extent the spirit is weakened by the mixture. The alcohol-vapour passes off into the worm, which is a copper tube curved spirally round the inside of a vessel thirty feet high, called the worm-tub: the tube is two feet in diameter at the upper part of the vessel, and diminishes down to two inches near the bottom. The worm-tub is filled with constantly flowing cold water, which keeps the copper worm at such a low temperature that the vapour in the worm is condensed into a

liquid. This liquid, forming the *low-wines*, flows out of the narrow end of the worm into the low-wines receiver, from which it again flows into the spirit-still. Another distillation occurs, and sometimes a third, until so much of the water is driven off as to leave the spirit of a proper strength. Standard or 'proof spirit' consists of one half absolute or pure alcohol and one half water: if a given bulk of distilled water weighs 13 ounces, an equal bulk of proof spirit will weigh exactly 12 ounces. This difference of specific gravity gives rise to the construction and use of the HYDROMETER. There are certain stages or degrees of strength, 'above' or 'below proof,' according to circumstances: thus, the strongest spirit produced by distillation is 70° above proof, spirit of wine is not less than 43° above proof, raw spirits sold by the distiller to the rectifier are at 25° and 11° above proof, gin is about 17° below proof. The rectifying, or giving a modified strength and a peculiar flavour to spirit, is effected in totally distinct establishments from those in which the spirit is produced from grain. Scotch and Irish *whiskey* are distilled spirit without artificial flavour. English *gin* is flavoured with juniper-berries, sugar, and other substances.

A large revenue is derived from distilled spirits; and the revenue officers exercise a most rigorous supervision over all the operations of a distillery.

For distillation in chemical processes, see ALEMBIC. For distillation from wine and from sugar, see BRANDY; RUM. For statistical details, see WINE AND SPIRIT TRADE.

DISTORTION. This term comprises all permanent deviations from the natural shape or position of the body, which are effected by the influence of external or internal force in parts originally soft and flexible, or such as have acquired unnatural pliancy by accident or disease.

1. Every part of the body capable of independent motion is furnished with two sets of muscles, acting in contrary directions, the purpose of which is obviously to bring the part back to its place after movement in either direction. But, if one set of the muscles should be suddenly cut across, the tension of their antagonists still remaining in action, the consequence would be a movement in obedience to the latter till the contraction had reached its limit; and the part in question would permanently retain the position into which it had thus been moved. The same effect would result if the muscle, instead of being divided, were paralysed by the interruption of its nervous communication with the brain. Again, if the tone of one muscle were increased by spasm or otherwise, so as to give it a decided preponderance over its antagonist, the result would be similar. These considerations will sufficiently explain the nature of one large class of distortions, namely, those which result from affections of the *brain*, *muscles*, and *nerves*.

The simplest of these is the *drawn mouth* or *hemiplegia*, which arises from the muscles of the cheek on one side being paralysed, and, the retractors of the opposite angle of the mouth being no longer balanced by an equal force, draw it up towards their origin, and retain it in that position.

Strabismus, or squinting, is frequently produced in the same way by a partial paralysis of that muscle the office of which is to turn the globe of the eye in the opposite direction, or it may arise from undue contraction of the muscle on the same side.

Wry-Neck is a distortion also due to irregular muscular action. It generally comes on gradually in infancy, and consists in a shortened and contracted state of the sterno-mastoid muscle of that side to which the head is inclined and from which the face is turned. *Club-Foot* is often nothing more than a similar contraction of the muscles of the calf, which draw up the heel, and eventually disturb the integrity of the ankle joint.

2. But by far the most common and important class of these affections is that which originates in disease of the bones.

The firmness and rigidity of the bones depends upon the due proportion of the earthy matter, phosphate of lime, that enters into their composition. If the proportion of this ingredient be too great, as in old age, and in the disease called *fragilitas ossium*, they become brittle, and are broken by the slightest causes; if it be too small, they become unnaturally pliant, and are distorted by the pressure of the superincumbent weight or the contraction of the muscles.

The latter condition is prevalent with other structural changes in the disorder called *Rickets*. This malady seldom appears within the ordinary period of lactation, or after puberty. It is most common among the poor, and in closely peopled districts, as all the diseases of children are; but it is by no means confined to either, or to children whose constitutions are apparently the most feeble in other respects. Indeed it is a frequent remark that the most robust and powerful men exhibit tokens of having been rickety in their childhood. Among such indications are smallness of the pelvis, with inward or outward curvature and disproportionate shortness of the lower limbs. This sudden check to the development of the skeleton, constantly observed in rickety children, with the distortion arising from the unnatural softness of the bones, is the most usual cause of the short stature of dwarfs.

Recovery, even from considerable degrees of this affection, is more frequent and rapid than might be imagined; but the pelvis and lower limbs, which, as above mentioned, are the most commonly and extensively implicated, seldom completely regain their natural proportions. This fact, as it regards the female pelvis, is worthy of notice, being the cause of by far the most dangerous kind of difficult parturition. It is in extreme cases of this sort that the Cæsarean section has been practised.

Independently of rickety distortion, there are two other kinds of curvature of the spinal column which demand a brief notice. The first, which has frequently been mistaken for rachitis, is usually called *lateral curvature*, to distinguish it from the more serious kind of distortion next to be considered, which is called *angular curvature*.

Unlike rickets, which almost always commence in infancy or early childhood, lateral curvature of

the spine seldom appears before the tenth year. The external deformity consists in the prominence of one hip (generally the right), and elevation of the corresponding shoulder, the blade of which sticks out in unsightly protuberance behind. The opposite hip and shoulder are respectively flattened and depressed; and the symmetry of the chest is destroyed, one side being larger than the other, and both twisted and misshapen. On examination the spine is found to have a double curvature sideways so as to resemble the letter S, but generally turned the other way, the concavity of the lower curve being on the right side, and the upper on the left side. It arises from weakness in the spinal muscles and local elongations of the ligaments of the vertebræ, from the habit of resting the weight in sitting or standing more on one side than the other, and that side is usually the right. The subjects of this kind of distortion are chiefly slender and delicate girls in the middle and upper classes, the poor being comparatively exempt. It is much promoted by means often used to prevent it, such as by confinement and restraint of the person and posture by stays, backboards, high-backed chairs, reclining on a board, and other contrivances to improve the figure, and restrain the development of the natural form, as well as by the sedentary habits and inappropriate exercises of the academy or school-room.

Angular curvature of the spine is a deformity very different in its nature and appearance from the last described. It arises for the most part from ulceration of a scrofulous kind in the vertebræ. The support in front being thus lost by the decay of the bones, the spine is sharply bent forwards so that one or more of the spinous processes project *behind*, indicating the position of the diseased vertebræ.

Rheumatism, and other disorders, and even common inflammations, occurring in a high degree within the joints or in their neighbourhood, occasionally produce like effects.

3. Distortions are sometimes occasioned by the contraction of other parts than those which are concerned in motion.

Such are those of the fingers and toes which arise from chronic inflammation and permanent contraction of the aponeurosis, or facia, a strong inelastic and fibrous membrane attached to the projecting points of bone, and stretched beneath the skin of the palm and sole for the protection of the nerves and other soft parts during the act of forcible grasping. The cicatrices left after a burn also produce various degrees of distortion.

A slight injury of the face below the eye, or the simple contraction from some other cause of the skin of that part, may produce the deformity called *ectropium*, or eversion of the lower lid; and the opposite state of inversion (*entropium*, or *trichiasis*) may result from a similar contraction of the edge of the eyelid itself.

4. Another class of distortions may arise from external pressure; as of the bones and cartilages of the chest, from tight stays; or of the phalanges of the toes, from ill-made shoes.

DISTRESS, 'districtio,' in the jurisprudence of the middle ages, denotes legal compulsion generally. The modern distress, in its most simple form, is the taking of a man's moveables in order to compel him to discharge some duty, or make amends for some wrong.

Some rights, to which the law annexes the remedy by distress, have not been left to the protection afforded by the mere detention of the *distress*, by which term the thing taken is also designated; in certain cases a sale of the property taken by way of distress is allowed, if, after a certain interval, the party distrained upon refuses or is unable to discharge the duty, or make amends for the wrong.

Distresses are made either for some duty omitted, or for some wrongful act done by the distrainee. Under the head of Distress for omissions, the most important among the feudal duties for which a distress may be taken is rent. Rent, in its original and still most usual form, is a payment agreed to be made by the tenant to his landlord for the occupation of land or a house. Such rent is denominated rent-service. To rent-service the law annexes the power of distress, without any agreement between the parties. By 4 Geo. II., c. 28, s. 5, the like remedy by distress is given in cases of rent-seck, as in the case of rent reserved upon lease. [RENT.]

There may also be distress for heriots and tolls.

There is also distress for damage done, which is called distress for damage-feasant. Cattle or dead chattels may be taken and detained in order to compel the payment of a reasonable sum of money for the injury sustained from such cattle or dead chattels being wrongfully upon property in the occupation of the party who takes them, and doing damage there. This is called a distress of things taken damage-feasant (*doing* damage).

The occupier of land may defend himself from damage by detaining the cattle which did the injury till compensation is made for the trespass. Not only the occupier of the land trespassed upon, but other persons entitled to share in the present use of the land, or of the produce, as commoners, &c., may distrain.

If cattle trespass through the default of the occupier of the land, as by his neglecting to repair his fences, or to shut his gates against a road or a close in which the cattle lawfully were, such negligent occupier cannot distrain unless the owner of the cattle suffer them to remain on the land after notice and time given to him to remove them; and if cattle trespass on one day and go off before they are distrained, and are taken trespassing on the same land on another day, they can be detained only for the damage done upon the second day.

Cattle, if once off the land upon which they have trespassed, cannot be taken. The occupier must get satisfaction for the damage by action.

Things necessary for the carrying on of trade, as tools and utensils, or for tillage, as implements of husbandry, beasts of the plough, and sheep as requisite to manure the land, are privileged from distress whilst other sufficient distress can be found. But this rule does not extend to a distress for a toll or duty arising in respect of the thing taken as a distress, or of things connected

with it; as a distress of two sheep for market-toll claimed in respect of the whole flock, or of the anchor of a ship for port-duty due in respect of such ship.

Things which a person has for the purpose of doing something to them in the way of his trade cannot be taken upon a distress on such person; as a horse standing in a smith's shop to be shod, or put up at an inn, or cloth sent to a tailor's shop to be made into clothes, or corn sent to a mill or market to be ground or sold. The goods of a guest at an inn are privileged from distress; but this exemption does not extend to the case of a chariot standing in the coach-house of a livery-stable-keeper. Goods in the hands of a factor for sale are privileged from distress; and also goods consigned for sale, landed at a wharf, and placed at a wharfinger's warehouse.

Beasts of the plough may be distrained if no other distress can be found. Beasts of the plough may also be distrained upon where the only other sufficient distress consists of growing crops, which, though subject to distress, are not, as they cannot be sold until ripe, immediately available to the landlord.

A thing cannot be distrained while it is in use, as an axe with which a man is cutting wood, or a horse on which a man is riding. Implements in trade, as frames for knitting, weaving, &c., are privileged from distress whilst they are in use; otherwise they may be distrained upon, if no other sufficient distress can be found.

Rent is not due until the last moment of the day on which it is made payable. No distress therefore can be taken for it until the following day. A distress for rent or other duties or services can be taken only between sunrise and sunset, but cattle or goods found damage-feasant may be distrained at any time.

No distress can be taken for more than six years' arrears of rent; nor can any rent be claimed where non-payment has been acquiesced in for twenty years (3 and 4 Wm. IV., c. 27).

Under 8 Anne, c. 14, and 11 Geo. II., c. 19, where a lessee fraudulently or clandestinely carries off his goods in order to prevent a distress, the landlord may within five days afterwards distrain them as if they had still continued on the demised premises, provided they have not been (*bonâ fide*) sold for a valuable consideration. And by the 7th section of the latter statute, where any goods fraudulently and clandestinely carried away by any tenant or lessee, or any person aiding therein, shall be put in any house or other place, locked up or otherwise secured, so as to prevent such goods from being distrained for rent, the landlord or his bailiff may, in the day-time, with the assistance of the constable or peace-officer (and in case of a dwelling-house, oath being also first made of a reasonable ground to suspect that such goods are therein), break open and enter into such house or place, and take such goods for the arrears of rent as he or they might have done if such goods had been put in an open field or place.

The landlord may enter a house to distrain, if the outer door be open, although there be other sufficient goods out of the house. It is not lawful to break open outer doors or gates; but, if the outer door be open, an inner door may be forced. If the landlord, having distrained, is forcibly expelled, he may break open outer doors or gates in order to retake the distress. If a window be open, a distress within reach may be taken out at it.

A distress may be made either by the party himself or his agent. The authority given to the bailiff, as he is called, is usually in writing, and is then called a warrant of distress; but a verbal authority, or the subsequent adoption of the act by the party on whose behalf the distress is made, is sufficient. In order that the distrainee may know what is included in the distress, an inventory of the goods should be delivered, accompanied in the case of a distress for rent by a notice stating the object of the distress, and informing the tenant that, unless the rent and charges be paid within five days, the goods and chattels will be sold according to law. This notice is required by 2 W. and M., sess. i., c. 5, s. 2. By 5 & 6 Will. IV., c. 59, s. 4, persons impounding cattle or animals in a common open or close pound, or in inclosed ground, are to supply them with food, &c., the value of which they may recover from the owner. By 11 Geo. II., c. 19, s. 10, goods distrained for any kind of rent may be impounded on any part of the tenant's ground, to remain there five days, at the expiration of which time they are to be sold, unless sooner replevied. After the lapse of a reasonable time, the landlord is a trespasser if he retain the goods on the premises without the express assent of the tenant, which assent is generally given in writing.

The 2 Will. & Mary, sess. 1, c. 5, sect. 3, directs that corn, grain, or hay distrained be not removed, to the damage of the owner, out of the place where the same shall be found or seized, but be kept there until replevied or sold; and 11 Geo. II., c. 19, which gives a distress for rent-service upon growing crops, directs, sects. 8 and 9, that they shall be cut, gathered, and laid up, when ripe, in the barn or other proper place on such premises, or, if none, then in some other barn, &c., to be procured for that purpose, and as near as may be to the premises, giving notice within one week of the place where such crops are deposited; and if the tenant, his executors, &c., at any time before the crops distrained are ripe and cut, pay or tender the rent, costs, and charges, the goods distrained are to be restored. In all other cases, if the rent or other duty be paid or performed, or tendered to be paid or performed, before the distress is impounded, a subsequent detainer is unlawful, and a subsequent impounding or driving to the pound is a trespass.

The statutes which authorise the sale of distresses extend only to those made for rent.

A distress made by a party who has no right to distrain, or made for rent or other service which the party offers to pay or perform, or made in the public highway, or upon goods privileged from distress either absolutely or temporarily, is called a *wrongful distress*. Where no right to distrain exists, or where the rent or duty is tendered at the time of the distress, the owner of the

goods may rescue them or take them forcibly out of the possession of the distrainer, or bring either an action of replevin, or of trespass. In replevin, the cattle or goods taken are to be redelivered to the owner upon his giving security by a replevin bond, for returning them to the distrainer, in case a return shall be awarded by the court; and therefore in this action damages are recovered only for the intermediate detention and the costs of the replevin bond. In the action of trespass the plaintiff recovers damages to the full value of the goods; because, upon such recovery, the property in the goods is transferred to the defendant.

The 2 W. & M. sess. i. c. 5, sect. 5, provides "that in case of any distress and sale for rent pretended to be due, where in truth no rent is due, the owner of the goods so distrained and sold may, by action of trespass or upon the case, recover double the value of such goods, with full costs of suit."

A distress for more rent, or greater services than are due, or where the value of the property taken is visibly disproportionate to the rent or other appreciable service, is called an *excessive distress*, for which the party aggrieved is entitled to recover compensation in an action on the case; but he cannot rescue, nor can he replevy or bring an action for trespass.

DISTRIBUTION OF ELECTRICITY. [ELECTRICITY.]

DITHMARSH. [HOLSTEIN.]

DITHYRAMBUS, the name of a hymn in honour of Bacchus, sung by a chorus of fifty men or boys as they danced round the blazing altar of the god: from this peculiarity it was also called the *cyclic* or *circling* chorus. The original subject of the song was the birth of Bacchus.

DITHYROCA'RIS, a fossil genus of Crustaceans, so named by Dr. Scouler. It occurs in Tyrone and Derry.

DITRU'PA, a genus of Annelids allied to *Serpula*, but living in a free tubular shell open at both ends, resembling that of *Dentalium* (Mollusca), and it is to Mr. Berkeley ('Zool. Journal,' vol. v.) that the now recognised distinction between *Ditrupa* and *Dentalium* is due. [ANNELIDA.]

In *Ditrupa* the operculum is fixed to a conical pedicellated cartilaginous body, thin, testaceous, and concentrically striate. The branchiæ are twenty-two, in two sets, not rolled up spirally, flat, broadest at the base, and feathered with a single row of cilia. The mantle is round behind, slightly crisped, denticulated in front, strongly puckered on each side. There are six fascicles of bristles on each side. Example, *Ditrupa subulata*, Berkeley (*Dentalium subulatum*, Deshayes). This species lives in sand, mud, &c., at great depths (from 60 to 120 fathoms) in the British seas, and along the shores of Madeira; but probably its range is still more extensive. It is suspected by Mr. Berkeley that other so-called *Dentalia* will be found to belong to the genus *Ditrupa*.

DITTANY OF CRETE, the common name of the woolly labiate plant called *Origanum dictamnus* or *Amaracus dictamnus*.

DITTON, HUMPHREY, an eminent divine and mathematician, was born at Salisbury, May 29, 1675. Contrary, it is understood, to his own inclination, but in conformity to his father's wishes, he chose the profession of theology; and he filled a dissenting pulpit for several years at Tunbridge with great credit and usefulness.

His mathematical attainments having gained for him the friendship of Mr. Whiston and Dr. Harris, they made him known to Sir Isaac Newton, by whom he was greatly esteemed, and by whose recommendation and influence he was elected mathematical master of Christ's Hospital. This office he held during the rest of his life, which however was but short, as he died in 1715, in the 40th year of his age.

Ditton was highly esteemed amongst his friends; and great expectations were entertained that he would have proved one of the most eminent men of his time. He however attained a high degree of celebrity, and published several works and papers of considerable value, of which the best known are those on the Longitude, on Fluxions, and on Perspective.

DIURETICS are agents which augment the urinary secretion and facilitate its expulsion from the bladder.

In attempting to ascertain or account for their mode of action, we must constantly bear in mind the nature of the functions of the kidneys, viz., not only to remove from the body a considerable quantity of its fluid contents, but at the same time a great number of saline and other principles, the retention of which, for any considerable time, in the system, causes serious departure from its healthy state, and in some instances speedy death. Not only therefore must the quantity of fluid eliminated be in due proportion, but the quality or chemical constitution of it must also be of a proper kind. The means which we employ to attain our object may be classified according to their primary modes of action on the system. Some are stimulant, such as gamboge, cytisus scoparius, alcohol, spiritus ætheris nitrici, oil of juniper, oil of turpentine, &c. Some, again, are sedative, such as lactuca virosa, leontodon taraxacum, digitalis, squill, colchicum, &c. Others are refrigerant, of which some render the urine acid, such as the dilute mineral acids; some, on the opposite hand, render the urine alkaline, such as the carbonate of potass, acetate, tartrate, and bitartrate of potass; while certain saline diuretics do not render it either acid or alkaline, such as nitrate of potass, bichlorate of soda, &c.

When a very great quantity of fluid is present in the body, some of it must be carried off by other means before diuretics can act, as the absorbents under such circumstances do not furnish a supply to the kidneys—the activity of absorption being always in an inverse ratio to the smallness of the quantity of fluid present. If there be great general debility of the system, and particularly of the absorbents, this state must be obviated either by the exhibition of tonics previous to or along with the diuretic remedies.

DIVAN. [DIWAN.]

DIVERGENCY, DIVERGENT. [CONVERGENT.]

DIVERS, *Colymbidæ*, a family of swimming birds (*Natatores*), having a smooth, straight, compressed, and pointed bill. The *Colymbidæ* are expressly formed for aquatic habits. On the land they are awkward and embarrassed, shuffling along with their breast on the ground; but in the water they display amazing address and quickness; and they trust to their powers of diving for safety. It is not often that they can be forced to take wing, and they rise with difficulty; when however they have attained a due elevation in the air, they sweep along very rapidly, and are thus enabled to migrate or change their abode from the sea to inland lakes, or *vice versâ*. The wings are small, concave, and composed of stiff feathers; they are used as oars for giving additional impulse to the body when under water, while the bird is escaping pursuit or giving chase to fishes. The limbs are placed as far back as possible; the tarsus is flattened laterally so as to cut the water, and the toes, either lobated or webbed, are so arranged as to fold up into a small compass when drawn towards the body in order to give the stroke. The plumage is deep, close, silky, and extremely glossy. The tail is short or wanting. The body is flat and oval, and from its depressed contour appears to float more deeply on the surface of the water than it does in reality.

The family *Colymbidæ*, as established by Dr. Leach, comprises two genera, viz. the Grebes (*Podiceps*, Lath.) and the Divers (*Colymbus*, Lath.). The Linnæan genus *Colymbus* includes both the Grebes and Divers.

Genus *Podiceps*.—'In former systems,' says Mr. Selby, 'when the natural affinities which connect the various orders and families together were neglected, or at least but imperfectly investigated, the Grebes, from a fancied resemblance (for such it may properly be termed) in the form of their feet, were arranged with the *Coots* and *Phalaropes* (birds also belonging to different families), and formed a truly artificial division under the title of *Pinnatipedes*.' We may here observe, that though the family relationship of the Grebes to the Divers is generally acknowledged, some ornithologists widely separate them. Thus in the 'Fauna Boreali-Americana,' *Podiceps* is placed at the head of the order *Natatores*, and is immediately succeeded by *Sterna* (the Terns): the position of *Colymbus* is between *Pelecanus* and *Uria* (the Guillemots), which last genus concludes the order.

In the genus *Podiceps* the head is narrow; the beak long, pointed, and sharp, somewhat compressed at the sides, and slightly inclined upwards towards the tip. The neck is long; the tail is wanting. The toes, instead of being webbed, are separate and flattened, having their edges fimbriated with a broad stiff membrane, each toe being in fact a beautifully formed paddle. Of the three anterior toes the outermost is the longest and broadest; the next is nearly as large, and its outer edge lies tile-like over the inner edge of the outermost; the innermost toe is less than the middle one, on which its outer edge impinges. The hind toe is short, placed high on the tarsus, and furnished with a lobated membrane. The arrangement of the scales covering the toes gives them a leaf-like appearance, for the lines dividing the scales run obliquely in regular succession from a central shaft, formed by the bones advancing to the tips, which are covered each with a broad flat nail. The tarsus is short, and much compressed laterally.

Head of male Eared Grebe, in Summer Plumage, and Foot of the same.

The Grebes haunt the sea as well as lakes and rivers, and swim and dive with great address. So instantaneously do they plunge, that, unless when taken by surprise, the gunner has some difficulty in hitting them. They will make a stretch of two hundred yards before coming up to breathe, which is done by merely raising the head for a second above the water. Fishes, frogs, and aquatic insects constitute their food. The stomach, upon dissection, is always found to contain a mass, greater or less, of feathers, swallowed by the bird while dressing its plumage. Some are inclined to think that they are purposely swallowed in order to assist digestion.

From the changes in plumage to which the Grebes are subject, and the difference between the young and adults, the older writers fell into many errors respecting the species; indeed, it is only within the last few years that these mistakes have been rectified. Some species, during the breeding season, are adorned with elegant silky plumes about the head or throat, and it is from the position of these that the Horned Grebe, the Eared Grebe, and the Crested Grebe, take their respective names.

The Grebes build their nests among reeds and dense aquatic herbage; the nest is composed of a mass of half-decayed roots, dried flags, &c., and floats on the water, so as to rise or fall with the tide, or swell and subsidence. The eggs are three or four in number, and are carefully covered up by the female every time she leaves the nest.

The genus *Podiceps* is numerous in species and widely distributed. Five species are British; and of these four are common alike to Europe and North America. (Selby's 'Ornithology;' Yarrell's

'British Birds;' Gould's 'Birds of Europe;' Bonaparte's 'Birds of Europe and North America;' Gould's 'Birds of Australia,' &c.)

Genus *Colymbus* (*Mergus*, Brisson; *Urinator*, Lacépède; *Eunytes*, Illiger).

In the genus *Colymbus*, the bill is long, straight, and sharp-pointed; the feet are large; the three anterior toes are webbed, the hind toe is small and lobed; the tail is short, and concealed by the upper coverts.

In their aquatic habits and mode of life, the Divers resemble the Grebes, being the constant inhabitants of the water. They seldom fly, unless for the purpose of migration. In swimming, their broad flattened body is immersed in the water, the head and neck only appearing above the surface. They dive without exertion, and can stretch to a great distance before rising to breathe. The species of this genus are limited in number, and confined to the northern latitudes. They are migratory, passing in spring to the polar regions, where they breed among the fresh-water lakes of the interior, whence, on the approach of winter, they visit the coasts of more southern countries and those of our islands, feeding on herrings, sprats, and other fish. They lay but two eggs. The young differ greatly from the adults in plumage, and do not acquire maturity until after the third general moult. The Divers are wild and cautious, and trust exclusively to their aquatic powers for safety. Their voice is a loud wailing cry or scream. The following species are recognised:—

1, *Colymbus glacialis*, the Northern Diver, the Ember Goose, the Loon, the Greatest Speckled Diver, &c. This species is common to Europe, Asia, and North America. In its stages of immaturity, it is a common winter visitant to the bays and friths of Scotland, and the northern coast of England, but adult birds are far more rare. It is recorded by Mr. Graves, that in the severe winter of 1813-14, two fine individuals were taken alive in the Thames below Woolwich, and kept in confinement for some months, being allowed the range of an extensive piece of water, whence they ultimately escaped in the month of April. The Northern Diver is very beautiful; its upper plumage, when adult, being glossy black with numerous quadrangular white spots. Length, 36 inches.

2, *Colymbus Arcticus*, the Black-Throated Diver, which is common to Europe, Asia, and North America. The young, as well as adults, visit the Scottish friths and lakes, but are by no means abundant, though it is said that individuals occasionally remain during the summer, and probably breed on some of the lakes of the northern and western Highlands. This species is common in Hudson's Bay, but, according to Dr. Richardson, is rarely seen upon the lakes in the interior.

3, *Colymbus Balthicus*, confined to Northern Europe. (Gould's 'Birds of Europe.' Suppl. Pl.)

4, *Colymbus Septentrionalis*, the Red-Throated Diver, the Sprat-Loon, &c. This species is common to the arctic regions of Europe, Asia, and America; it is abundant on the coast of Hudson's Bay, and upon the lakes of the interior; its haunts reaching even to the extremity of Melville Peninsula. The winter migrations of this species extend to the southern coast of England; it enters bays and the mouths of rivers, and is noted by the Thames fishermen for its partiality to sprats. A few breed annually on the northern Scottish lakes, and also on a lake among the hills in the isle of Hoy, one of the Orkneys.

To these brief observations we may add that the *Colymbus Imber*, Linn., Shaw, and others, is the young of the Northern Diver. The Lesser Imber, of Bewick, is the young of the Black-Throated Diver; and the Speckled Diver of Montagu (Suppl. to 'Ornith. Dictionary') is the young of the Red-Throated Diver.

(Selby's *Ornithology;* Gould's *Birds of Europe;* Yarrell's *British Birds;* the *Fauna Boreali-Americana.*)

DIVIDEND, in commerce, is a word which has two distinct meanings. In its more general employment it is understood to express the money which is divided, *pro rata*, among the creditors of a bankrupt trader, out of the amount realised from his assets. [BANKRUPT.]

Its other meaning is not so appropriate as that which has just been explained. It is used to signify the half-yearly payments of the perpetual and terminable annuities which constitute the public debt of this country. The payment of those so-called dividends is managed on the part of the government by the Bank of England, which receives a compensation from the public for the trouble and expense attending the employment.

DIVIDEND, in Arithmetic, any quantity which is to be divided (*dividendum*). Thus in the sentence '100 divided by 20 *gives* 5,' the dividend is 100.

DIVIDERS. [COMPASSES.]

DIVING BELL. [SUBMARINE DESCENT.]

DIVINING ROD, a forked branch, usually of hazel, by which it has been pretended that minerals and water may be discovered in the earth; the rod, if slowly carried along in suspension, dipping and pointing downward, it is affirmed, when brought over the spot where the concealed mine or spring is situated. The form, the material, and the mode of using the divining rod of the modern miners and water-finders, seem to be superstitions of comparatively recent introduction. Many persons with some pretensions to science have been believers in the powers ascribed to the divining rod.

DIVINITY. [THEOLOGY.]

DIVISION, the process of ascertaining how many times and parts of times one number is contained in another.

DIVISION OF EMPLOYMENTS, in political economy, is an important agent in increasing the productiveness of labour. The means by which it adds to the efficacy of labour are described by Adam Smith to be—1st, an 'increase of dexterity in every particular workman;' 2ndly, 'the saving of the time which is commonly lost in passing from one species of work to another;' and, 3rdly, 'the invention of a great number of machines which facilitate and abridge labour, and enable one man to do the work of many:' to which may

be added, 4thly, the separation which it causes between labour and the direction of labour; 5thly, the power which it gives of using machinery effectually, when invented; 6thly, the opportunities of exchange which it affords, and the means of availing ourselves of the enjoyments arising from the natural capabilities of the soil, climate, situation, or mineral productions of different parts of the world, and of the peculiar aptitude of their inhabitants for various kinds of industry.

The power of distributing men into particular employments must be limited by the extent of the market in which the produce of their labour may be exchanged. When there are no means of exchanging, men must provide everything for themselves that they require; and there is no further division of employments than that which necessarily takes place in families, and in the most simple forms of industry. So, in every degree in which the situation and circumstances of men give facilities of exchange, do particular employments become assigned to individuals.

But while, by means of exchange, employments are thus subdivided, the labour of many men is most efficiently combined in producing particular results. The combinations of industry for one object are often truly wonderful, while the employment of those who are really co-operating with one another are so distinct, that they are wholly unconscious of any combination at all; nor is their combination at once perceptible to others.

The effects of a combination of labour and division of employments upon the distribution of wealth is that, by multiplying the modes in which industry is made productive, it is the main cause of the various grades of society which exist in all civilised countries. The different employments of men determine their social position as labourers or employers of labour; and the wealth arising from the effect of the employment of labour is distributed through the several classes, as rent, profits, and wages.

(Adam Smith's *Wealth of Nations*, book i. chapters 1, 2, 3, with Notes by M'Culloch and Wakefield; M'Culloch's *Principles of Political Economy*, &c.)

DIVORCE (from the Latin word *divórtium, a divertendo*, from diverting or separating) is the legal separation of husband and wife. In England, divorce is of two kinds: à mensâ et thoro, from bed and board; and à vinculo matrimonii, from the bond of marriage. The divorce à mensâ et thoro is pronounced by the spiritual court for causes arising subsequent to the marriage, as for adultery, cruelty, &c.: it does not dissolve the marriage, and is only a separation.

The divorce à vinculo matrimonii can be obtained in the spiritual courts for causes only existing before the marriage, as precontract, consanguinity, impotency, &c. This divorce declares the marriage to be null; the issue begotten between the parties are bastardised; and the parties are at liberty to contract marriage with others.

Marriage is now, by the law of England, indissoluble by the decree of any court, on account of any cause that arises subsequently to the marriage; but divorce à vinculo matrimonii may still, for adultery, be obtained by act of parliament. For this purpose it is necessary that a civil action should have been brought by the husband in one of the courts of law against the adulterer, and damages obtained therein, or some sufficient reason adduced why such action was not brought, or damages obtained, and that a definite sentence of divorce à mensâ et thoro should have been pronounced between the parties in the ecclesiastical court. But this sentence cannot be obtained for the adultery of the wife, if she recriminates, and can prove that the husband has been unfaithful to the marriage vow; and further, to prevent any collusion between the parties, both houses of parliament may, if necessary, and generally do, require satisfactory evidence that it is proper to allow the bill of divorce to pass.

The expenses of a divorce by act of parliament are so considerable as to amount to an absolute denial of relief to the mass of society. There is an order of the House of Lords that, in every divorce-bill on account of adultery, a clause shall be inserted to prohibit the marriage of the offending parties with each other; but this clause is generally omitted. But it is not unusual for parliament to provide that the wife shall not be left entirely destitute, by directing a payment of a sum of money, in the nature of alimony, by the husband, out of the fortune which he had with the wife. By the divorce à vinculo matrimonii the wife forfeits her dower. [DOWER.]

A Parliamentary Return (354, sess. 1844) gives the number of matrimonial suits instituted in each metropolitan and diocesan court in England, Wales, and Ireland, for the four years 1840, 1, 2, 3; the number in the Court of Session, Scotland; the number of appeals before the Judicial Committee of Privy Council, or the House of Lords; and the number of divorce acts passed in the same four years. The following is an abstract of this return:—

	Suits.
England	160
Wales	2
Ireland	57
Scotland	169
	Appeals.
Judicial Committee	6
House of Lords	4
	Divorce Acts.
1840	8
1841	5
1842	9
1843	5

In the Court of Arches the average expense of 32 suits was 168*l.*; in the Consistorial and Episcopal Court of London the average expense of 87 suits was 120*l.* In appeals before the Judicial Committee the average expense of 6 suits was 586*l.*; in appeals before the Lords (4 cases, all from the Court of Session, Scotland) the expenses varied from 23*l.* to 53*l.* The average expense (fees, House of Lords) of each act (27 acts) was 87*l.* 16*s.* 10*d.*

The law of Scotland relating to divorce differs widely from that in England: there, a divorce à vinculo matrimonii is a civil remedy, and may

be obtained by the judgment of the competent court, for adultery, or for wilful desertion by either party, persisted in for four years, though to this a good ground of separation is a defence. But recrimination is no bar to a divorce, as it is in England.

DIWAN is a Persian word familiar to readers of works relating to the East, in the sense of—1st, a senate, or council of state; and, 2nd, a collection of poems by one and the same author.

DIXMUIDEN. [FLANDERS, WEST.]

DIZIER, ST. [HAUTE-MARNE.]

DMITRIEV, IVAN IVANOVITCH, was born in 1760, in the government of Simbirsk. After being educated at Kazan until his twelfth year, and serving for some time in the Russian army, he entered the civil service, and after the accession of Alexander he was made successively minister of justice and privy councillor, and finally retired from public life with a pension and the order of St. Vladimir of the first class. After Karamzin, Dmitriev was, among contemporary writers, the one who most contributed to polish the Russian language, imparting to it ease and gracefulness of style and elegance of diction. His poems, which are deservedly popular, consist principally of odes, epistles, satires, tales, and fables, in which last-mentioned species of composition—a very favourite one with his countrymen—he particularly excelled. In his poetical tales he stands almost alone among his countrymen, not less for the playfulness and shrewdness of his satire than for the peculiar happiness and finish of his style.

DNIEPER, the ancient *Borýsthenes*. From the swampy forest highlands on the confines of the Russian governments of Tver and Smolensk rise three great rivers, the Volga, the Dwina, and the Dnieper, which form the arteries of the internal navigation of Russia, carrying their waters respectively to the Caspian Sea, the Baltic Sea, and the Black Sea, and flowing throughout their whole course within the limits of the Russian empire. Of these the Dnieper, rising in the circle of Viasma, in the northern part of Smolensk, flows S. to the town of Smolensk, whence it turns W. as far as Orcha, in the government of Moghilev; here it turns S., and running for several miles through that government, it then reaches the boundary and divides Moghilev from Minsk. In this part of its course it is increased by many tributary streams, the chief of which are the Droutz, the Soj, and the Bereznia, which last is united to the Dwina by means of a canal. After forming the boundary between the governments of Minsk and Tshernigoff, it enters that of Kiev, where it receives the Pripet (which the King's and Oginski canals connect with the Bug, the Vistula, and the Niemen), the Desna, the Tetcrev, and the Irpen. Soon after its junction with the Desna, it forms the western limit of the government of Poltava, and turning to the south-east, it enters that of Ekaterinoslav, having received in this part of its course the Pajol, Vorskin, Orel, Soula, and other streams. Having passed the town of Ekaterinoslav, it runs S. for about 60 miles, and in this part of its course forms 13 rapids which greatly impede the navigation of the river; below the rapids it flows S.W. between the governments of Kherson and Taurida, and enters the Black Sea by a wide embouchure, through which also the Bog, the ancient *Hýpanis*, (which rises in Galizia, and drains the provinces of Podolia and Kherson), pours itself into the same sea. The embouchure is in fact rather a lake or gulf; it extends from Cherson to Oczakoff, about 50 miles, with a breadth of from 1 mile to 6. It is for the most part shallow, and its shores are very unhealthy in summer, during which season salt is gathered from the dried-up swamps.

The entire length of the Dnieper, with its windings, is about 1000 miles; its average width is estimated at 700 paces. Its basin comprises 14 of the finest provinces of Russia, with all of which it has communication by its navigable branches and by canals. The Dnieper flows for the most part between high banks, the greatest elevation of which is along the eastern side. The upper part of its course is through a marshy forest country, and in the middle and lower course it passes over many rocks. The river is navigable almost from its source to its mouth; even the obstructions presented by the cataracts have been removed by the magnificent hydraulic works of the Russian government; several of the ledges of rocks having been entirely removed, and channels formed which are protected from winds by lofty dikes of granite. Produce is generally conveyed *down* the river to the cities on the Black Sea, but fleets of large barks also pass annually by the canals mentioned (and those that connect the Dwina with the Neva) to Riga and St. Petersburg. The freights consist chiefly of timber, corn, iron, linen, hemp, salt, &c. Below the cataracts upwards of 70 islands occur, which produce a grape resembling the currant; they are full of serpents and wild cats.

As the Dnieper flows through more than nine degrees of latitude, there is great diversity of climate in various parts of its basin: at Smolensk the waters freeze in November, and continue icebound until April; at Kiev they are frozen from January to March only. The river abounds in sturgeon, carp, pike, and shad. There are bridges across it at Smolensk and Kiev, the latter, which is 1638 yards in length, and constructed with rafts, is removed about the end of October and replaced in the spring, as it would otherwise be destroyed on the breaking up of the ice.

The country between the Dnieper and the Bog was formerly inhabited by the Zaparog Cossacks. The designation *Za-parog* means 'beyond the cataracts,' and was applied to them from their position to the west of the cataracts of the Dnieper. These hordes were dispersed in 1768, but the name Zaparog is still applied to the inhabitants of this region.

DNIESTER, the ancient *Tyras*, a river of European Russia, rises in a small lake on the north-eastern slope of the Carpathian mountains, in Austrian Galizia. In Galizia it flows S.E. past Sambor and Halicz, and receives the Stry, Swica, Lomnica, and Bistritza, on its right, and the

Zloca-Lipa, Stripa, and Sered, on its left bank. On reaching the northern boundary of Russian Bessarabia, where it receives the Podhorze or Zbroutsch, it runs eastwards to Uchitza, but soon afterwards flows again towards the south-east, separating Bessarabia from Podolia and Cherson, and enters a marshy lake about 19 miles long, 5 miles broad, but not more than 7 feet deep, which lies between Akerman and Ovidiopol, and communicates with the Black Sea by the Otchakov and Tsaregrad passes, which are separated by a long series of low sandy islands.

The current of the Dniester is exceedingly rapid. The navigation commences at Halicz, but is interrupted below Yampol by two considerable falls and several whirlpools; and it does not become free again until it reaches Bender. As far as Old Sambor it flows through a deep broad valley, which afterwards expands on its eastern bank into an extensive plain; while on its right bank it is occasionally skirted by offsets from the Carpathian chain. Below Khotim it flows through an open flat country. Its whole course is about 600 miles long, and the average breadth is said to be 170 yards.

Timber, grain, and other products are conveyed down the Dniester to Odessa. The river abounds in sturgeon.

DOAB, a word signifying *two waters*, which is used in Hindustan to denote any tract of land included between two rivers. There are several Doabs in Hindustan, but the district to which the name is most generally applied is situated between the Ganges and the Jumna. This district has its eastern extremity at Allahabad, whence it proceeds in a north-west direction to the hilly country in northern Hindustan, the northern frontier of the district of Saharunpoor in the province of Delhi forming its north-western boundary. The length of this tract is more than 500 miles, and its mean breadth about 55 miles. The prevailing character of the Doab is flatness and nakedness. The principal productions are millet and barley, sugar, cotton, tobacco, and indigo. The southern part of the Doab came into the possession of the English in 1801, when it was acquired from the king of Oude. In 1803 the more northern part was ceded to the English by Dowlut Rao Scindia.

DOBERAN. [Mecklenburg-Schwerin.]

DOBOKA. [Transylvania.]

DOBREE, PETER PAUL, was born in the island of Guernsey in the year 1782. At an early age he was sent to Dr. Valpy's school at Reading, and stayed there till he went to Cambridge, and became an undergraduate of Trinity College, in 1800. He took his B.A. degree in 1804. After being elected a fellow of his college, he continued to reside at Cambridge, devoting himself to classical studies, and enjoying the intimacy of Porson, from whom he derived all the spirit of his scholarship. After Porson's death, the books and MSS. of that great critic were purchased by Trinity College, and the task of editing part of Porson's notes was intrusted to Dobree: he was prevented however by illness, a subsequent journey to Spain, and other causes, from publishing the portion of these remains assigned to him till 1820, when he brought out an edition of the Plutus and of all that Porson had left upon Aristophanes, along with some learned notes of his own. In 1822 he published Porson's transcript of the lexicon of Photius. In the following year he was elected Regius Professor of Greek. He died on the 24th September, 1825. He was engaged on an edition of Demosthenes at the time of his death: his notes on this and other Greek and Latin authors were collected and published by his successor in 1831. Some of his remarks are very acute, and some of his conjectures ingenious. As a scholar, Dobree was accurate and fastidious, he had taste, and good common sense, which preserved him from committing blunders. His unwearying industry supplied him with a vast induction of particular observations; but he was unwilling, perhaps he had not the power, to generalise.

DOBSON, WILLIAM, was born in London in 1610, and was apprenticed to Mr. Peake, afterwards Sir Robert Peake, painter and picture-dealer, who kept a shop at Holborn Bridge. Sir Robert Peake set Dobson to copy pictures for him, and exposed the copies for sale in his shop-window. One of these copies was seen by Vandyck in a shop-window on Snow Hill, and having made inquiries for the artist, he found him at work in a poor garret, whence he took him, and introduced him to the king. After the death of Vandyck, Charles I. appointed Dobson serjeant-painter and groom of the privy-chamber. The rebellion, however, together with his own extravagance, got Dobson into difficulties, and he was thrown into prison for debt, from which he was released by a Mr. Vaughan, whose portrait he painted, and he considered it his best work in that class. He did not long enjoy his liberty: he died in London in 1646, aged only thirty-six, and was buried at St. Martin's-in-the-Fields.

Dobson painted portrait and history equally well, and his portraits are generally considered so excellent, that he has been termed the English Vandyck, to whom he was but little inferior in this branch of art, and his reputation was unrivalled by that of any English painter until the appearance of Sir Joshua Reynolds.

DOCK, the common name of many perennial tap rooted species of the genus *Rumex*.

DOCK, a place artificially formed for the reception of ships, the entrance of which is generally closed by gates. There are two kinds of docks, dry-docks and wet-docks. The former are used for receiving ships in order to their being inspected and repaired. For this purpose the dock is so contrived that the water may be admitted or excluded at pleasure, so that a vessel can be floated in when the tide is high, and the water run out with the fall of the tide, or be pumped out, the closing of the gates preventing its return. Wet-docks are formed for the purpose of keeping vessels always afloat. Dock-yards belonging to the government usually consist of dry-docks for repairing ships, and of *slips* on which new vessels are built; besides which they comprise various workshops and storehouses.

The first wet-dock for commercial purposes made in this kingdom was formed in the year 1708 at Liverpool. Since that time others have been added at different periods; and at present the margin of the Mersey along the whole extent of the town, for about three miles, is occupied by docks. They comprise the *Northern*, the *Clarence*, the *Victoria*, the *Waterloo*, the *Prince's*, the *George's*, the *Canning*, the *Manchester*, the *Salthouse*, the *Duke's*, the *King's*, the *Queen's*, the *Albert*, the *Union*, the *Brunswick*, the *Herculaneum*, and the *Harrington* docks. Some of these are not yet (1848) opened for trade; but those already opened cover more than 100 acres, and they have an extent of quay ten or twelve miles in length.

At Birkenhead, opposite Liverpool, fine and extensive docks are in process of formation, comprising a floating dock of 150 acres, and about half a dozen smaller docks: some of these are opened for trade.

At Fleetwood, in Lancashire, docks suitable for steam packets have been opened.

The first commercial wet-dock constructed in the port of London was for the accommodation of vessels employed in the Greenland whale-fishery. This dock, which is now known as the *Commercial Dock*, is situated at Rotherhithe; it occupies altogether 49 acres, about four-fifths of which are water: it is now used mainly for the timber and corn trade. Adjoining it is the *East Country Dock*, used for the timber trade.

Up to the end of the last century, nearly all ships arriving in London discharged their cargoes into lighters in the river. To remedy this inconvenience, a plan was sanctioned in 1799 for constructing wet-docks for the reception of ships employed in the West India trade. The *West India Docks* extend across the Isle of Dogs. The import dock is 870 yards long and 166 yards wide; the export dock is of the same length and 135 yards wide; there are besides two basins, one at each entrance, that at Blackwall being 5 acres, and that at Limehouse 2 acres in extent. A canal, cut across the Isle of Dogs, has been also appropriated as a dock or basin. The *London Docks*, situated in Wapping, and finished in 1805, consist of the western dock of 20 acres, the eastern dock of 7 acres, and the tobacco dock, between the other two, of more than one acre. The space included within the dock walls exceeds 71 acres. The warehouses, especially those for tobacco and wine, are of vast extent. The *East India Docks*, intended for the reception of ships employed by the East India Company, are situated at Blackwall, below the entrance to the West India Docks. There are two docks, one for unloading ships, the other for loading, of the area of 18 and 9 acres respectively; the entrance basin, which is common to both docks, is about 3 acres in extent. The *St. Katherine's Docks*, situated between the London Docks and the Tower, were opened in 1828; the outer wall incloses an area of 24 acres, of which 11 acres are water, the remainder being occupied by quays and warehouses. There are two docks, each capable of receiving vessels of 800 tons burden. The dock accommodations at Bristol, Glasgow, Hull, Leith, and Sunderland are on a large scale. Docks have been recently formed also at Goole and Grimsby. There are government docks at Portsmouth, Plymouth, and Pembroke.

DOCKET. [BANKRUPT.]

DOCTOR, one that has taken the highest degree in the faculties of Divinity, Law, Physic, or Music. In its original import it means a person so skilled in his particular art or science as to be qualified to teach it.

DOCTORS' COMMONS, the College of Civilians in London, near St. Paul's Churchyard, founded by Dr. Harvey, Dean of the Arches, for the professors of the civil law. The official residences of the judges of the Arches' Court of Canterbury, of the judge of the Admiralty, and the judge of the Prerogative Court of Canterbury, are situated there. It is also the residence of the doctors of the civil law practising in London, who live there (for diet and lodging) in a collegiate manner, and common together, and hence the place is known by the name of Doctors' Commons. It was burnt down in the fire of London, and rebuilt at the charge of the profession. (Chamberlayne, *Mag. Brit. Notitia.*) To the college belong a certain number of advocates and proctors. [BARRISTER; PROCTOR.]

DODD, REV. WILLIAM, LL.D., was born in 1729, at Bourne, in Lincolnshire, of which place his father was vicar. In 1745 he was admitted a sizar of Clare Hall, Cambridge, and took his bachelor's degree with reputation in 1750. In 1753 he received priest's orders from the Bishop of London; and from this time he continued to obtain a succession of preferments in the church, possessing in the latter part of his life an ecclesiastical income of eight hundred a year. In 1763 he was entrusted with the education of Philip Stanhope, afterwards the famous Earl of Chesterfield. In February, 1777, he was arrested on a charge of having forged the signature of his late pupil, Lord Chesterfield, to a bond for four thousand pounds, of which he had obtained payment. He repaid the money, but was brought to trial and convicted. He was executed on the 27th of July, 1777. The writings of this unfortunate person are numerous, and in their matter exceedingly various. The principal are the blank verse poem, called 'Thoughts in Prison,' which was composed in the interval between his conviction and execution, and the well known 'Reflections on Death,' 1763.

DODDER. [CUSCUTACEÆ.]

DODDRIDGE, PHILIP, D.D. (born in London in 1702, died 1751), a dissenting divine, who, on account of his singularly amiable disposition and manners, his ministerial assiduity, piety, and learning, is regarded as one of the ornaments of the religious community to which he belonged. It was early perceived that the turn of Doddridge's mind peculiarly pointed to the profession of a minister, and he was entered at a dissenting academy over which Mr. John Jennings presided, at the village of Kibworth in Leicestershire, in 1718 or 1719, and in 1722 commenced his ministry at Kibworth.

Several years passed, during which Doddridge led the life of a non-conformist minister, his ser-

vices being divided between the people who attended the chapel at Kibworth, and the congregation at the neighbouring town of Market Harborough. He was diligent in his ministry, but he found time for much theological reading.

In 1729 he began his academy, which soon attained a high reputation. It was the institution in which most of the more distinguished ministers of the Old Dissenters in the middle of the 18th century were educated. It was first established at Market Harborough, where he at the time resided; but before the end of the year he removed to Northampton, having been invited to become the minister of the dissenting congregation in that town; and at Northampton he continued, both as pastor of the dissenting congregation and head of the dissenting academy, till his death. He died at Lisbon thirteen days after his arrival. He had gone thither with little hope of recovery.

Besides his sermons and some hymns, Dr. Doddridge was the author of 'The Rise and Progress of Religion in the Soul,' and of 'The Family Expositor,' both of which were very popular, and have been often reprinted.

Two accounts of his life have been published: the first by Job Orton; the second by Dr. Kippis, in the 'Biographia Britannica,' of which he was the editor.

DODE'CAGON, a figure of twelve sides; a term generally applied to an equiangular and equilateral (or regular) dodecagon.

DODECAGY'NIA, the name of any order in the Linnæan classification of plants wherein the number of styles is twelve.

DODECAHEDRON. [Regular Figures.]

DODECA'NDRIA, the twelfth class in the Linnæan classification of plants. It contains species having twelve or about twelve stamens, provided they do not adhere by their filaments.

DODO, DIDUS, DIDINÆ, a family of wingless birds (or rather of birds incapable of flight from the rudimentary condition of their wings), now extinct; but which, within a very recent date, occupied the islands of Mauritius, Rodriguez, and Bourbon, each island, as it would appear, possessing distinct species of the same family. Of these, one is the Dodo, another the Solitaire, species now ascertained to be distinct, though they have hitherto been generally regarded as identical; yet the description and figure of the Solitaire by Leguat in his account of the isle of Diego-Rodrigo (Rodriguez), so much differs from those of the Dodo, Dronte, or Dod-aers, by various authors of the 16th and early part of the 17th century, as to lead to a suspicion, independently of other evidence, that, however allied these birds might have been, they were specifically different.

In 1545, the islands now called Bourbon, Mauritius, and Rodriguez, were discovered by the Portuguese, who termed them the Mascarenhas Isles, from the name of the Portuguese navigator. Till then perhaps no human foot had ever trod upon them. The shores abounded with marine tortoises or turtles, and these flightless birds dwelt unmolested on the land. It was not however on these islands exclusively that birds of this group existed; for previously to 1545, Vasco de Gama in 1497, after doubling Cabo Tormentosa, or the Cape of Storms (now the Cape of Good Hope), discovered at 60 leagues beyond it a bay, Agra de San Blaz, near an isle on which he saw a great number of birds in the form of a goose, but with wings like those of bats, which the sailors called Solitaries. On their return in 1499 the Portuguese touched again at San Blaz, where they took a great number of these birds, and, comparing them to swans, called the island 'Ilha des Cisnes,' Isle of Swans. Whether these birds were identical with Leguat's Solitaire we have no means of ascertaining. Leguat examined the island of Rodriguez in 1694. This island, though previously known, had not perhaps been visited, being surrounded by coral reefs, and destitute of secure anchorage. Here Leguat, who remained some time on the island, with a view to colonization, found the Solitaire, or the Solitary, so called because it never congregates in flocks, though it is very abundant. The following is a brief summary of Leguat's description. The males have generally a grayish or brown plumage; the feet of a turkey, and also the beak, but a little more hooked; they have hardly any tail, and their rump, covered with feathers, is rounded like the croup of a horse. They stand higher than the turkey cock, and have a straight neck, a little longer in proportion than it is in that bird, when it raises its head. The eye is black and lively, and the head without any crest or tuft. They do not fly, their wings being too short to support the weight of their bodies; they only use them in beating their sides and in whirling round. The females, he states, are of a blood or pale brown colour; they build a nest with leaves of the palm-tree on a clear spot of ground, and lay a single egg larger than that of a goose, which the male and female cover by turns. The young one remains several months under the care of its parents, which continue united through life, never leaving each other. The weight of the males is forty-five or fifty pounds, and the flesh is a delicacy.

In this description we have several important points in which the Solitaire differs from the Dodo: the head is not hooded, the beak is not large, the stature is tall, and the neck and legs are larger than in the Dodo. Leguat's figure, though rude, represents these characters.

Let us now turn to the descriptions and figures of the Dodo, of the correctness of which the head and foot in the Ashmolean Museum, and the foot in the British Museum, are sufficient proofs. In the Voyage to the East Indies in 1598 by Jacob van Neck and Wybrand van Warwijk (4to., Amsterdam, 1648), there is a description of the *Walgh-Vögels* (Dodo), in the island of Cerne, now called Mauritius, as being equal in size to our swans, with large heads and a kind of hood thereon; no wings, but in place of them three or four black little pens, and their tails consist of four or five curled plumelets of a grayish colour. The breast is spoken of as very good; but it is stated that the voyagers preferred some turtle doves that they found there. De Bry, in his description of the island of Cerne ('Quinta Pars Indiæ Orientalis,' &c., MDCI), gives the following details:—'Cærulian parrots also are there in great num-

bers, as well as other birds; besides which there is another larger kind, greater than our swans, with vast heads, one half being covered with a skin, as it were hooded. These birds are without wings, in the place of which are three or four rather black feathers. A few curved delicate ash-coloured feathers constitute the tail. These birds we call Walck-Vögel, because the longer they were cooked, the more unfit for food they became. Their bellies and breasts were nevertheless of a pleasant flavour, and easy of mastication. Another cause for the appellation we gave them was the preferable abundance of turtle doves, which were of a far sweeter and more grateful flavour.' In the frontispiece to De Bry, surmounting the architectural design of the title-page, will be found, we believe, the earliest engravings of the Dodo: a pair of these birds stand on the cornice on each side, and the following cut is taken from the figure on the left hand.

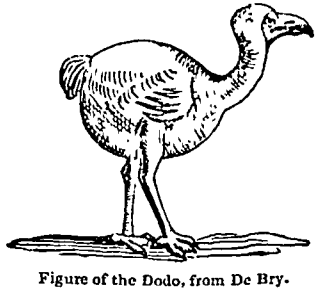


Figure of the Dodo, from De Bry.

Clusius in his 'Exotica,' 1605, gives a figure of the Dodo taken from a sketch from nature by a Dutch voyager, who had seen the bird in 1598. In the voyage of Jacob Heemskirk, and Wolfert Harmansz to the East Indies in 1601–2–3, and in Willem Ysbrantsz Bontekoe van Hoorn's 'Journal of the East India Voyage,' &c., in 1618 to 1624, the Dodo is noticed as inhabiting the Mauritius. Herbert in his 'Travels,' 1634, describes and figures the Dodo, and it is also described and figured well by Bontius, 1658. Clusius terms this bird *Gallus gallinaceus peregrinus*, and after describing it, says: 'After I had composed and writ down the history of this bird with as much diligence and faithfulness as I could, I happened to see in the house of Peter Pauwius, primary professor of physic in the University of Leyden, a leg thereof cut off at the knee, lately brought over out of the island of Mauritius. It was not very long from the knee to the bending of the foot, being little more than four inches, but of a great thickness, so that it was almost four inches in compass and covered with thickset scales, on the upper side broader, and of a yellowish colour; on the under or back side of the leg, lesser and dusky. The upper side of the toes was also covered with broad scales, the under side wholly callous. The toes were short for so thick a leg, for the length of the greatest or middlemost toe to the nail did not much exceed two inches. That of the other toe next it scarce came up to two inches: the back toe fell something short of an inch and a half; the claws of all were thick, hard, black, less than an inch long; but that of the back toe longer than the rest, exceeding an inch.' Willughby's transl. The leg in the British Museum gives the following admeasurements. Tarsus, 4½ inches. Circumference, 4 inches. Middle toe, 3 inches. Back toe, 1½ inch. Front claws, much worn, 8 lines; back claw, also much worn, shorter.

To these details much more might be added, and descriptions quoted from various writers of unquestionable authority. Of the latter we shall select one only, that of Bontius, who thus writes on the *Dronte*, or *Dod-aers*. After stating that among the islands of the East Indies is that which is called Cerne by some, but Mauritius 'a nostratibus,' especially celebrated for its ebony, and that in the said island a bird 'miræ conformationis' called *Dronte* abounds, he proceeds to tell us—we take Willughby's translation—that it is 'for bigness, of mean size between an ostrich and a turkey, from which it partly differs in shape, and partly agrees with them, especially with the African ostriches, if you consider the rump, quills, and feathers: so that it was like a pigmy among them, if you regard the shortness of its legs. It hath a great ill favoured head, covered with a kind of membrane resembling a hood; great black eyes; a bending prominent fat neck; an extraordinary long, strong, bluish-white bill, only the ends of each mandible are of a different colour, that of the upper black, that of the nether yellowish, both sharp-pointed and crooked. It gapes huge wide as being naturally very voracious. Its body is fat, round, covered with soft gray feathers, after the manner of an ostrich: in each side, instead of hard wing-feathers, or quills, it is furnished with small soft-feathered wings, of a yellowish ash colour; and behind, the rump, instead of a tail, is adorned with five small curled feathers of the same colour. It hath yellow legs, thick, but very short; four toes in each foot, solid, long, as it were scaly, armed with strong black claws. It is a slow-paced and stupid bird, and which easily becomes a prey to the fowlers. The flesh, especially of the breast, is fat, esculent, and so copious, that three or four *Dodos* will sometimes suffice to fill a hundred seamen's bellies. If they be old, or not well boiled, they are of difficult concoction, and are salted and stored up for provision of victual. There are found in their stomachs stones of an ash colour, of divers figures and magnitudes; yet not bred there, as the common people and seamen fancy, but swallowed by the bird; as though by this mark also nature would manifest that these fowl are of the ostrich kind, in that they swallow any hard things, though they do not digest them.'

In one point Bontius differs from Clusius and others, who describe the wings as composed of *black* feathers; nevertheless, in the painting in the British Museum, they are ash coloured. This painting, we may observe, is the copy of an original taken from a living specimen sent to Holland from the Mauritius, while that island was held by the Dutch. This copy was the property of Sir Hans Sloane, and afterwards of Edwards, by whom it was deposited in the Museum. Formerly a perfect specimen, noticed by Ray, existed in the

Tradescants' Museum. This specimen afterwards passed into the Ashmolean Museum at Oxford, where it existed so late as 1700; it subsequently fell into decay, and the head and a foot are the only existing relics of it. A breast bone of the Dodo is preserved in the Museum at Paris, and a skull, which before formed part of the Museum of the Duke of Gottorp, has been discovered in the Museum of Copenhagen.

An original painting of the Dodo has been recently detected by Professor Owen, who thus writes to Mr. Broderip respecting it:—'Whilst at the Hague in the summer of 1838, I was much struck with the minuteness and accuracy with which the exotic species of animals had been painted by Savery and Breughel in such subjects as 'Paradise,' 'Orpheus Charming the Beasts,' &c., in which scope was allowed for grouping together a great variety of animals. Understanding that the celebrated menagerie of Prince Maurice afforded the living models to these artists, I sat down one day before Savery's 'Orpheus and the Beasts' to make a list of the species, which the picture sufficiently evinced that the artist had had the opportunity to study alive. Judge of my surprise and pleasure in detecting in a dark corner of the picture (which is badly hung between two windows) the Dodo beautifully finished, showing, for example, though but three inches long, the auricular circle of feathers, the scutation of the tarsi, and the loose structure of the caudal plumes. In the number and proportions of the toes, and in the general form, it accords with Edwards's oil painting in the British Museum; and I conclude that the miniature must have been copied from the study of a living bird, which it is most probable formed part of the Mauritian Menagerie. The bird is standing in profile with a lizard at its feet. Not any of the Dutch naturalists to whom I applied for information respecting the picture, the artist, and his subjects, seemed to be aware of the existence of this evidence of the Dodo in the Hague collection.'

There is good reason to believe that a living Dodo was exhibited in England in 1638. (Sloane's MSS., No. 1839, 5, p. 108, Brit. Mus. See the edition of Sir Thomas Browne's works by Wilkins, published by Pickering.)

It would appear that about the middle of the 17th or beginning of the 18th century the Dodo disappeared. Nothing was heard of it; and we only know that it does not now exist in the islands which abundant testimony proves it to have once inhabited. It is in fact extinct; or if it indeed survive, Madagascar is the most likely spot in which it lingers.

The head of the Dodo in the Ashmolean Museum is very extraordinary; there is something greatly vulture-like in its whole aspect. For example, as we find in many vultures, it was evidently capable of being retracted within a hood or reduplicature of skin, thinly covered with downy feathers. The beak (destitute of its horny sheath) is stout, deep, and powerful, considerably elongated, and strongly hooked at the tip; its base was covered with an extensive cere, or membrane, at the termination of which, near the edge of the upper mandible, are the nostrils, oval and nearly transverse; the gape is wide, extending beyond the eye; the skin of the throat was loose and thinly clothed with feathers. The admeasurements are as follows:—From the eye to the end of the beak six inches; to the nostril three inches; breadth of the skull across the forehead three inches and a quarter; mean depth of beak two inches and a quarter. Though we say the beak of the Dodo is vulture-like, we do not mean to assert that the Dodo is to be referred to the vulture tribe, an opinion, however, which has been maintained by M. De Blainville and others; while, on the contrary, several eminent zoologists have as strenuously contended for its affinity to the ostrich, cassowary, &c. Temminck places the Dodo with the Apteryx in an order termed *Inertes*, and Illiger instituted the order *Inepti* for the Dodo alone.

Very recently the rigid examination of all accessible relics of the Dodo by H. E. Strickland, Esq., and A. G. Melville, M.D. (and several osseous remains have lately been recovered from obscurity), has tended to throw a new light upon the character of this mysterious bird and its ally the Solitaire; and we learn, not indeed without surprise, that they display, as far as their relics have been investigated, a decided affinity to the Columbine or pigeon tribe. Till however the promised work 'On the Natural History and Osteology of the Dodo and Solitaire' makes its appearance, we may be excused from hazarding any decided opinion.

In concluding this brief notice of the Dodo, we refer our readers to a paper by P. B. Duncan, Esq., in the 'Zoological Journal,' which contains an admirable summary of its history from the time of its discovery to that of its disappearance.

DODO'NA, the most ancient oracle of Greece, was probably situated in the valley of Joannina in Epirus, but its exact position has never been ascertained. The temple at Dodona was dedicated to Jupiter, and was of Pelasgian origin. The oracles were delivered from an oak. The temple at Dodona was entirely destroyed by Dosimachus, the Ætolian prætor, B.C. 219 (Polyb. iv. 67), and probably was never restored, for it did not exist in the time of Strabo.

There is a long article on Dodona in the Fragment of Stephanus Byzantinus, which is printed at the end of the work in the edition of Pinedo.

DODSLEY, ROBERT, was born in 1709, at Mansfield, in Nottinghamshire. He was apprenticed to a stocking-weaver, but, disliking the business, he became a footman. While in the service of the Hon. Mrs. Lowther, he published by subscription, in 1732, an octavo volume of poetical pieces, under the title of 'The Muse in Livery, or the Footman's Miscellany.' The poetry was of no remarkable merit, but attracted attention from the situation of the author. His next production was a dramatic piece called 'The Toyshop;' which was acted at Covent Garden theatre in 1735 with great success. With the profits of his play Dodsley the same year set up as a bookseller; and, from his own business-like habits and attention, together with the patronage which

his reputation and talents as an author procured him, he was highly successful. He continued throughout his life to produce a number of works of varying degrees of merit, both in prose and verse. In 1737 his farce of 'The King and the Miller of Mansfield' was acted at Drury Lane with great applause. It was followed the same year by a sequel, under the title of 'Sir John Cockle at Court,' and in 1741, by the farce of 'The Blind Beggar of Bethnal Green,' which were unsuccessful. A collected edition of all his dramas was published in 1748, in a volume, to which he gave the title of 'Trifles.' (A second volume was published under the title of 'Miscellanies,' in 1772.)

In 1750 appeared anonymously his ingenious and well known little work, 'The Economy of Human Life,' which was long extremely popular. In 1758 he produced the tragedy of 'Cleone,' which was acted at Covent Garden with extraordinary applause, and drew crowded audiences during a long run. When it was published, 2000 copies were sold the first day, and it reached a fourth edition within the year. Dodsley died at Durham, while on a visit to a friend, on the 25th of September, 1764. Dodsley produced many other works besides those we have mentioned, and his name is associated with several works of which he was only the projector and the publisher, among which we may particularly mention 'The Museum,' 'The World,' 'The Preceptor,' and above all 'The Annual Register,' which is still continued.

(*Biographia Britannica;* Nichols's *Literary Anecdotes of the Eighteenth Century.*)

DODSWORTH, ROGER, was born July 24, 1585, at Newton Grange, in the parish of St. Oswald, in Rydale, Yorkshire. He died in August, 1654, and was buried at Rufford in Lancashire. His manuscript collections, partly relating to Yorkshire, in a hundred and sixty-two volumes folio and quarto, a hundred and twenty-two of them in his own hand-writing, are now in the Bodleian Library at Oxford.

Dodsworth was the projector, and collected many of the materials for the early part of the work now known as 'Dugdale's Monasticon,' in the title page of the first volume of which his name appears as one of the compilers.

DODWELL, HENRY, was born in Dublin in 1642, but his father came over to England, and settled at York, in 1648. Young Dodwell was there sent to the free school, where he remained for five years. In 1654, after the death of his father and mother, he was taken under the protection of a brother of his mother's, at whose expense he was sent, in 1656, to Trinity College, Dublin. Here he obtained a fellowship, which he relinquished in 1666, owing to certain conscientious scruples against taking holy orders. Dodwell had published something before he settled in London, in 1674, from which time he was an active writer. Many of his publications were on the popish and nonconformist controversies; they have the reputation of showing, like every thing else he wrote, extensive and minute learning, and great skill in the application of his scholarship, but little judgment. Few, if any, of the champions of the church of England have strained the pretensions of that establishment so far as Dodwell seems to have done; but his whole life attested the perfect conscientiousness under which he wrote and acted. In 1688 he was elected Camden Professor of History by the University of Oxford, but was deprived of his office, after he had held it about three years, for refusing to take the oath of allegiance to William and Mary. He now retired to the village of Cookham in Berkshire, and soon after to Shottesbrooke in the same neighbourhood, where he spent the rest of his days. He married in 1694, and lived to see himself the father of ten children. The works for which he is now chiefly remembered were also all produced in the latter part of his life. Among these are his Dissertations and Annotations on the Greek Geographers, published in Hudson's 'Geographiæ Veteris Scriptores Græci Minores,' Oxon. 1698, 1703, and 1712; his 'Annales Thucydidei et Xenophontei,' 1696; his 'Chronologia Græco-Romana pro Hypothesibus Dion. Halicarnassei,' 1692; and his 'Annales Velleiani, Quintiliani, Statiani,' 1698. Dodwell's principal work is considered to be his 'De Veteribus Græcorum Romanorumque Cyclis, obiterque de Cyclo Judæorum ac Ætate Christi, Dissertationes,' 4to., Oxon., 1701. Dodwell died at Shottesbrooke on the 7th of June, 1711.

DODWELL, EDWARD, was a man of fortune, and was educated at Trinity College, Cambridge. He left the University in 1800, and from that time till his death in May, 1832, he mostly resided abroad, and occupied himself in researches connected with the earlier antiquities of Greece and her colonies. In 1819 appeared two quarto volumes entitled 'A Classical and Topographical Tour through Greece during the years 1801, 1805, and 1806.' This learned work was followed in 1821 by a folio volume of 'Views in Greece, from Drawings by Edward Dodwell, Esq.,' containing thirty coloured prints, accompanied by short descriptions in French and English, from a collection of nearly a thousand drawings which he had made of architectural objects and natural scenery. He left on his death a very large collection of drawings, from which a folio volume of lithographic plates was published at London, in 1834, under the title of 'Views and Descriptions of Cyclopian or Pelasgic Remains, in Greece and Italy; with Constructions of a later period; from Drawings by the late Edward Dodwell, Esq., F.S.A., and member of several foreign academies; intended as a Supplement to his Classical and Topographical Tour in Greece,' &c. Of the views, 71 are Grecian, 55 Italian.

(*Editor's Preface to the Views of Cyclopian Remains; Mr. Dodwell's Works.*)

DOG. Under the title of *Dog* (Genus *Canis*, Linn.; family, *Canidæ* of modern writers) is comprehended not only the faithful domestic quadruped to which the term more particularly belongs, but all the animals of the carnivorous order which are in immediate alliance with it, as the wolf, the jackal, the fox, and the Cape hunting dog, or Lycaon, which constitute the representatives of a natural family.

The Linnæan genus *Canis*, or family *Canidæ*, is resolvable into three well-marked sections.

1. Those genera which have the pupil of the eye round—including the dogs properly so called, the wolves, and the jackals.

2. Those genera in which the pupil of the eye contracts in the form of a vertical slit, and in which the tail is long and tufted, and the muzzle acute, as the foxes and zerdas.

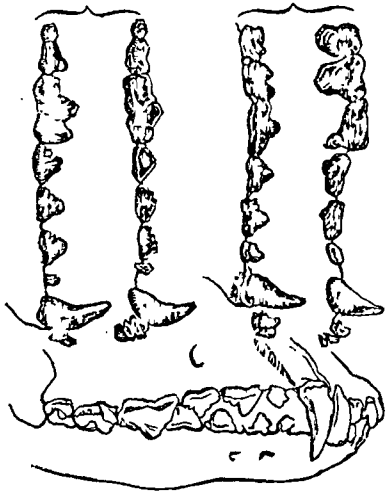
3. Dogs with hyæna-like feet, four toes on each anterior foot, and four on each posterior, as the Cape hunting dog (*Canis pictus*, Desm.; *Lycaon tricolor*, Brookes; *Hyæna picta*, Temminck).

The variations in the dentition of the Canidæ are very trifling. The dental formula is as follows:—

$$\text{Incisors, } \frac{6}{6}; \text{ Canines, } \frac{1-1}{1-1}; \text{ Molars, false, } \frac{3-3}{4-4};$$

$$\text{Carnassières, } \frac{1-1}{1-1}; \text{ Molars, true, } \frac{2-2}{2-2} = 42.$$

The true molars below are small; the last is even minute, as is the first false molar both above and below; and these teeth often drop out early.



Teeth of Dog.

The fore feet (except in *Lycaon*) have five toes; the hind feet four toes, and sometimes a fifth (or dew claw) on the tarsus. Claws not retractile. Digitigrade.

It is to the dog properly so called that the present article is restricted. The other sub-families are treated of under their respective titles.

Linnæus characterises the *Canis familiaris* as 'Canis caudâ sinistrorsum recurvata,' dog with tail curled towards the left; and his description, after enumerating eleven varieties, is minute and accurate. Into such details however we need not enter. All are acquainted with the habits, manners, and peculiarities of this faithful animal, which, domesticated from the earliest times, has followed man through all countries as his servant and friend, and inhabits alike the icebound regions of the arctic circle, those of the temperate latitudes, and those of the torrid zone.

In size, in the development of the limbs, in the length of the tail, in the form of the head, muzzle, and ears, in the quality and length of the hair, and in colour, the domestic dog offers an endless variety. To many of these varieties distinguishing names have been given, as mastiff, bulldog, hound, terrier, spaniel, &c., until at last we come to anomalous breeds, termed mongrels, 'of no mark or likelihood,' and of intermingled lineage.

And now comes the question—What was the parent stock of this domestic animal, so varied in its characteristics, and so ever varying? Can we point out its primæval wild type? We unhesitatingly answer, No. We neither know its origin, nor where, nor under what circumstances, nor by what means, man has rendered the dog dependent upon him, and so riveted the chains of its bondage that the dog would not throw them off if it could.

Some celebrated naturalists, and among them Pallas, have contended that the dog never existed in a state of primitive nature. They assign to it an artificial origin, and regard it as the result of the intermixture of several species closely allied to each other, among which may be enumerated the wolf and the jackal. Pennant and others, again, regard the dog as a descendant of the jackal; and others of the wolf. The opinion of Pallas, strange as it may appear, is not unworthy of consideration; but we have 'no means of proving it. Certain it is however that the dog and wolf, and the dog and jackal, will breed together, and, as the experiments of Buffon proved, that the hybrids of the former continue to be prolific *inter se*, for several generations. Yet we cannot allow that the wolf and dog are specifically identical. The same observations apply to the dingo of Australia, which we cannot admit to be specifically identical with the domestic dog, and which indeed does not breed readily with the latter, though a breed of hybrids is said to be established in New Holland. Dogs introduced from Europe have intermixed with the semi-domesticated race of the Patagonians and natives of Tierra del Fuego, confessedly an aboriginal race, and amongst the Society Islands the aboriginal Poe dog, 'which was formerly eaten by the natives, is now extinct, or merged into mongrel breeds by propagation with many exotic varieties.' According to Colonel Hamilton Smith, the Black Wolfdog of the Florida Indians is evidently intermediate between the original Newfoundland dog and the wolf. That the Esquimaux dogs and the wolf breed together, notwithstanding their mutual hostility, is, we believe, an established fact. (Richardson's 'Fauna Boreali-Americana.') That the wolf has crossed with the dog in the northern latitudes, the jackal in middle and Southern Asia, and the Aguara dogs of South America have intermixed with introduced European breeds, cannot, we think, be denied. Yet all these crossed races will interbreed with each other, and produce a blended stock. Have we not here then something like a factitious race, the re-

sult of a mixture of nearly allied primitive species? Admitting all this, still one original species, or two or more original species, must have been reclaimed and domesticated in the commencement. Can any of these be pointed out? With regard to the dogs possessed by the American Indians, they were Aguaras (genus *Dusicyon*, Col. H. Smith). Of these fox-looking dogs were the Indians possessed when South America was discovered by the Spaniards. Speaking of these Aguara dogs, Col. H. Smith says, 'Several can be sufficiently tamed to accompany their masters to hunt in the forest, without however being able to undergo much fatigue; for when they find the sport not to their liking, they return home to await the return of the sportsman. In domesticity they are excessive thieves, and go to prowl in the forest. Though, in company with man, the domesticated Aguara will eagerly join in the chase of the jaguar, we have never heard that they are in the same state of hostility towards *felidæ* as are their congeners in Asia and Africa. The native Indians, who have domestic dogs of European origin, invariably use the Spanish term Perro, and greatly promote the increase of the breed, in preference to their own, which they consider to be derived entirely or with a cross from the Aguaras of the woods; and by this name of Aguara it is plain throughout almost all the interior of South America that the whole group of indigenous canines is understood. Domestic dogs of the true unmixed Aguara strain are now never to be seen.

However extensively the Aguara dog may have been domesticated by the Indians of South America, it is most assuredly not the foundation-type of the *canis familiaris*. It was merely reclaimed by savage tribes, who being destitute of the true dog, and needing assistance in the chase, rendered it as available for their purpose as they could, and have now discarded it, or so crossed it as to have obliterated its original characters. The question therefore is still open. Mr. Bell, in his 'History of British Quadrupeds,' approaches the subject boldly. He contends that the primitive origin of the domestic dog is to be found in the wolf; and on the following grounds. Similarity of form—the period of gestation, 63 days in each case; the fact of a fertile offspring being the result of the union of the wolf and dog; and the circumstance of many wild dogs approximating in external characters to the wolf, as exemplified in the Dhole of India, and the Dingo of Australia. With respect to the first three grounds, we cannot admit them to be conclusive; they only prove a close alliance. Besides, what species of wolf are we to look to? Two species, according to Cuvier, are European, viz. *Canis Lupus*, and *Canis Lycaon*, and from those the Dusky Wolf, the Gray Wolf, the *Canis Latrans* of North America, and the Mexican Wolf are still distinct. We mention these, because it is with the gray wolf that the Esquimaux dog so often breeds, and which it so much resembles in aspect. The differences in the skull of the gray wolf of the high latitudes of North America and of the ordinary European wolf are very decided. And let it not here be forgotten, that Hunter, who instituted a series of experiments in order to ascertain whether the wolf and jackal would breed with the dog, on finding the affirmative to be true in both instances, came to the conclusion that the dog, wolf, and jackal are one species. Surely no one will contend that the jackal and wolf are identical, though both will breed with the dog. Moreover we have no proof that hybrids between the jackal and dog are fertile inter se, and if those between the wolf and dog are so, it is only for a few removes; but, on the other hand, the hybrid between the dog and wolf breeds freely with either side, and the progeny may admit of frequent crossings; and it is thus perhaps that the dogs of the higher latitudes of Europe, Asia, and America, have assumed their wolf-like appearance.

When Mr. Bull speaks of the 'existence of dogs in such a state of wildness as to have lost that common character of domestication, variety of colour and marking;' and to have acquired the original wolfish characters to a certain degree, he evidently supposes the Dhole and Dingo to be the emancipated descendants of a once domesticated race. To this view we cannot give our assent. There are indeed in various parts of northern Europe, and in Asia, in America, and some of the islands, as St. Domingo, troops of *Chiens marons*, *maroon* or *feral* dogs; and among these may be reckoned the wild Pariah dogs of the jungles of India, offsets from the Pariahs of the towns and villages. Wild or rather *feral* dogs exist in Natolia, and in many parts of Russia, prowling at night about the villages and even the towns, and of these many are wolf-like in appearance; but independently of these there are several species of *true wild dogs*, among which we include the Dingo of Australia (where we believe another species also exists); and several belonging to India and the Indian Islands. We can only cursorily notice them. We may enumerate the following:—viz., the *Búánsú* or wild dog of Nepâl (*Canis primævus*, Hodgson), the *Dhole* of the Mahablishwar in the Presidency of Bombay, and the wild dog of the Deccan (*Canis Dukhunensis*, Sykes), called by the Mahrattas *Kolsun*. ('Proceed. Zool. Soc.,' 1833, pp. 111, 133.) There is every reason to believe that these dogs are specifically identical; they hunt in packs, and differ in aspect both from the jackal and wolf. To this species the *Quyo* or *Quihoe* of Dr. Sprye appears also to be referable. A wild dog called the *Wah*, probably distinct, is found in central India. A red wild dog, not unlike the Dingo, is a native of some parts of China. Captain Williamson and Dr. D. Johnson describe a Dhole or Quihoe of the Rhamghur Hills (*Canis Quao* of Gen. Hardwick). A wild dog, first described by Vosmaer (*Canis Ceylonicus*), inhabits the remote parts of Ceylon; another species (*Canis Sumatrensis*), the Island of Sumatra; and another the forests of Java (*Canis Javanicus*). In Ethiopia, Congo, and other parts of Africa, true wild dogs exist; the *Mâlbia* of Congo assembles in troops and hunts down its prey, but avoids man.

These are true *wild dogs* and not *wolves;* and though we pretend not to say that from any of these

or others unnoticed the domestic dog has sprung, still, seeing that wild dogs distinct from wolves exist, it is to some such animal or animals that we are inclined to attribute the origin of our dog, whatever crosses it may have had, rather than to the wolf. From the earliest ages the wolf and dog have been distinguished from each other, and no feral dog has ever assumed the characters of the former.

We shall not enter into an enumeration of our multitudinous breeds of dogs; their respective qualities are well known to all; and man has availed himself of their sagacity, their courage, their powers of scent, and their fleetness.

The dog is born blind, and begins to see about the 12th day. Its duration of life is from 14 or 15 to 20 years. Its teeth commence their change about the 14th month, and it attains to maturity in two years. The female has from six to ten mammæ, not always in pairs. The number of young at a birth averages from five or six to eight, sometimes one or two more.

For more explicit details see the work on 'Dogs,' by Col. H. Smith, in the 'Naturalist's Library;' 'The Dog,' by Youatt, in the 'Farmer's Library;' the 'History of the Dog,' by W. C. L. Martin; and Buffon's 'Histoire Naturelle.'

Fossil Dogs.—It may be doubtful whether any fossil remains of the *Dog*, properly so called, have ever been found. The occurrence of the bones of the wolf and the fox in the ossiferous caverns, &c., is well known; but, in pursuing this part of the inquiry, it should be remembered how difficult it is to distinguish the bones of the wolf from those of the *mâtin*, as Cuvier observes, and the Shepherd's Dog. The *Canis spelæus* of Goldfuss, the remains of which were found at Gailenreuth, bears the strongest resemblance in the form of the cranium generally to the wolf, but the muzzle is shorter, and the palate is wider. The *Agnotherium* of Kaup is described by him to have been as large as a lion, and to be allied to the dog.

DOG'S-TAIL GRASS. [CYNOSURUS CRISTATUS.]

DOG-WOOD, the English name of various deciduous-leaved shrubs belonging to the genus *Cornus*. [CORNUS.]

DOGE. [GENOA; VENICE.]

DOGMA (δόγμα), a word borrowed from the Greek, means an established principle, a fundamental article of belief derived from undisputed authority, and is generally applied to the essential doctrines of Christianity which are drawn from the Scriptures, or from the authority of the Fathers. Hence that branch of divinity called dogmatic theology is an exposition and assertion of the various articles of the Christian faith as founded upon authority acknowledged by Christians in general, and is distinguished from scholastic theology, which assumes to establish the truth of the Christian doctrines by argument. Dogmatic theology, as distinct from scholastic as well as from moral theology and biblical divinity, constitutes a separate chair in several Roman Catholic universities in continental Europe. In the Protestant Universities of Germany there is a chair for the history of dogmas.

DOIT or DUYT, a small Dutch copper coin, being the eighth part of a stiver, in value half a farthing. The word is used by Shakspere, *Coriolanus*, act i., sc. 5.

DOL. [ILLE-ET-VILAINE.]

DOLABRIFORM, a term applied in botany to certain fleshy leaves, which are straight at the front, taper at the base, compressed, dilated, rounded, and thinned away at the upper end at the back, so as to bear some resemblance to an old-fashioned axe-head.

DOLCI, CARLO, was born at Florence, May 25, 1616. His father was a painter, but died when Carlo was only four years old, and at the age of nine he was placed with Jacopo Vignali. His first efforts attracted the notice of Piero de' Medici, and he soon became very busily and profitably employed. About 1670 he was invited to paint the likeness of Claudia, the daughter of Ferdinand of Austria, at Innspruck. After his return he was afflicted with melancholy, and died Jan. 17, 1686.

From his first attempts at painting, Carlo determined to paint none but sacred subjects, and he almost literally observed this rule. His style is pleasing, and full of gentle and tender expressions; his drawing for the most part, but not always, correct; his colouring varied, soft, bright, and harmonious; sometimes too pearly in its tint. His pictures are found in many collections.

DOLCIGNO, or DULCIGNO, a town in Albania, W. of Scutari, near the mouth of the Bojana, on the coast of the Adriatic, has a good harbour, and about 2000 inhabitants, who were formerly notorious for piracy, but are now chiefly engaged in the oil trade of the neighbourhood, and in conveying to Scutari in lighters the cargoes of such vessels as cannot enter the Bojana. [ALBANIA.]

DÔLE, a town in the department of Jura in France, stands on the right bank of the Doubs, a feeder of the Saône, at a distance of 221 miles S.E. from Paris on the road to Geneva, in 47° 6′ N. lat., 5° 30′ E. long., and has 10,713 inhabitants. It is pleasantly situated on the crest and slope of a hill; the streets are rather steep, but well built and ornamented with fountains; and the neighbourhood is prettily laid out in gardens, vineyards, and promenades. The parish church on the Place Royale is a handsome gothic building. The ancient tower of Vergy still stands, and is now used as a prison. The other remarkable buildings are—the New Prison, the former Jesuit college, the court-house, the museum, and the bridge over the Doubs. The town has tribunals of first instance and of commerce, a college, public library, school of design, several hospitals, and a theatre. It is well situated for trade on the canal that joins the Rhône and Rhine. Hosiery, tiles and pottery, chemical products, vinegar, and beer are manufactured; there are also iron smelting furnaces supplied with ore from the neighbouring mines, flour mills, and establishments for the rearing of silkworms; corn, flour, wine, wood, charcoal, marble, and iron enter into the commerce of the town. A ruined aqueduct and amphitheatre, and

some remains of the old Roman road from Lyon to the Rhine, mark the place as having been a Roman station. The town formerly belonged to the dukes of Burgundy, and is famous for its sieges. In 1435 the inhabitants gallantly repulsed the duke of Bourbon, who wished to wrest the place from Mary of Burgundy; but in 1479 the French took it by treachery, massacred the inhabitants, and burnt the town. Of the few buildings that escaped this destruction, the tower of Vergy alone still exists. Dôle afterwards came into the hands of the Spaniards with the rest of Franche-Comté, of which it was for some time the capital. Charles V. added to the fortifications in 1530. In 1636 it was fiercely but ineffectually besieged by the Prince of Condé; Louis XIV. took it in 1668, and again in 1674, when he demolished the fortifications. By the treaty of Nimeguen the town, together with the whole of Franche-Comté was made over to France. (*Dictionnaire de la France.*)

DOLGELLY. [MERIONETHSHIRE.]

DO'LICHOS. Under this name Linnæus included the greater part of those tropical twining leguminous plants which bear eatable fruit like the kidney-beans cultivated in Europe. A large number of species, ill distinguished from each other, and differing materially in the structure of their fructification, were for a long time collected under this name.

The genus *Mucuna*, known by its oblong puckered compressed hispid pods, includes all the species from which Cowhage is obtained.

DOLLAR. [MONEY.]

DOLLOND, JOHN, an eminent optician, was descended from a French refugee family, settled in Spitalfields, London, and was born June 10th, 1706. His father was an operative silk-weaver, and his own boyhood was spent in the drudgery of a manufactory; he found time however to make considerable progress in the study of mathematics and natural philosophy; besides which he cultivated anatomy, and devoted his leisure moments to ecclesiastical history. This last subject led him to the study of the Greek and Latin languages; and he was, besides, intimately acquainted with the French, German, and Italian.

Mr. Dollond married early in life, and had two sons besides three daughters. His eldest son, Peter, who had been apprenticed to an optical instrument maker, established himself in that business, in London, and Mr. Dollond, quitting his former occupation, entered into partnership with his son in 1752.

About three years from this time Mr. Dollond commenced a series of experiments on the dispersion of light, and in 1757 he made the decisive experiment which showed the error of Newton's conclusion respecting the proportional refrangibility of light in all media. [LIGHT.] Its results were contained in a paper which was printed in the 'Philosophical Transactions' of the Royal Society, for 1758; and, in consequence of the discovery, Mr. Dollond was enabled to construct what are called achromatic telescopes, or such as afford images of objects almost wholly free from coloured fringes. The discovery was rewarded, by the Council of the Royal Society, with the Copley medal.

It is remarkable that a private gentleman named Hall, as early as the year 1733 had caused telescopes which showed objects free from coloured fringes to be constructed; but, as these were not made public, there is no evidence that Mr. Dollond had any knowledge of them; and both parties must therefore be considered as independent discoverers of the principle.

In the beginning of the year 1761 Dollond was elected a Fellow of the Royal Society, and appointed optician to the king. He did not long survive to enjoy the honour or advantages of his discoveries, as, on the 30th of September of that year, he was attacked by a fit of apoplexy, brought on by too close and long-continued application to a paper which he was studying. The attack immediately deprived him of speech, and in a few hours of life itself.

His two sons carried on the business conjointly with great reputation and success; and, upon the death of the younger, it went into the hands of a nephew, who took the family name, and who still carries it on without diminution of the high character attached to the name of Dollond.

Mr. Dollond's appearance was somewhat stern, and his address and language impressive; but his manners were cheerful, kind, and affable. He adhered to the religion of his father, and attended the French Protestant Church, of which his life and conversation rendered him an ornament.

The following is the list of Dollond's published papers:—1. A letter to Mr. James Short, F.R.S., concerning an Improvement in Reflecting Telescopes; 'Phil. Trans.,' 1753, p. 103. 2. Letter to James Short, A.M., F.R.S., concerning a mistake in Mr. Euler's Theorem for correcting the Aberration in the Object Glasses of Refracting Telescopes; 'Phil. Trans.,' 1753, p. 287. 3. A Description of a Contrivance for measuring Small Angles; 'Phil. Trans.,' 1753, p. 178. 4. An Explanation of an Instrument for measuring Small Angles; 'Phil. Trans.,' 1754, p. 551. 5. An account of some Experiments concerning the different Refrangibility of Light; 'Phil. Trans.' 1758, p. 733.

DOLOMIEU, DEODAT-GUY-SILVAIN-TANCRE'DE *DE*, was born at Grenoble on the 24th of June, 1750. In early youth he was admitted a member of the religious order of Malta, but in consequence of a duel fatal to his adversary, he received sentence of death, but, after imprisonment, he was pardoned, and went to France. He entered a regiment of carbineers, and formed an acquaintance with La Rochefoucault, which led to his abandonment of the military profession, with a view to the study of science. Soon afterwards he was made a corresponding member of the Academy of Sciences. In 1776 he went to Italy, and studied for some time the geology and natural history of that country. Under the French Republic he was made a member of the Ecole de Mines. He was one of the original members of the National Institute, for which he prepared no fewer than twenty-seven original scientific memoirs in three years.

When Bonaparte went to Egypt, Dolomieu accompanied the expedition; on the arrival of which he visited Alexandria, the Delta, Cairo, the Pyramids, &c. On his passage home he was, with his friend Cordier, the mineralogist, and many others of his countrymen, made prisoner after being driven into the Gulf of Tarentum, and confined in a miserable dungeon. He was imprisoned at Messina; but when, after the battle of Marengo, peace was made with Naples, the first article of the treaty was a stipulation for the immediate release of Dolomieu. On the death of Daubenton he was appointed professor of mineralogy, and soon after his return to France he delivered a course of lectures on the philosophy of mineralogy at the Museum of Natural History. In a short time he again quitted Paris, visited the Alps, and on his return went to Châteauneuf, to visit his sister and his brother-in-law le Comte de Drée: here he was unfortunately attacked by a disorder of which he died Nov. 26, 1801, in the 53rd year of his age.

He had projected two journeys for adding to his vast store of geological knowledge, the first through Germany, and the second through Norway, Denmark, and Sweden. He also proposed to publish a work which he had planned in his prison at Messina; of this he printed a fragment on 'Mineral Species,' which is a monument at once of his misfortunes and his genius, having been written in his dungeon in Sicily, on the margin of a few books, with a bone sharpened against his prison walls for a pen, and the black of his lamp smoke mixed with water for ink. He was an indefatigable explorer in geology and mineralogy, and made many valuable contributions to those sciences. The philosophers of Europe showed their estimate of him by joining in an earnest entreaty for his liberation from the prison at Messina.

DOLOMITE. This rock, having the aspect and general geological history of limestone, but composed of carbonate of magnesia united to carbonate of lime, usually atom to atom, occurs as a part of the oolitic system of the Alps and Apennines, and of the German Jurakalk; and it is perhaps proper to call by the same name the crystallised magnesian limestone of Nottinghamshire, Derbyshire, Yorkshire, and Durham. The best example of this English dolomite is at Bolsover, in Derbyshire, whence the stone is taken to build the new Houses of Parliament. From the manner in which this rock occurs along the Lake of Lugano, and other parts on the south side of the Alps, in direct contact or more frequently in a peculiar relation of propinquity to augitic traps, Von Buch inferred that dolomite was a metamorphic limestone, altered by absorption of magnesian vapours yielded by volcanic action. There is much to recommend this inference. In England we frequently find the mountain limestone *dolomotized*, along lines of fracture and along the sides of mineral veins; and these cases appear to enter into Von Buch's explanation. But the broad magnesian limestones of the North of England are certainly due to original crystallization together of the two carbonates already named. Dolomite is usually very deficient of organic remains. In the Alps and in Franconia its aspect is very picturesque.

DOLPHIN. [WHALES.]

DOMAT, or DOUMAT, JEAN, a distinguished French lawyer, was born at Clermont in Auvergne, on the 30th of November, 1625. He connected himself with the brilliant circle of literary recluses at the Port Royal, among whom his reputation stood high both for jurisprudence and ethics. He was a very modest man, and little is known of his personal history. He was in the confidence of Pascal, attended him on his death-bed, and was intrusted with many of his papers. Domat received a pension from Louis XIV., and took up his abode in Paris, where he received encouragement from D'Aguesseau. Domat married Mademoiselle Blondel, by whom he had thirteen children. He died at Paris on the 14th of March, 1695. His work 'Les Loix Civiles dans leur Ordre naturel, suivies du Droit Public' appeared anonymously in 1689. The author's method of dividing the subject is, by first treating of law in general. The principle of every law, as having a foundation in utility or some other reason connected with morals or religion, is the main feature of the work. The substance of the law is divided into private and public. The former class is subdivided into the law of contracts and the law of succession. The public law is divided into government, official and executorial arrangements, crimes, and procedure civil and criminal. There have been several editions of the work in French, generally in two volumes folio. In 1722 it was translated into English by William Strahan, 'with additional remarks on some material differences between the civil law and the law of England,' 2 vols. folio. Domat paid great attention to the law merchant, and this translation has probably been of use in keeping the mercantile law in general and the admiralty and consistorial systems of England in unison with the civil law, and with the practice of the rest of Europe. Domat's work used to be in high esteem in Scotland before the study of civil law was neglected at the Scottish bar. A posthumous work by Domat, 'Legum Delectus, ex Libris Digestorum et Codicis,' was published at Amsterdam in 1703, 4to.

DOMBES. [BOURGOGNE; AIN.]

DO'MBEYA, a name given by botanists to a Sterculiaceous genus of shrubs or trees inhabiting the East Indies and the Isles of France, Bourbon, and Madagascar.

DOME, a term applied to a covering of the whole or part of a building. The word *dome* is strictly applied to the external part of the spherical or polygonal roof, and *cupola* to the internal part.

The most magnificent dome of antiquity is that of the Pantheon, supposed to be a chamber of the great baths of Agrippa. Internally it is divided into five rows of square compartments, which are supposed to have been decorated with plates of silver. The external part of the dome appears also to have been decorated with bands of bronze. The base of the dome externally consists of a large plinth with six smaller plinths or steps above it; and in the curve of the dome

a flight of steps is formed which leads to the opening at the top. The dome is constructed of bricks and rubble. The thickness is about 17 feet at the base, 5 feet 1½ inches at the top of the highest step, and 4 feet 7 inches at the top of the dome. The circular wall which supports the dome is 20 feet thick.

The Thermæ, or baths, of Caracalla, Titus, Constantine, and Diocletian, were all surmounted by domes. Near Pozzuoli there is a very perfect circular building, with a dome 96 feet in diameter, built of volcanic tufo and pumice stone. The temple of Minerva Medica, without the walls of Rome, had a dome of ten sides built of brick and pumice stone. The dome of Santa Sophia, at Constantinople, built in the reign of Justinian, rests on the square formed at the intersection of the arms of a Greek cross. The dome is supported by four corbellings placed in the angles of the square, surmounted by a kind of cornice which supports a circular gallery. Externally the dome is divided by projecting ribs, rounded and covered with lead. The top is surmounted by a lantern or finishing like a baluster, on which is a cross. The dome of San Vitale, at Ravenna, is curiously constructed. The lower part of the plan is a regular octagon, which is supported by eight piers placed at the angles of the dome; in the spaces between the piers are seven niches, divided into two stories. The wall above the niches sustains a hemispherical dome, the plan being a circle described within a regular octagon. The dome is built with a double row of pipes, hollow at one end and pointed at the other, the point of one being placed in the hollow of the preceding. The dome is covered with mortar both within and without. The church of San Marco at Venice, built in the 10th century, is decorated with five domes. One of these, placed in the centre of the church, is much larger than the others. Each dome is inclosed within four pieces of semi-cylindrical vaulting, forming together a square, in the angles of which are four corbels, which gather in the circular base of each dome. The dome of Santa Maria del Fiore, at Florence, built by Bruneleschi, stands upon an octagon tower 175 feet high. The dome is double, being the first of the kind that is known. The internal dome is connected only at the angles to the external one, and forms a species of gothic vault. The first modern dome constructed in Rome was that of the church of Our Lady of Loretto, built in 1507; it is double, and circular in plan, and is constructed on double consoles.

The dome of St. Peter's at Rome, as planned by Michael Angelo, and executed by himself and succeeding architects, is thus constructed. It stands upon four piers 62 feet high. From the arches spring corbellings, which are finished by an entablature; upon this is a plinth, octagonal within and circular without; upon this is a circular stylobate, 12 feet high. Above the stylobate is the drum of the dome, built of rubble and fragments of brick, and pierced by sixteen lofty windows: the height of the drum is about 52 feet. On this is placed a circular attic story, 19 feet high, and then comes the double dome. The

space between the two domes varies from three to ten feet in width. The thickness of the inner dome is about six feet; the outer dome is of less thickness: the two are joined together by sixteen strong walls or spurs. Above the dome are a lofty lantern and cross: the dome is about 102 feet high above the drum, and the lantern and cross 90 feet above the dome.

The dome of St. Paul's cathedral, London, is placed over the intersection of the four naves. The ground plan is a regular octagon: four of the sides are formed by the four great arches of the naves; the other four sides are formed by false arches of the same size. The corbellings gather in a circle, and are surmounted by a complete entablature decorated with consoles. The drum, which surmounts the entablature, is 62 feet in height; and from the summit of this rises the double dome. The inner dome is much less lofty than the outer: the outer one is constructed of wood, covered with lead.

The dome of the Invalides at Paris is raised on the centre of a Greek cross, on an octagonal base with four large and four small sides. A circular entablature is placed over the corbellings, and on the entablature is raised the drum of the dome. The dome, which is double, rises from a springing common to both. The lower or internal dome, constructed with *masonry*, is spherical; whereas the outer dome is of a spheroidal form, and constructed of stone at the base, and of brick above. The dome of the Pantheon at Paris is constructed entirely of stone, and is placed in the centre of a Greek cross. It is supported by four triangular piers, pierced above with arched openings, and between the piers with the openings are large arches. Between these arches rise the corbellings, which are gathered in to form the circular plan of the drum. The arches and the corbellings are crowned with a large entablature about 13 feet high, and above this is the circular drum, 55 feet high. There are three domes one within another; one forming the interior vault or roof, a second forming the exterior, and a third shaped like the small end of an egg, and intermediate between the other two, for supporting the lantern.

The following admeasurements of most of the principal domes of Europe are from Mr. Ware's 'Tracts on Vaults and Bridges.'

	Feet in diameter externally.	High from the ground line.
Dome of the Pantheon . . .	142	143
„ Minerva Medica . .	78	97
„ Baths of Caracalla . .	112	116
„ Baths of Diocletian .	74	83
Temple of Mercury	68	
„ Diana	98	78
„ Apollo	120	
„ Proserpine and Venus	87	77
Santa Sophia at Constantinople	115	201
Mosque of Achmet, ditto . .	92	120
San Vitale at Ravenna . . .	55	91
San Marco at Venice . . .	44	
Santa Maria del Fiore . . .	139	310
The Chapel of the Medici . .	91	199

Baptistry at Florence . . .	86	110
St. Peter's at Rome	139	330
Ch. of the Madonna at Venice .	70	133
„ Superga at Turin .	64	128
„ Invalides at Paris .	80	173
„ Val de Grace, Paris .	55	133
„ Sorbonne, Paris . .	40	110
Pantheon, Paris	67	190
St. Paul's, London	112	215

DOMENICHI'NO. DOMENI'CO ZAMPIERI, commonly called *Domenichino*, was born at Bologna, in 1581, of poor parents. He studied chiefly under the Caracci, by whom he was highly appreciated. He visited Parma, and then settled for a time in Rome, where, having also studied architecture, he was appointed architect to the apostolic palace by Gregory XV. After the death of that pontiff, he removed to Naples with his wife and children. He died in 1641.

Domenichino was profoundly studied in his drawing, rich and natural in his colouring, and, above all, correct and lifesome in his expression. To the graver design of the Bolognese school Domenichino added something of the ornamental manner of the Venetian, his pictures being rich in the accessories of architecture and costume. His genius however is not characterised by great invention, and he has been accused of borrowing too directly from the works of others; and his draperies have been confessed by his admirers to be harsh and too scanty in the folds.

Domenichino excelled also in landscape. His principal works are at Rome and Naples; among them the Communion of St. Jerome and the Martyrdom of St. Agnes are the most celebrated.

DOMESDAY BOOK, the register of the lands of England, framed by order of King William the Conqueror. It was sometimes termed *Rotulus Wintoniæ*, and was the book from which judgment was to be given upon the value, tenures, and services of the lands therein described. The original is comprised in two volumes, one a large folio, the other a quarto. The first is written on three hundred and eighty-two double pages of vellum, in one and the same hand, in a small but plain character, each page having a double column; it contains thirty-one counties. The second volume, in 4to., is written upon four hundred and fifty double pages of vellum, but in a single column, and in a large fair character, and contains the counties of Essex, Norfolk, and Suffolk.

These two volumes are preserved, among other records of the Exchequer, in the Chapter House at Westminster: and at the end of the second is the following memorial, in capital letters, of the time of its completion: 'Anno Millesimo Octogesimo Sexto ab Incarnatione Domini, vigesimo vero regni Willielmi, facta est ista Descriptio, non solum per hos tres Comitatus, sed etiam per alios.' From internal evidence there can be no doubt but that the same year, 1086, is assignable as the date of the first volume.

In 1783 the whole was published under the editorial care of Mr. Abraham Farley. It was printed in fac-simile, as far as regular types, assisted by the representation of particular contractions, could imitate the original.

In 1816 the commissioners upon the Public Records published two volumes supplementary to Domesday, which now form one set with the volumes of the Record: one of these contains a general introduction, accompanied with two different indexes of the names of places, an alphabetical index of the tenants in capite, and an 'Index Rerum.' The other contains four records; three of them, namely, the Exon Domesday, the Inquisitio Eliensis, and the Liber Winton., contemporary with the Survey; the other record, called 'Boldon Book,' is the Survey of Durham, made in 1183, by Bishop Hugh Pudsey. These supplementary volumes were published under the superintendence of Sir Henry Ellis.

Northumberland, Cumberland, Westmorland, and Durham were not included in the counties described in the Great Domesday; nor does Lancashire appear under its proper name; but Furness, and the northern part of that county, as well as the south of Westmorland and part of Cumberland, are included within the West Riding of Yorkshire: that part of Lancashire which lies between the rivers Ribble and Mersey, and which at the time of the Survey comprehended six hundreds and a hundred and eighty-eight manors, is subjoined to Cheshire. Part of Rutlandshire is described in the counties of Northampton and Lincoln; and the two ancient hundreds of Atiscross and Existan, deemed a part of Cheshire in the Survey, have been since transferred to the counties of Flint and Denbigh. In the account of Gloucestershire we find a considerable portion of Monmouthshire included, seemingly all between the rivers Wye and Usk. Kelham thinks it probable that the king's commissioners might find it impossible to take any exact survey of the three counties northernmost of all, as they had suffered so much from the Conqueror's vengeance. As to Durham he adds, all the country between the Tees and Tyne had been conferred by Alfred on the bishop of this see, and at the coming in of the Conqueror he was reputed a count-palatine.

The order generally observed in writing the Survey was to set down in the first place at the head of every county (except Chester and Rutland) the king's name, *Rex Willielmus*, and then a list of the bishops, religious houses, churches, any great men, according to their rank, who held of the king in capite in that county, likewise of his thains, ministers, and servants; with a numerical figure in red ink before them, for the better finding them in the book. In some counties the cities and capital boroughs are taken notice of before the list of the great tenants is entered, with the particular laws or customs which prevailed in each of them; and in others they are inserted promiscuously. After the list of the tenants, the manors and possessions themselves which belong to the king, and also to each owner throughout the whole county, whether they lie in the same or different hundreds, are collected together and minutely noted, with their under tenants. The king's demesnes, under the title of *Terra Regis*, always stand first.

The two most important works for the student of the Domesday Survey are Kelham's 'Domesday

Book Illustrated,' 8vo., London, 1788, and the 'General Introduction' to the Survey, reprinted by command of his Majesty under the direction of the Commissioners on the Public Records, 2 vols. 8vo., 1833, accompanied by fresh indexes. A translation of the whole, under the title of 'Dom-Boc,' was undertaken early in the present century by the Rev. William Bawdwen, Vicar of Hooton Pagnell, in Yorkshire, who published Yorkshire, with the counties of Derby, Nottingham, Rutland, and Lincoln, in 4to., Doncaster, 1809, followed by the counties of Middlesex, Hertford, Buckingham, Oxford, and Gloucester, 4to., Doncaster, 1812; but the work went no further. County portions of this record will be found translated in most of our provincial histories. There are numerous other publications incidentally illustrative of Domesday topography, which the reader must seek for according to the county as to which he may desire information.

DOMFRONT. [ORNE.]

DOMICILE. In the Roman law Domicile (*Domicilium*) was defined to be that place which a person 'makes his family residence, and principal place of business; from which he does not depart unless some business requires: when he leaves it he considers himself a wanderer, and when he returns to it, he deems himself no longer abroad.' ('Cod.' 10, tit. 40 (39), 1, &c.)

The constitution of domicile depends on the concurrence of two elements—1st, residence in a place; and 2nd, the intention of the party to make that place his home. Residence is generally, though not always, a fact of a simple kind; but the intention of the party must often be deduced from many circumstances.

The following rules appear to comprise the generally adopted principles on the subject:—

1. The domicile of the parents is the domicile of the child. This is generally called the domicile of origin, and is often the same with the place of birth, unless the parent should change his domicile during the child's minority. An illegitimate child follows the domicile of his mother.

2. Minors are generally considered incapable of changing, by their own act, the domicile of origin during their minority. If the father change his domicile, that of the children follows it; and if he dies, his last domicile will be that of his infant children.

3. A married woman follows the domicile of her husband.

4. A widow retains the domicile of her late husband till she acquires another.

5. The domicile of origin must be considered to prevail till the party has not only acquired another, but manifested and carried into effect an intention of abandoning his former domicile and abiding by another as his sole domicile.

6. An acquired domicile is not lost by mere abandonment, but continues until a subsequent domicile is acquired, which can be done only by residence and intention.

7. A married man's domicile is generally to be taken to be where the residence of his family is.

8. If a man, whether married or not, has two places of residence at different times of the year, that will be esteemed his domicile which he himself selects, describes, or deems to be his home, or which appears to be the centre of his affairs; that of a nobleman or country gentleman, his residence in the country—that of a merchant, his residence in town.

9. Residence in a place, to produce a change of domicile, must be voluntary. Also a person abroad in the service of the state does not change his domicile. But it has been held that a Scotchman entering the service of the East India Company acquires a domicile in India, which (like a domicile acquired in any of the colonies) is in legal effect the same as a domicile in England.

Thus it appears that domicile is of three kinds —1st, domicile of origin, depending on that of the parents at the time of birth; 2nd, domicile of choice, which is voluntarily acquired by the party; and, 3rd, domicile by operation of law, as that of a wife, arising from marriage.

The determination of a person's domicile is often a question of great practical importance.

When a man dies, his personal property must be distributed according to the law of the country in which he was domiciled at the time of his death. In England every person, whether native or foreigner, who is for the time being within England, is amenable to the jurisdiction of its civil courts, and may sue or be sued in them. In Scotland, when the subject of dispute is within the jurisdiction of the courts, an action regarding it may proceed there, and any one who has property within their jurisdiction may be made amenable to the extent of that property. But actions of personal status, as for divorce, establishing a marriage, &c., can only proceed when the parties have established a domicile there by residence for forty days.

(Story's *Commentaries on the Conflict of Laws*, c. iii; R. Phillimore, *On Domicile*, 1847.)

DOMINANT, in music, the 5th of the key. Thus, if the key be C, the dominant is G.

DOMINGO, ST. [HISPANIOLA.]

DOMINIC, ST., DOMINICANS. [BLACK FRIARS.]

DOMINI'CA, one of the English Antilles, lies betwen the French islands of Martinique and Guadaloupe; the parallel of 15° 18′ N. lat., and the meridian of 61° 28′ W. long., pass through the island. It is 28 miles long and 16 miles broad at the widest part, but its mean breadth is not more than 9 miles. The area is 277 square miles. The population, according to the census taken in June, 1844, was 22,469, above 19,000 of whom are Roman Catholics. The surface is mountainous; Morne Diablotin, the highest summit, is 5130 feet above the sea. The valleys are very fertile, and well watered. About the centre of the island, on the top of a high mountain, is a fresh-water lake, with an area of several acres, which in some parts has not been fathomed. The island contains an abundance of large timber-trees. Fresh-water-fish and sea-fish are plentiful. The chief products of *Dominica* are sugar, rum, and coffee. The principal town, Roseau, stands on a tongue of land on the south-west side of the island. It is regularly built, with long and wide paved streets, which cross each

other at right angles. It has an arsenal, a harbour, which however is greatly exposed, and 3954 inhabitants. Prince Rupert's Bay, on the north-west side of the island, is at all times safe and commodious. [ANTILLES; WEST INDIES.]

DOMINICAL LETTER (*dies dominica*, Sunday). To every day in the year is attached one of the first seven letters, A, B, C, D, E, F, G; namely, A to the first of January, B to the second, &c.; A again to the eighth of January, and so on. The consequence is, that all days which have the same letter fall on the same day of the week. The *dominical letter* for any year is the letter on which all the Sundays fall. Thus, the first of January, 1837, being Sunday, the dominical letter for 1837 is A. In a common year, the first and last days have the same letters, whence the dominical letter of the succeeding year is one earlier in the list; that is, the domincial letter for 1838 is G. But in leap-year, it is to be remembered that the 29th of February has no letter attached to it: whence every leap-year has two dominical letters, the first for January and February, the second for all the rest of the year, the second being one earlier than the first. The following will now be easily understood; each year is followed by its dominical letter, 1837, A; 1838, G; 1839, F; 1840, E, D; 1841, C; 1842, B; 1843, A; 1844, G, F, &c.

As it is convenient in historical reading to be able to find the day of the week on which a given day in a distant year fell, we subjoin the following rules for finding the dominical letter.

Old Style. Add the given year to the quotient of its division by four, and to four: find the remainder of the sum divided by seven. The dominical letter (the second letter, if it be leap-year) is written under that remainder in

6	5	4	3	2	1	0
A	B	C	D	E	F	G

New Style. Add one more than the given year to the quotient of the division of the given year by four, and (if there be such a thing) to the quotient to four of the excess of the centurial figures above 16: then subtract that excess. With the remainder to seven, proceed as before.

The following are examples:—

O. S.	N. S.	N. S.
1032	1848	4610
1032	1849	4611
258	462	1152
4	0	7
7)1294	2311	5770
Rem. 6	2	30
2nd. Letter A	7)2309	7)5740
	Rem. 6	Rem. 0
	2nd. Letter A.	Letter G.

DO'MINIS, DE, MARCUS ANTONIUS, an Italian theologian and natural philosopher, was born, in 1566, of an ancient family, at Arba, on the coast of Dalmatia; and, having been educated in a college of the Jesuits at Loretto, he completed his studies at the university of Padua.

While passing his novitiate preparatory to entering the order of Jesuits, he gave instruction in mathematics, physics, and eloquence. At the same time he employed his leisure in the study of theology; and it was then that he composed his work entitled 'De Radiis Visus et Lucis in Vitris Perspectivis et Iride,' which was published at Venice by one of his pupils, in 1611.

On the recommendation of the emperor Rodolphus, De Dominis was appointed bishop of Segni, and two years afterwards archbishop of Spalatro; but, while holding this dignity, he became embroiled with the pope (Paul V.) by taking a part in the disputes between that pontiff and the Venetians respecting the endowment of ecclesiastical establishments. Being suspected of an inclination in favour of the reformed religion, he found it convenient to consult his safety by resigning his archbishopric, and retiring to Venice: this was in the year 1615, and in the following year he came to England, where he experienced a favourable reception from James I. The king appointed him to the deanery of Windsor; and at this time he composed his work entitled 'De Republicâ Ecclesiastica,' the object of which is to show that the pope had no supremacy over other bishops.

De Dominis appears to have been restless and inconstant; for, after a few years, he expressed a wish to return to the bosom of the Catholic church; and having received from the pope (Gregory XV.) a promise of pardon, he set out for Rome. Soon after his arrival, some intercepted letters gave indications that his repentance was not sincere; and he was, in consequence, committed to the castle of St. Angelo, where, after an imprisonment of a few months, he died, Sept. 1624. Being convicted after his death of heresy, his body was disinterred and burnt.

De Dominis has the merit of being the first who assumed that the rainbow was produced by two refractions of light in each drop of rain with an intermediate reflection from the back part of the drop. He knew nothing however of the different refrangibilities of the rays of light; and he conceived that the colours were produced by the different forces with which the rays strike the eye in consequence of the different lengths of path described within the drop.

DOMITIA'NUS, TITUS FLAVIUS, *younger* son of the Emperor Vespasianus, succeeded his brother Titus as emperor, A.D. 81. Tacitus ('Histor.,' iv., 51, 68) gives an unfavourable account of his previous youth. In the beginning of his reign he affected great zeal for the reformation of public morals. He also forbade under severe penalties the practice of emasculation. He completed several splendid buildings begun by Titus; among others, an Odeum, or theatre for musical performances. The most important event of his reign was the conquest of Britain by Agricola. [AGRICOLA.] Domitian's true character soon displayed itself in his avarice and cruelty. His cruelty was united to a deep dissimulation. He either put to death or drove away from Rome the philosophers and men of letters; Epictetus was one of the exiled. He found, however, some flatterers among the poets, such as Martial, Silius Italicus, and Statius. The reign of Domitian was anything but favourable to the Roman arms, except

in Britain. In Mœsia and Dacia, in Germany and Pannonia, the armies were defeated, and whole provinces lost. Domitian himself went twice into Mœsia to oppose the Dacians, but after several defeats he concluded a disgraceful peace with their chief Decébalus; and yet Domitian made a pompous report of his victories to the senate, and assumed the honour of a triumph. In A.D. 93 a persecution of the Christians is recorded in the history of the church, but it seems that it was not directed particularly against them, but against the Jews, with whom the Christians were then confounded by the Romans. In A.D. 96, a conspiracy was formed against Domitian among the officers of his guards and several of his intimate friends, and his wife is said to have participated in it. He was killed in his apartment by several of the conspirators. On the news of his death, the senate assembled, and elected M. Cocceius Nerva emperor.

Coin of Domitianus.
British Museum. Actual Size. Copper.

Reverse.

The character of Domitian is represented by all ancient historians in the darkest colours. At one time, before his becoming emperor, he had applied himself to literature and poetry, and he is said to have composed several poems and other works.

(Tacitus, *Agricola;* Suetonius, *Domitianus;* Dion Cassius, lib. 67.)

DON, the ancient *Tánais* and the Tartar *Tuna*, a river of European Russia, rises in the small lake Ivanofskoe, in the government of Tula, and thence flows in a general S.S.E. direction, through the governments of Ryazan, Don-Cossacks, Tambof, and Voronesh, to the town of Paulovsk, receiving within these limits the Sosva, the Voronesh, and the Sosna. Below Paulovsk it runs east through the territory of the Don Cossacks to within about 35 miles of the Volga. Repulsed by the mountainous region on the west bank of the Volga, it then proceeds in a south-western direction to the sea of Azof, which it enters by three mouths, having received in this part of its course, from the right bank the Donetz, the most considerable of its tributaries, and from the left bank the Medvieditza, the Manitsh, and the Sal, both the last of which flow from Caucasian mountains. The length of its course is estimated at about 880 miles. The width varies from 350 to 1200 feet. This river has a slow current, and abounds in shallows and sand-banks, but has neither falls nor whirlpools. In spring it overflows its banks, and forms broad and unwholesome swamps; it is navigable as high as Zadonsk on the north-western border of Voronesh, and has depth of water enough from the middle of April to the end of June for large vessels, but is so shallow during the remainder of the year, that there is scarcely two feet of water above the sand-banks. Its mouths are so much choked with sand as to be unnavigable for any but flat boats. The waters of the Don abound in fish. A canal projected by Peter the Great, and partly executed, is intended to join the Don and the Volga. It commences a little N. of 50° N. lat., in the Illavlia, which enters the Don near its most eastern point, and is to terminate in the Kamychenka, a feeder of the Volga, the whole length, including the canalization of the two rivers, being about 90 miles.

DON-COSSACKS, TERRITORY OF THE, is a country which acknowledges the Russian sovereign as its chief, but is not reduced to the condition of a province of the empire. It lies between 47° and 51° 11′ N. lat., 37° 20′ and 44° 45′ E. long.; and is bounded N. by the provinces of Voronesh and Saratof, E. by Astrakhan, S. by Caucasia and the sea of Azof, and W. by Ekaterinoslaf and Voronesh. Its area is stated to be 62,000 square miles, and the population in 1846 amounted to 704,300.

The general character of the country is that of a plain, in many parts consisting entirely of steppes. The interior is a complete flat, but in the north and along the banks of the Don there are slight elevations, and the south-eastern parts are traversed by low offsets of the Caucasian mountains. The rest of the country is a broad steppe, which contains abundance of luxuriant pasturage, intermixed with tracts of sand. The whole territory does not contain a single forest, and even brushwood is only occasionally found. The steppes are full of low artificial mounds and ancient tumuli, supposed from the features and head-dress of the rude stone images erected over some of them to be of Mongolian origin. Many of these tombs have been opened, and found to contain gold and silver urns, rings, buckles, &c.

The chief rivers are the Don and its tributaries [DON], and some smaller streams that flow directly S. from the steppes into the sea of Azof; the principal of these is the Moloschna. The principal lake is the Bolskoi, which is about 70 miles long and 9 broad; it is traversed by the Manitsh, and forms part of the boundary between the territory of the Don-Cossacks and Caucasia.

The country enjoys a mild climate. The spring sets in early, and in summer the land is refreshed

by frequent showers; the autumn is at times damp and foggy, and the winter, though clear, is severe and attended by much stormy weather. The rivers are ice-bound from November to February.

All the north and east of the country is inhabited by the Don-Cossacks, and hordes of Calmuck and Nogay Tartars, who until lately led the roving life of nomads. The western district, lying between the Donetz, the Don, and Ekaterinoslav, is inhabited by German colonists, principally Mennonites from Prussia, and is one of the most prosperous and best cultivated portions of Russia. The Nogays also have been compelled to settle in villages, and devote themselves to agriculture, the processes of which, as well as of other common industrial arts, they have readily learnt from their German neighbours. The Don-Cossacks have always been in some degree agriculturists, but chiefly cattle-breeders; and indeed these are the principal occupations of the three great divisions of the population. Vast quantities of wheat, the most important article of cultivation, are produced, and large exports are made by the ports of the sea of Azof. After wheat, merino wool is the most important produce of the steppes. The Mennonites possess immense flocks of sheep, but the wool is far from being so valuable now as it was formerly. Barley, oats, maize, and buckwheat are also raised, as well as peas, beans, flax, and hemp. The vine is cultivated to a considerable extent, and wine of a good quality to the amount of 100,000*l.* a year finds its way to Moscow and other towns in the interior. The Mennonites are allowed to distil brandy for their own use, which is a great favour in Russia, where the distillation of spirits is a monopoly of the crown. They are also exempt from military service, and appoint their own judges. The settlements of this people are on the left bank of the Moloschna, the right bank of which is occupied by German Lutherans, from Würtemberg, Baden, and Switzerland, but these do not enjoy the same privileges as the Mennonites. Horses are very numerous. The native Cossack horse is small and spare in flesh, with a thin neck and narrow croup; he is, on the whole, an ill-looking animal, but strong, fleet, and hardy. The poorer Cossacks have each three or four horses, but many of the Tabunes, or herds, of the wealthier breeders, contain 1000 or more. All, with the exception of the saddle-horses, are kept on the pasture-grounds throughout the year, and in winter are forced to seek for their food either beneath the snow or from the high reeds on the banks of rivers. Dromedaries are reared by the Calmucks, and thrive well on the saline plants of the steppes. The ox is used for draught; goats are bred principally by the Calmucks, and are used as leaders to the sheep over the steppes. Fish in large quantities are taken in the Don and its tributaries and along the shores of the sea of Azof. Honey and wax to the amount of 300,000 lbs. are annually produced. The exports consist of horses, cattle, fish, tallow, hides, and skins, the agricultural produce named above, and also of caviar and isinglass. Salt is gathered in summer from the evaporated lagunes along the sea.

The chief towns are—*Old Tscherkask*, which stands on an island formed by a branch of the Don called Aksai, in 47° 27′ N. lat., 39° 58′ E. long., and has 15,000 inhabitants, chiefly Cossacks. Owing to the inundations of the Don, and the unhealthiness of the site, it was resolved in 1804 to remove to a healthier spot about four miles distant, on which New Tscherkask now stands; but the Cossacks are said still to be attached to the old site. *New Tscherkask*, which in 1840 contained about 2000 houses and 11,327 inhabitants, is well laid out with broad regular streets; the houses are only one story high, most of them of wood. This town is the seat of the government offices, and the residence of the Ataman or Hetman of the Cossacks. It has a gymnasium and 8 churches, several schools and hospitals. *Perdjausk*, on the sea of Azof, is a still more modern town; it stands on the Moloschna in the district of the Mennonites, and has a population of about 3000, composed of Italians, Russians, and Greeks. Its port is better than that of Taganrog. The inhabitants are chiefly engaged in the corn trade.

The history and government of the Don-Cossacks are given under the article Cossacks.

DON, DAVID, was born at Forfar in Scotland, in 1800. His father was proprietor of a nursery and botanic garden in this place, and is well-known as having been an acute practical botanist, and one who cultivated the botany of his native country with great success.

One of Don's earliest publications was the description of a number of species of plants which were either entirely new, or had only been found in a few localities where they had been collected by his father and others in Scotland. It was entitled 'Descriptions of several New or Rare Native Plants, found in Scotland chiefly by the late Mr. George Don of Forfar.' It was published in the third volume of the Memoirs of the Wernerian Society of Edinburgh. This work was a valuable contribution to our native botany. He shortly after published in the thirteenth volume of the Transactions of the Linnæan Society 'A Monograph of the genus Saxifraga.' He was subsequently appointed librarian to the Linnæan Society.

On the death of Professor Burnett, in 1836, he was appointed to the chair of botany at King's College, London, a position which he held till his decease. As a teacher he was much beloved by his pupils: time was never made an object when he had the advantage of his class in view. The same urbanity of manner and liberality in imparting all he knew distinguished him in his position at the Linnæan Society. As a lecturer however he failed in expressing himself with perspicuity and facility.

His numerous works are sufficient proof of his industry, and they have a real value. Don's knowledge of plants was most extensive, and his appreciation of species ready and exact. He was not however fully alive to the importance of studying plants in their morphological relations, and many of his papers are open to criticism on this ground. His constitution was robust and strong, but at the end of 1840 a malignant tumour appeared on his lip, which, although removed at

first, speedily reappeared, and terminated his existence on the 8th of December of the same year.

DONAGHADEE. [DOWN.]

DONATELLO. *Donato di Belto di Bardo*, called *Donatello*, was born at Florence in 1383. He received his first instruction from Lorenzo Bicci, from whom he learned painting in fresco; but he afterwards became more famous as a sculptor. He also practised architecture. In the course of his life he visited many towns of Italy, among which were Venice and Padua, where the people wanted to detain and naturalise him, and Rome. Donatello was much esteemed by his contemporaries, and executed a great number of works, both in private and public buildings, and for the grand-duke Cosmo I. He was the first to employ bas-relief in telling stories, according to the more elaborate style of Italian sculpture. He died paralytic, December 13, 1466.

His principal works are at Florence. One, a figure of St. Mark, which was nicknamed Lo Zuccone (the Gourd) on account of its bald head, is much commended. A St. George is also much esteemed; and Vasari, speaking of a Judith bearing the head of Holofernes, in bronze, calls it a work of great excellence and mastery.

DONA'TIO MORTIS CAUSA, a gift made in prospect of death. The doctrine is derived from the Roman law, and a donation of this kind is defined in the Institutes (ii. tit. 7) as 'a gift which is made under an apprehension of death, as when a thing is given upon condition that, if the donor die, the donee shall have it, but that the thing given shall be returned if the donor shall survive the danger which he apprehends, or shall repent that he has made the gift; or if the donee shall die before the donor.' The definition of a 'donatio mortis causâ' in Fleta (ii. 57, 'De Testamentis') agrees almost word for word with that of Ulpian ('*Dig.*' 39, tit. 6, s. 2). Fleta's definition is perhaps taken from Bracton (ii. 26), who has adopted the words of Ulpian. In the English law it is necessary to the validity of this gift that it be made by the donor with relation to his dying by the illness which affects him at the time of the gift, but it takes effect only in case he die of that illness. There must be a delivery of the thing itself to the donee; but in cases where actual transfer is impossible, as, for instance, goods of bulk deposited in a warehouse, the delivery of the key of the warehouse is effectual. A donatio mortis causâ partakes of the nature of a legacy so far as to be liable to the debts of the donor, and, by 36 Geo. III. c. 53, s. 7, to the legacy duty; but as it takes effect from the delivery, and not by a testamentary act, neither probate nor administration is necessary, nor the assent of the executors, as in the case of a legacy.

The English law of Donations 'mortis causa,' is explained in Roper 'On Legacies.' See also Edwards *v.* Jones, 1 M. & C. 226; Duffield *v.* Elwes, 1 S. & S. 239.

DONATISTS, Christian schismatics of Africa, originally partisans of Donatus, bishop of Casa Nigra in Numidia, who, about the year 312, taught that baptism administered by heretics was ineffectual; that the church was not infallible; that it erred in his time; and that he was to be the restorer of it. After many ineffectual efforts to crush this schism, the emperor Honorius assembled a council at Carthage, in the year 410, which decided against them, after a disputation between seven of each party, in which St. Augustine, bishop of Hippo, was their chief antagonist. The Donatists however continued as a separate body, even in the 6th century, but they gradually dwindled, and became quite extinct in the 7th century. (Broughton's *Dictionary of all Religions;* Mosheim's *Ecclesiastical History.*)

DONATIVE. [BENEFICE.]

DONA'TUS, ÆLIUS, a grammarian, who lived in the middle of the fourth century. He wrote a Grammar, which was long used in the schools; and also notes upon Terence and Virgil. He was most eminent in the time of Constantius, and taught rhetoric and polite literature at Rome in the year 356, about which time St. Jerome studied grammar under him. The 'Commentarii in quinque Comœdias Terentii,' were first printed without date, probably before 1460, and reprinted in 1471 and 1476. The 'Commentarius in Virgilium,' fol., Ven., 1529, though ascribed to him, is thought by many not to be his.

DONCASTER. [YORKSHIRE.]

DONCHARY. [ARDENNES.]

DONEAU, Latinized DONELLUS, HUGUES, a lawyer, was born at Châlons-sur-Saône, in France, in 1527. He studied literature at Tournon and jurisprudence at Toulouse, and subsequently at Bourges, where he took a degree as Doctor of Laws in 1551. He soon afterwards taught jurisprudence at Bourges, and continued to do so till the massacre of St. Bartholomew in 1572. He had embraced the opinions of the Huguenots, and, dreading to be involved in ruin with others of his persuasion, he made his escape to Geneva. After having remained a short time in Geneva, he was called by the calvinist Elector Palatine Frederic III. to be Professor of Law at Heidelberg. Ludwig IV., the successor of this prince, who did not follow his religious opinions, made changes in the university which drove Doneau thence. He left Heidelberg in 1579, and settled in Leyden, but afterwards returned to Germany. He died at Altorf on the 4th of May, 1591. He was a voluminous commentator. His earliest work appears to have been 'In Titulum de Usuris in Pandectis Commentarius,' Paris, 1556. A collection of his commentaries was published in five volumes, folio, at Frankfort, in 1596, and again in 1626. One of the most complete extant lists of Doneau's works is in the printed catalogue of law books in the Advocates' Library, Edinburgh.

DONEGAL, a county of Ireland, in the province of Ulster, is bounded E. and S. by parts of the counties of Londonderry, Tyrone, Fermanagh, and Leitrim; and S.W., W., and N. by the Atlantic Ocean. The greatest length, N.E. and S.W., is 85 miles; the greatest breadth, S.E. and N.W., is 41 miles. The area is 1865 square miles, or 1,193,443 acres, of which 393,191 are arable, 769,587 uncultivated, 7079 in plantations, 479 in towns, and 23,107 under water. In 1847 the following was the land under crops:—Corn and

Beans, 128,359 acres; Potatoes, 10,983; Turnips, 15,588; Flax, 10,973; Meadow and Clover, 33,990; other crops, 2995.—Total under crop, 202,888 acres. The population in 1841 was 296,448, of whom 290,021 were in the rural district, and 6426 in the civic district. Donegal forms the north-western extremity of Ireland. The inland boundary preserves a general direction of south-west by north-east, and from Lifford northward is formed by the river Foyle and the harbour of Loch Foyle. The maritime boundary is extremely irregular, being deeply indented on the north by the æstuaries of Loch Swilly, Mulroy, and Sheephaven, and on the south by Donegal Bay. The whole county is uneven and mountainous, with very few exceptions. The mountain groups of Donegal, together with the highlands of Tyrone and Derry, present a deeply withdrawn amphitheatre to the north-east, inclosing the basin of the Foyle. These mountains include eight summits varying from 1200 to 2500 feet in height. The coast of Loch Foyle between the mountains of Inishowen and the sea, is well inhabited and improved. Loch Swilly extends inland upwards of 20 miles, and forms a spacious and secure harbour; but the vicinity of Loch Foyle, which floats vessels of 900 tons up to the bridge of Derry, renders Loch Swilly of less importance as a harbour. In the sound between Horn Head and Bloody Foreland are the islands of Innisboffin, Innishdoony, and Tory Island, which last is at a distance of eight miles from the shore, and is inhabited by a primitive race who seldom visit the mainland of Ireland. From Bloody Foreland southward, the Atlantic coast of the county is extremely dreary, exhibiting moors, sand-banks, and pools of bog-water. There are many islands near the shore, of which the chief are—Aranmore, Innismacdurn, Innisfree, and Owney. The desolate district called the Rosses is separated by the river Gweebarra from a more reclaimed country about Glentics and Ardara. Near Malin Beg Head, at the western extremity of Donegal Bay, is a sea-cliff which rises to a perpendicular height of 1964 feet. Many of the adjoining cliffs are also very lofty and rugged. Donegal Bay contains many sheltered creeks and the good harbours of Donegal and Killybegs. North-eastward of the town of Donegal lies a good tract of arable land, stretching inland to Loch Eask and the Gap of Barnesmore.

The Foyle is not so much a river, as an æstuary for several rivers. It receives the waters of the Finn, the Derg, and the Deele; while Loch Swilly receives those of the Swilly, the Leannan, and the Lacknagh. Among the rivers of the western coast are the Gweebarra, the Gweedore, and the Owenea. There are many lakes in the county, of which the chief are the Loch Derg, Loch Deele, Loch Gartan, Loch Eask, Loch Salt, and Loch Glen. Some of these lakes, though small in area, are very deep.

The climate of Donegal is raw and boisterous, except in the sheltered country along the Foyle. The prevalent winds are from the west and north-west, and the violence with which they blow is sometimes excessive. From the remains of natural forests in many situations where no timber will at present rise against the north-west blast, it has been inferred that the climate is now more severe than it formerly was.

The geological formation of Donegal is mostly primitive. The prevalent rocks are granite and mica slate, passing into gneiss, quartz slate, and clay slate. The granite is a coarse granular syenite. Granular limestone is found in beds throughout the whole mountain district in great quantity and variety of colour. Siliciferous, magnesian, and marly limestone also occur in various parts of the baronies of Inishowen and Raphoe, with a remarkable steatite near Convoy, on the Deele, which cuts under the knife like wood, and is used by the country people for the bowls of tobacco-pipes. Beds of greenstone and greenstone-porphyry are sometimes found resting on the deposits of granular limestone. Among the rarer minerals occurring in this remarkable region are—columnar idocrase, malacolithe, epidote, essonite, garnet, plumbago, copper pyrites, lead earth, iron ochre, porcelain clay, potter's clay, iron pyrites, lead ore, and pipe-clay. The white marble of Dunlewy, near the mountain Erigal, is of an excellent quality, and the bed very extensive.

The soil of the primitive district is generally cold, moory, and thin. The limestone tract from Ballyshannon to Donegal is covered with a warm friable soil, varying from a deep rich mould to a light brown gravelly earth. The soil of the transition district, arising chiefly from the decomposition of slaty rock, is a light but manageable clay, which is very well adapted for crops of potatoes, flax, oats, and barley. The ordinary rotation of crops in the limestone district is potatoes, oats, or, on the sea-coast, barley, and flax; on the cold lands of the western coast, potatoes and barley; among the mountains, potatoes and oats. The loy, or one-sided spade, and the old wooden plough, are still in common use in the highland districts. Donegal is not a grazing county; the good land is almost all under tillage; and the grasses of the remainder are generally too sour for feeding.

The linen manufacture is carried on to a very considerable extent, especially about Raphoe and Lifford, and in the neighbourhood of Ballyshannon. Private or illicit distillation has required stringent measures for its suppression in the county. The chief exports are of corn, which is shipped at Londonderry and Letterkenny.

Divisions and Towns.—Donegal is divided into 6 baronies. It contains the diocese of Raphoe, now united with Derry, and parts of Derry and Clogher. The county returns 2 members to parliament. The assizes are held at Lifford.

The following are the principal towns, with the population of each in 1841:—

Ballyshannon, the most important town in Donegal, is situated at the head of a small inlet running into Donegal Bay, into which the Erne discharges its waters. This fine river flows through the town, and falls into the sea over a ledge of rocks ten feet above the level of ordinary tides. The town comprises three very steep streets and a wretched suburb, and has a church, a Roman Catholic chapel, a Presbyterian meeting-house, and

a Methodist meeting-house. The harbour is exposed to westerly winds, which, added to the difficulties of the bar, renders the export trade very trifling, and limits the business of the town almost entirely to the supply of the poor though extensive surrounding district; but there is a large salmon fishery. Population of the town, 3513.

Donegal is situated on a small shallow inlet of the Bay of Donegal, where it receives the waters of the Eask. The town and harbour are both small. Population of the town, 1366.

Letterkenny is situated on the sides of a steep hill, about a mile from the small harbour called the Port, at the head of the æstuary of the Swilly, up to which vessels of 150 tons burthen can sail, and by means of which a good trade is carried on. The town consists of a long straggling street, with some good shops, and supplies the neighbouring mountainous country. It has a church, a Roman Catholic chapel, and three Presbyterian meeting-houses. Population of the town, 2161.

Lifford, the assize town of Donegal, is a small and poor place on the west bank of the Foyle, and is, in fact, a suburb of Strabane, on the opposite bank of the river, in Tyrone. Population of the town of Lifford, 752.

History and Antiquities.—The southern part of Donegal was known as Tyrconnell, and was the patrimony of the O'Donnells, whose chief tributaries were the O'Boyles in Boylagh and the Rosses; the Mac Swines (Mac Suibhne) in Bannagh, Rossguill, and Fanad; and the O'Doghertys in Inishowen. The most distinguished of the chieftains of Tyrconnell was Hugh O'Donnell, who was engaged in active civil war against the government during the reign of Queen Elizabeth. These contests were continued in the early part of the 17th century; until at length, in 1608, Donegal, along with five other counties of Ulster, escheated to the crown, and was planted or granted as English and Scotch colonies. The political events of subsequent date have been few and unimportant.

The most remarkable piece of antiquity in Donegal is the Grianan of Aileach, the palace of the northern Irish kings from the most remote antiquity down to the twelfth century. It stands on a small mountain 802 feet in height, near the head of Loch Swilly. The summit of the mountain, which commands a noble prospect, is surrounded by three concentric ramparts of earth intermixed with uncemented stones. The approach by an ancient paved road leads through these by a hollow way to a dun or stone fortress in the centre. This part of the work consists of a circular wall of Cyclopean architecture, varying in breadth from 15 feet to 11 feet 6 inches, and at present about 6 feet high, inclosing an area of 77 feet 6 inches in diameter. The wall has galleries, terraces, and doorways cut in its thickness. The remains of a small oblong building of more recent date, but of uncertain origin, occupy the centre. The space contained within the outer inclosure is about 5½ acres, within the second, about 4; within the third, about 1; and within the central building, ¼. The stones of the wall are generally about 2 feet in length, polygonal, not laid in courses, nor chiselled, and without cement. On Tory Island are some Cyclopean remains, a round tower, and remains of two stone crosses, and of seven ancient churches. Throughout the county are numerous memorials of St. Columba, or, as he is more usually named in Ireland, St. Columbkille. Near Kilmacrenan is the rock of Doune, on which the O'Donnell was always inaugurated. The remains of the abbey of Donegal still possess interest for the antiquarian, and on the north of Glen Veagh are some very ancient remains of churches. But by much the most celebrated ecclesiastical locality in this county is the Purgatory of St. Patrick, situated on an island in Loch Derg; it consists of a cave and buildings, in which priests assist at a Roman Catholic festival, which brings thousands of pilgrims annually.

(*Statistical Survey of Donegal*, 1802; Otway's *Sketches in Ireland; Northern Tourist;* Inglis's *Ireland in* 1834; *Memoirs of Ordnance Survey of Ireland*, 1837; *Parliamentary Papers, &c.*)

DONELLUS. [DONEAU.]

DONGOLA. [NUBIA.]

DONNE, JOHN, was born in London, in the year 1573, of respectable parents. He distinguished himself at a very early age by his ready acquisition of learning, and was sent in succession to the Universities of Oxford and Cambridge, but took no degree, in consequence of the religious scruples of his family, who were Roman Catholics. At seventeen he entered Lincoln's Inn to study the law, and while there, on due reflection, became a Protestant. After travelling for about a year in Spain and Italy, he became, on his return, secretary to the Lord Chancellor Ellesmere, and fell in love with and married that nobleman's niece, the daughter of Sir George More. Sir George was very indignant, and not only refused to be reconciled for a long while, but took away his wife, whom Donne only recovered by an expensive law-process; and when he at length forgave the married pair, he still refused to assist them. At length Sir George was prevailed upon to allow a trifle for their support, but his circumstances still compelled Donne to accept of a residence in the house of Sir Robert Drury, in Drury Lane. He accompanied that gentleman to Paris, and on his return to England he was introduced to James I., and delighted the king by a polemic treatise against Catholicism, entitled 'Pseudo-Martyr,' published in 1610. James was so anxious that he should take holy orders, that Donne at length complied in 1613, and he became the king's chaplain-in-ordinary. The University of Cambridge made him doctor of divinity; and now, just as he was rising from his misfortunes, his happiness was embittered by the death of his beloved wife. The benchers of Lincoln's Inn presented him with their lectureship; and he became dean of St. Paul's and vicar of St. Dunstan's in 1621. His health soon failed him, but when almost in a dying state he preached what Walton has called his 'own funeral sermon.' This discourse was afterwards printed under the quaint title of 'Death's Duel.' From this time he abandoned all thoughts of life, and even had a portrait painted of himself, enveloped in a shroud, which he kept in his bed-room. He died March 31,

1631. To those who wish to see characters like Donne treated in the spirit of their own time, we cannot recommend a more delightful book than Walton's Life of Donne.

Donne, notwithstanding his quaint conceits, had a rich vein of poetry, which was rarely concealed even when most laboriously encumbered; while some of his pieces, both for thought and even melody, are absolute gems. His Satires, though written in a measure inconceivably harsh, are models of strength and energy. Their merits were discovered by Pope, who (to use his own odd phrase) translated them into English.

Donne's principal theological works, besides sermons, are the 'Pseudo-Martyr,' and a treatise against suicide, called 'Bia-Thanatos.'

DONOVAN, EDWARD, a writer on various departments of Natural History. One of his earliest publications was 'A Natural History of British Insects.' This work was commenced in 1792, and finished in 1816. The whole was comprised in sixteen volumes, 8vo. In 1794 he published a little work on the formation of museums of natural history, entitled 'Instructions for Collecting and Preserving various Subjects in Natural History,' 8vo., London. From 1794 to 1797 he published at intervals four volumes of a work containing drawings and descriptions of British Birds, entitled 'The Natural History of British Birds,' 8vo. In 1798 he commenced a series of illustrated works on the insects of Asia. These were called 'An Epitome of the Insects of China,' 1798, 4to., London; 'An Epitome of the Natural History of the Insects of India,' 1800, 4to., London; 'An Epitome of the Insects of Asia,' 1798 1805, 4to., London, 3 vols. In 1805 he published a work entitled 'Descriptive Excursions through South Wales and Monmouthshire in the year 1804 and four preceding Summers,' London, 2 vols. 8vo. In 1823 he commenced a periodical work entitled 'The Naturalist's Repository, or Monthly Miscellany of Exotic Natural History.' Of this work three volumes appeared containing descriptions and drawings of various animals from different parts of the world. He also published 'An Essay on the Minute Parts of Plants in general.' He died February 1, 1837.

DONZENAC. [CORRE'ZE.]

DONZY. [NIE'VRE.]

DOOM or DOUM, a remarkable palm-tree exclusively inhabiting Upper Egypt, especially the neighbourhood of Thebes, whence it is named *Cucifera Thebaica*. Clumps of it occur near Thebes. The fruit is about the size of an orange, angular, irregularly formed, of a reddish colour, and has a spongy, tasteless, but nutritious rind. The albumen of the seed is hard and semitransparent, and is turned into beads and other little ornaments.

DOOR and DOORWAY, the entrance leading into a public or private edifice, and the opening or entrance way into an apartment, or from one apartment to another. This way is closed with the door, which is generally made of wood, and hung to one of the sides or jambs of the doorway. For the general nature of doors in Grecian and Roman architecture, see CIVIL ARCHITECTURE (col. 612); for their peculiarities in gothic buildings, see GOTHIC ARCHITECTURE; and for the construction of the modern panelled door, the article JOINERY.

DOORNIK. [TOURNAY.]

DOPPELMAYER, JOHANN GABRIEL, a German mathematician, born at Nürnberg in 1671, was the son of a trader in that city, who had distinguished himself by his taste for physics, and is said to have made some improvements in the air-pump.

He was sent for instruction to Altorf, and he completed his education at the university of Halle: here he applied himself to the study of the law; but, abandoning this pursuit, he cultivated with diligence the different branches of natural philosophy. In the year 1700 he made a journey to Basel; from whence he proceeded to Holland, and he subsequently made a visit to England. After an absence of two years he returned to Nürnberg, where, in 1704, he was appointed professor of mathematics and astronomy; and this post he held during the remainder of his life. In December 1733, he was admitted a fellow of the Royal Society of London; and in 1740, a member of the Academies of Sciences at St. Petersburg and Berlin. He died December 1, 1750.

The principal works of Doppelmayer are—'Notices of the Mathematicians and Artists of Nürnberg,' in German (1730), and one entitled 'Neuentdeckte Phænomena von Bewundernswürdigen Würckungen der Natur, bey der fast allen Cörpern zukommenden electrischen Kraft in einem Systemati vorstellig gemacht,' 4to., Nürnberg, 1774.

DORA'DO (constellation), the Sword-fish, a constellation of Bayer, situated in the southern hemisphere, and cut nearly in half by a line cining α Argus and α Eridani.

DORAT, CLAUDE JOSEPH, was born at Paris, in 1734. He devoted himself to poetry, and produced a number of tragedies, which were much ridiculed, but he attained some reputation as a writer of the lighter class of poems. He died in the year 1780.

The works of Dorat fill twenty volumes, but they are not highly estimated. They are ornamented with engravings, superior to most of the time, upon which he expended the greater part of his property. His lighter tales in verse are told with naïveté and humour; his dramas are entirely forgotten.

DORCHESTER. [DORSETSHIRE.]

DORDOGNE, a department in the south of France formed out of the old province of Périgord and small portions of those of Limousin, Angoumois, and Saintonge, is bounded W. by the departments of Gironde, Charente-Inférieure, and Charente, S. by Lot-et-Garonne, S.E. and E. by the departments of Lot and Corrèze, and N. by Haute-Vienne. It extends from 44° 35′ to 45° 48′ N. lat., and from 1° 28′ E. to 0° 2′ W. long. Its length from N. to S. is 77 miles, from E. to W. 69. The area of this department, the second in extent in France, is 3534 square miles, and the population in 1841 was 490,263, which gives

138.73 to the square mile, or 29.27 below the average per square mile for all France.

The department belongs almost wholly to the basin of the Dordogne. Two mountain torrents, the Dor and the Dogne, springing from the gorges of the Mont-d'Or, in Puy-de-Dôme, unite near the village of Bains their waters and names to form the Dordogne, which from this point flows first N. and then W. for a few miles, till it reaches the western border of the department of Puy-de-Dôme. Here turning nearly due S. it separates for many miles the departments of Puy-de-Dôme from Corrèze, and this from Cantal, receiving on either bank numerous streams from the offshoots of the Auvergne mountains. [CANTAL; CORRE'ZE.] Crossing in a general south-west direction the south-eastern angle of Corrèze and the north of Lot, it gains the eastern border of the department of Dordogne, a little below Souillac, whence it runs almost due west to its junction with the Garonne near Bourg, in the department of Gironde. The whole length of this river is 250 miles, 182 of which are navigable; vessels of 300 tons go up as far as Libourne. The Dordogne is subject to the phenomenon called the Bore. [BORE; GIRONDE.] Its principal feeders in the lower part of its course are—the Vezère [CORRE'ZE]; the Isle, which flows S. from Haute-Vienne as far as Périgueux, whence it turns nearly due W. to Coutras; here it is joined on the right bank by the Dronne, which rises also in Haute-Vienne, and drains the north-west of the department; a little below Coutras the Isle runs S., and enters the Dordogne at Libourne in the department of Gironde, after a course of 124 miles, being navigable from Périgueux. The northern angle of the department belongs to the basin of the Charente, and is drained by the Bandiat. [CHARENTE.] A narrow strip on the southern border is drained by the Dropt, a feeder of the Garonne. Besides these there are a great number of smaller streams, several lakes, and excellent springs. In all the waters of the department, pike, trout, and eels abound. Some of the springs form jets, and others have a regular ebb and flow.

The surface is hilly; the last western slopes of the Auvergne mountains cover the greater part of it. The ranges N. of the Dordogne springing from the Limousin run generally towards the S.W.; those S. of that river spring from the mountain masses of Cantal, and run nearly due W. The hills are generally overgrown with woods, broom, or heath; but in many places they are bare, rocky, and very steep. The valleys of the department are long, narrow, and winding; some of them of great beauty and fertility, the slopes of the hills that close them in being generally covered with vineyards; this is especially the case with the valleys of the Isle and the Dordogne. The general character of the soil of the uplands is barrenness. The northern portion, which forms the arrondissement of Nontron, consists almost entirely of high forest land and irreclaimable moors, the only cover of which is broom and underwood; the only exception is some good grass land between the Bandiat and the Tardoire. In the more central part, which constitutes the arrondissement of Périgueux, though the hills are not so high, the soil is similar, forests and moors covering two-thirds of the surface. Rye and buckwheat are almost the only cereals grown in these districts. The deficiency of corn is supplied by the immense produce of chestnuts, which are used as human food, and also for fattening hogs, a source of great profit to the farmer. The highest land in the department is in the arrondissement of Sarlat, the hills rising to the height of 700 to 800 feet, with sides in some places perpendicular. About Bergerac the hills having subsided, the valley of the Dordogne opens out into an extensive plain, and here maize, wheat, peas, beans, and other farm produce, are abundantly raised. Of the arrondissement of Ribérac, which is watered by the Dronne, about one-third consists of rich heavy wheat land, and the remainder of arid gravelly soil, or hungry barren sand. The vines in this district are trained to creep along the branches of elms and walnut trees, which present a beautiful appearance in the autumn, bending with the weight of the ripe grape-clusters; but by this method, though more grapes are produced, the wine is said not to be so good.

Besides the products already named, truffles (the famous Truffes de Périgord), the best in France, medicinal and aromatic plants, are abundant; fruit trees are cultivated to a great extent, especially the walnut for making oil. In the forests oak and chestnut are the prevailing trees. The annual produce of wine is 16,940,000 gallons, one-half of which is used for home consumption, and the rest exported or distilled into brandy and liqueurs; the best kinds are the white wines of the arrondissement of Bergerac. On account of the deficiency of grass-land, horses, cattle, and sheep are not numerous; pigs and goats are; poultry and game are abundant and excellent. Mules and asses are the common beasts of burden. The climate is mild. Snow sometimes falls, but seldom lies; winter and spring are rainy; summer is excessively hot in the valleys; the autumn is very delightful. Violent winds from the north and west are not unusual, and hailstorms often do great harm to the crops in summer. The department is traversed by 5 royal, 20 departmental, and 55 communal roads.

Mines of iron, coal, and manganese are worked; marble, alabaster, millstones, building and lithographic stones are quarried; lead, antimony, magnesia, slate, fullers' earth, plaster of Paris, &c., are found. There are 59 smelting furnaces and forges for the manufacture of hammered iron and steel; 1413 wind and water-mills; and 450 establishments of different kinds for the production of coarse woollens, serge, hosiery, brandy, oil, paper, leather, cutlery, &c. The commerce of the department consists of its iron, wine, hams, truffled turkeys, and leather.

The department contains 2,261,775 acres, about one-half of which is capable of cultivation; 222,138 acres are under vine-culture. The surface is distributed among 153,133 proprietors, and into 2,062,161 parcels. It is divided into 5

arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1841.
Périgueux . .	9	116	105,753
Bergerac . .	13	187	118,304
Nontron . .	8	87	83,889
Ribérac . .	7	93	70,974
Sarlat . . .	10	146	111,343
Total . .	47	629	490,263

In the arrondissement of Périgueux, the chief town, *Périgueux*, which is also the capital of the department, stands on the right bank of the Isle, at a distance of 296 miles from Paris, in 45° 11′ N. lat., 0° 43′ E. long., and has 12,187 inhabitants. The interior of the town is gloomy; the houses are large, high, and well-built of freestone, but the streets are so narrow and tortuous that the height of the houses serves to make them cheerless. The site of the old ramparts is now occupied by two handsome boulevards. The streets of the town present some curiously ornamented houses of the 16th century. The principal buildings are—the cathedral of St.-Front, the former church of the Jesuits, the town-house, the court-house, and the bridge over the Isle. Périgueux is the seat of a bishop, has tribunals of first instance and of commerce, a college, a public library of 16,000 volumes, an hospital, barracks, a theatre, a museum of antiquities, and also a garden of antiquities, in which the various fragments of Roman sculpture and architecture are arranged in order. It is supplied with water by public fountains, which are fed by an aqueduct lately completed. There are several pretty promenades ornamented with statues. The industrial products of the town are paper, woollen cloths, cutlery, hosiery, brandy, leather, nails, and the celebrated Pâtés de Périgueux, a confection made of partridges and truffles, which is largely exported; the town also trades in flour, salt, iron, wood, pork, groceries, poultry, and cattle. The market for pigs held here is the largest in France. Périgueux occupies the site of ancient *Vesunna*, the capital of the Petrocorii, whose name it subsequently bore. Its importance in ancient times is evidenced by its site at the junction of five Roman roads, and by the remains of a vast amphitheatre, aqueducts, baths, and several temples; but the most remarkable Roman building remaining is the circular tower called La Tour de Vesune, which is still 67 feet high, 200 round, and has walls 6 feet thick; it has neither doors nor windows, and the purpose of its erection is unknown. The other towns are—*St.-Astier*, which was formerly defended by a strong castle, still partly remaining: it stands on the Isle, 11 miles W. from Périgueux, and has 2600 inhabitants: and *Brantôme*, on an island in the Dronne, which was formerly famous for a Benedictine abbey. The abbey church, which dates from the 11th century, is a very interesting structure; the crypt contains some colossal bas-reliefs. The other remarkable structures are the abbey buildings, which are of vast extent, and the parish church, which dates from the 15th century, and contains fine specimens of wood carving; the town was formerly fortified, and was the scene of many a foray between the French, Normans, and English: population 2800. *Excideuil*, the birthplace of Marshal Bugeaud, on the Loire, a feeder of the Isle; *Hautefort*, 25 miles E. of Périgueux, on a hill, the crest of which is surmounted by a fine old castle; Savignac-les-Eglises, on the Isle; St. Jean-de-Vergt, 12 miles S. from Périgueux; and Thenon, 17 miles E.S.E. of it, are small towns of nearly 2000 inhabitants each, which give name to cantons.

In the arrondissement of Bergerac, the chief town, *Bergerac*, is situated in a fertile plain on the right bank of the Dordogne, 26 miles S.S.W. from Périgueux, and has 10,102 inhabitants. It is an ill-built place; the streets are narrow winding lanes; some good houses are seen in the market square, and near the bridge across the Dordogne. This bridge, which consists of five arches, the theatre, and the public library, are the most remarkable objects in the town, which has also tribunals of first instance and of commerce, a college, and an ecclesiastical school. In the neighbourhood there are several iron foundries and smelting furnaces. *Beaumont*, on the crest of a hill above the Couze, a feeder of the Dordogne; *Eymet*, on the left bank of the Dropt; Lalinde, 12 miles E. of Bergerac on the Dordogne; Monpazier, a well-built place on the Dropt; and St.-Alvaire, 20 miles E. from Bergerac, are places of about 2000 inhabitants each.

In the arrondissement of Nontron, the chief town, *Nontron*, an ill-built place, prettily situated on the slopes of two hills on the right bank of the Bandiat, has a tribunal of first instance, an hospital, and 3609 inhabitants, who manufacture cutlery and leather, and are employed in the iron and manganese mines and iron works of the neighbourhood. *Jumillac-le-Grand*, 20 miles E. of Nontron, on the left bank of the Isle, has several iron foundries and smelting furnaces, a fine old castle, from which the English were chased by Duguesclin in 1379, and 3194 inhabitants. *Thiviers*, an ill-built town, 15 miles S.E. from Nontron, stands on a steep hill, has tan-yards, paper-mills, potteries, tile-works, and iron-foundries; it trades in corn, wine, hides, cheese, truffles, &c., and has a population of 2400. Bussiere-Badil, 10 miles N. of Nontron, Mareuil-le-Jeune, La-Nouaille, St. Pardoux-la-Rivière, are places of less than 2000 inhabitants each, which give names to the other cantons.

In the arrondissement of Ribérac, the chief town, *Ribérac*, stands in a fertile district, on the Dronne, 23 miles W. from Périgueux; it is irregularly built, and has 3643 inhabitants, who trade in corn, linen, pigs, and leather. The old castle of the dukes of Turenne is the only interesting structure in the place. A tribunal of first instance is held here. *Neuvic*, on the left bank of the Isle, has 2254 inhabitants. *St.-Aulaye*, on the Dronne; *Mouponl*, on the left bank of the Isle, near which there is a large Roman camp; *Mussidan*, at the junction of the Crempre

with the Isle; and *Bourdeilles*, on a high rock overhanging the left bank of the Dronne, are the most important of the other towns, each having under 2000 inhabitants.

In the arrondissement of Sarlat the chief town is *Sarlat*, which stands 32 miles S.E. from Périgueux, in a hollow closed in by steep arid hills, and watered by the Sarlat, a small feeder of the Dordogne. The streets are narrow and crooked, the houses old and ill-built, the site gloomy and unhealthy. The town has tribunals of first instance and of commerce, a college, an ecclesiastical school, and 5941 inhabitants. The college buildings, the hospital, and the parish church, are the best of the public buildings. A good deal of paper and walnut-oil are made here. *Belvès* stands on a hill 13 miles S.W. from Sarlat, and has 2529 inhabitants, who manufacture paper, leather, hosiery, coarse woollens, and nut-oil. The town consists of a spacious square on the crest of the hill, and of several steep irregular streets, which lead into it. *Le-Bugue*, a pretty little town near the confluence of the Vezère and the Dordogne, has 2398 inhabitants, who manufacture woollens and nut-oil, and trade in wine and provisions with Bordeaux. There are also near the town at the village of Miremont, several iron-foundries, and one of the largest grottoes in Europe. *St.-Cyprien*, S.W. of Sarlat, on the right bank of the Dordogne, stands at the foot of a hill bristling with rocks, and at the entrance of a rich valley; it has 2324 inhabitants, and a much frequented mineral spring. *Montignac*, a considerable town on the Vezère, which here becomes navigable, has 3752 inhabitants; on a hill above it are the remains of a fine old castle, which played an important part in the wars with the English in the 14th century. *Terrasson*, higher up the Vezère, stands on the slope of a steep hill on the left bank of the river, which is passed by a fine bridge of recent erection; the streets are narrow and steep, but some of the buildings are good: the population is 2893. *Domme*, once an important fortress, on a high hill above the Dordogne and *Villefranche-de-Belvès*, in the south-eastern angle of the department, are the most important of the other towns, with about 2000 inhabitants each.

The department forms the see of the bishop of Périgueux; it is comprised in the jurisdiction of the Cour Royale and University Academy of Bordeaux, and belongs to the 11th Military Division, of which Bordeaux is head quarters. Under the late monarchy it returned 7 representatives to the Chamber of Deputies; it now sends 13 members to the National Assembly of the Republic.

(*Dictionnaire de la France;* Balbi, *Géographie; Annuaire pour l'An* 1847; *Decree of the Provisional Government of the French Republic.*)

DORDRECHT. [DORT.]

DORE'MA, a genus of plants belonging to the natural order *Umbelliferæ*. *D. ammoniacum* is a native of Persia, in very dry plains and gravelly soil, exposed to an ardent sun. This plant is one of those which yield gum ammoniacum.

DO'RIA, ANDRE'A, was born in 1466 at Oneglia, in the western Riviera of Genoa. Having lost his parents at an early age, Doria embraced the profession of arms, and served under several princes in various parts of Italy. Genoa had been for a long time distracted by factions, which had brought it under the dominion, or protection, as it was styled, of the Visconti and Sforza, dukes of Milan, and under the French when Francis had conquered Milan. The complaints of Doria to Francis against the oppression practised on his fellow citizens, led to an order for his arrest, but he, having been apprised of this order, offered his services to Charles V., who gladly accepted them, and promised to restore Genoa to its independence as soon as it was freed from the French. With the aid of his nephew, Filippino Doria, he gathered together fifteen galleys, and with this little squadron appeared before Genoa in 1528, and being favoured by the inhabitants, he obtained possession of the city, and drove the French away. Doria then reorganised the government of the republic, and was himself appointed censor for life, with the title of 'Father and Liberator' of his country. He now resumed his naval career as admiral of Charles V., and distinguished himself against the Turks and the Barbary pirates. He escorted Charles V. to the expedition of Tunis in 1535, and contributed greatly to the taking of the place; and in 1541, he commanded the fleet in the expedition of Charles V. against Algiers, from which he is said to have tried in vain to dissuade the emperor. It turned out as he had foreseen, and he could only save the emperor with a small part of the army. In his old age Doria retired to Genoa, where he lived in great splendour and reputation. At the beginning of 1547 his life was threatened by the conspiracy of Fieschi: his nephew Giannettino was murdered, but Andrea escaped, and Fieschi perished in the attempt. In 1548 some of the ministers of the emperor proposed to build a fortress and introduce a Spanish garrison into Genoa under the pretence of preventing any new conspiracies, but the Genoese appealed to Doria, who interposed and prevented the execution of the project. In 1552 Doria, then eighty-five years old, went to sea again, to attack his old enemies the Turks, but little was effected, and in 1556 he resigned his command to his nephew, Gian Andrea Doria, who was confirmed as admiral by Philip II. Andrea Doria died in his palace at Genoa in Nov. 1560. (Casoni, *Annali di Genova;* Botta, *Storia d'Italia.*)

DORIANS, the most powerful of the Hellenic tribes, derived their origin from a mythical personage named Dorus. Herodotus mentions (i. 52) five successive migrations of this race. Their first settlement was in Phthiotis, in the time of Deucalion; the next under Dorus, in Hestiæotis, at the foot of Ossa and Olympus; the third on Mount Pindus, after they had been expelled by the Cadmæans from Hestiæotis. The fourth settlement of the Dorians, according to Herodotus, was in Dryópis (afterwards called the Dorian Tetrápolis); and their last migration was to the Peloponnesus. The migration of the Dorians to the Peloponnesus, which is generally called 'the return of the descendants of Hercules,' is stated to have occurred eighty years after the Trojan war, *i. e.*

in 1104 B.C. (Thucyd. i. 12.) The origin and nature of the connection which subsisted between the Heracleidæ and the Dorians are involved in obscurity.

The government which the Dorians established in all the countries which they invaded and conquered was an aristocracy; for while the successful invaders remained on a footing of equality among themselves, all the old inhabitants of the country were reduced to an inferior condition. They were called περίοικοι, or 'dwellers round about the city,' a name corresponding exactly to the Pfahlbürger, or 'citizens of the palisade,' at Augsburg, who dwelt in the city suburbs without the wall of the city; to the 'pale' in Ireland before the time of James I.; to the people of the contado in Italy; and to the fauxbourgeois in France. The constitution of Sparta in particular was an aristocracy of conquest, as far as the relations between the Spartans and Lacedemonians were concerned, while the Spartans themselves lived under a democracy with two head magistrates, who were indeed called kings, but possessed very little power.

In addition to the Dorian settlements in the Peloponnesus, this race sent out many colonies; of these the most important were established along the south-west coast of Asia Minor. Rhodes, Cyprus, Corcyra, and Sicily, also had a Dorian population; Byzantium and Chalcedon were Megarian colonies; and the celebrated cities, Tarentum and Crotona, in Italy, were founded under the authority of Sparta.

(Müller's *Dorier*, Breslau, 1824, translated into English, with additions and improvements by the author, Oxford, 1830.)

DORIC DIALECT, a variety of the Greek language peculiar to the Dorian race. It was spoken in the Dorian Tetrápolis; in the greater part of the Peloponnesus; in the numerous Dorian colonies in Italy, Sicily, and Asia Minor; in Crete, Ægina, Rhodes, Melos, Corcyra, and Cyrene. As a written language it is divided by grammarians into two classes, the old and new Doric. In the former Epicharmus, Sophron, and Alcman wrote; in the latter, Theocritus, Bion, and Moschus. The lyric poets in general wrote in the Doric dialect, but Pindar wrote a language based upon the epic or Ionic dialect, with a liberal use of Doric and Æolic forms. The existing monuments of the pure Doric, in addition to the fragments of the old writers which have been collected, are the specimens in the comedies of Aristophanes, the treaties and decrees quoted by the Athenian historians and orators, and the inscriptions collected by Chandler, Mustoxidi, and Boeckh.

DORIC ORDER. [CIVIL ARCHITECTURE.]

DORIGNY, SIR NICOLAS, a French designer and engraver, was born at Paris in 1657. He lived twenty-eight years in Italy, devoting his time chiefly to etching and engraving, and he became one of the first of the French historical engravers in his style, being inferior to Girard Audran alone. He engraved many celebrated Italian paintings during his long stay in Italy, including three of the best pictures in Rome—the Transfiguration, by Raphael, in 1705; the Taking down from the Cross, by Daniele da Volterra, in 1710; and the Lame Man healed by St. Peter, by Cigoli: he engraved also the Gallery of Cupid and Psyche after Raphael.

He arrived in England in 1711, and commenced engraving the cartoons of Raphael in the following year. Queen Anne had given him a room in Hampton Court, with the necessary perquisites. The expense was defrayed by subscription at four guineas the set. The prints were, with the assistance of Charles Dupuis and Claude Dubosc, finished April 1, 1719, when he presented two complete sets to George I., who gave him a purse of 100 guineas, and knighted him in the following year.

Dorigny was elected a member of the French Academy of Painting in 1725, and died at Paris in 1746.

His elder brother Louis was a good fresco-painter: he lived chiefly in Italy, and died at Verona in 1742, aged eighty-eight.

(Vertue, *Catalogue of Engravers*, &c.; Watelet, *Dictionnaire des Arts*, &c.; Huber, *Manuel des Amateurs*, &c.)

DORIPPE (Fabricius), a genus of brachyurous decapod crustaceans (Crabs) belonging to the subdivision which have the feet of the fourth and fifth pairs elevated on the back, and not terminated with paddles, and the eyes supported upon simple peduncles (*Notopoda*). This genus is adopted by Latreille, Lamarck, Leach, Bosc, and Risso; it is the *Notogastropus* of Vosmaer, and was comprehended under the general term *Cancer* by Linnæus, Herbst, Aldrovandus, and Plancus.

The geographical distribution of this genus appears to be extensive in the seas of the warmer latitudes, where the water along the coasts is deep. The Mediterranean and Adriatic seas, and Manilla, are among the localities given.

Habits—not well known. The species haunt great depths in the sea, nor has it yet been proved whether they make use of the feet, elevated on the back, to lower themselves, like the *Dromiæ*, with foreign bodies. It is however very probable that such is their use.

Example.—*Dorippe lanata*, Latr.; *D. Facchino*, Risso; *Cancer lanatus*, Linn.—Locality, the Mediterranean and the Adriatic. The inhabitants of Rimini call it *Facchino*. (Desmarest.)

Fossil Dorippe.—Desmarest ('Histoire Naturelle des Crustacés Fossiles,' 1822) describes a species, *Dorippe Rissoana*, which has some resemblance to the *D. lanata*, and still more to the crab figured by Herbst under the name of *Cancer Frascone*; and, above all, to a species brought from New Holland by Péron, and named *Dorippe nodosa*. Desmarest observes that he is the more inclined to consider it as approaching very near to this last, inasmuch as he had thought that the specimen which he had described might not be in reality fossil. In fact, he adds, that though brown and shining, like the fossil crabs which come from the East Indies, it is much lighter, more friable, and not so much imbedded in the clay as they are. In his 'Considerations Générales sur la Classe des Crustacés' (1825), he describes the *Dorippe à quatre Dents*, with the

synonyms *Dorippe quadridens*, Fabr. Latr.; *Dorippe nodosa*, Coll. du Mus.; *Cancer Fresconc*, Herbst. 'This *Dorippe* from the East Indies,' he adds, 'has lately been brought from Manilla by M. Marion de Procé. It so much resembles a species which I have described with doubt as fossil, that I know not how precisely to point out the difference.' This species belongs to M. Defrance, who has stated its characters in the article 'Dorippe' (fossil) of the 'Dict. des. Sc. Nat.'

DORKING. [SURREY.]

DOROG. [HUNGARY.]

DORO'NICUM, a genus of plants belonging to the natural order *Compositæ*. The species are deciduous herbaceous plants. Two are natives of Great Britain. *D. pardalianches* is a rare plant, and found in damp and hilly woods and pastures. It has its specific name from παρδαλις, a tiger, and ἀγχω, to strangle, on account of the use said formerly to have been made of the plant for the purpose of destroying wild animals. With the species of *Arnica*, and other plants of the order, it has the common name of Leopard's Bane.

DORPAT, or DÖRPT (in Livonian, *Tehrpata*), the chief town of the circle of Dorpat, in the Russian government of Livonia, stands on the Great Embach, which is here crossed by a fine granite bridge, about 140 miles N.E. from Riga, and has 12,000 inhabitants. The town is built in the form of a semicircle; it is laid out in straight broad streets, and contains some handsome public buildings of freestone, particularly the government offices and university buildings. On an eminence, at the north-west of the town, stand the famous observatory of Dorpat, the buildings of the university library, and the medical school. The main support of the town is derived from internal trade, for which the Embach affords great facilities, and from the university students. A large fair is held in January for the sale of Russian and foreign manufactures. The university was founded by Gustavus Adolphus, in 1632, when Livonia belonged to the Swedish crown; it was reconstituted in 1802, by the Emperor Alexander, for the benefit of Livonia, Esthonia, and Courland. It has 30 professors, and consists of the four faculties of theology, law, medicine, and philosophy. In connection with it there are—a library of 60,000 volumes, collections of mineralogy, zoology, anatomy, philosophical apparatus, &c., a botanical garden, and several schools.

DORSET. [SACKVILLE.]

DORSETSHIRE, an English county, bounded E. by Hampshire, N. by Wiltshire, N.W. by Somersetshire, and W. by Devonshire; along all its southern borders it is washed by the English Channel. The greatest length from E. to W. is 58 miles; the greatest breadth from N. to S. is 40 miles. The area is 1006 square miles, or 643,840 acres. The population in 1841 was 175,043. A detached part of the county is wholly surrounded by Devonshire. The county is included between 50° 30 and 51° 5′ N. lat., and 1° 48′ and 3° 7′ W. long.

Coast, Surface, Hydrography.—At the eastern end of Dorsetshire the coast is precipitous; but the cliffs soon decline, and are succeeded by the sandy inlet of Poole Harbour, which receives several streams, has several smaller bays within it, and several islands, the largest of which is Brownsea. There is an alternation of sea-cliffs and low sandy shores, westward of Poole Harbour, diversified by the bays or inlets of Studland, Swanage, Durlston, Kimmeridge, Worbarrow, Weymouth, Lulworth, and Ringstead; and the points or headlands of Handfast, Peverel, Durlston, and St. Alban's Head (344 feet high).

Portland Isle, which bounds Weymouth Bay on the S.W., is not strictly an island, but is attached to the main land by a long ridge called the Chesil Bank. Portland is about 4 miles long by 1½ broad. The loftiest point is 358 feet above the level of the sea, and many of the cliffs are bold and lofty. The soil and herbage are both good, but the fertility is not great, and there are but few trees. There is one village, Chesilton, and several hamlets. There are two castles, Portland and Bow-and-Arrow. The Chesil Bank, which joins the island to the main land, and which is about 16 miles long, is a ridge of pebbles, resting on blue clay, in no place more than a quarter of a mile in width, and rising 20 or 30 feet in height. Between a portion of the Chesil Bank and the main land, is a narrow arm of the sea called the Fleet, which is in no place more than half a mile in width. The coast from the Chesil Bank to the borders of Devonshire is generally abrupt.

The surface of the county is for the most part uneven. The principal elevations are the chalk downs, which, entering Dorsetshire from Wiltshire on the northern side of Cranbourne Chase, turn to the south, and run to the valley of the Stour, in the neighbourhood of Blandford. From the valley of the Stour the chalk downs run nearly west to the neighbourhood of Beaminster, and forms the north boundary of the basin whose drainage is received by Poole Harbour. Some of the hills reach an elevation of 800 or 900 feet. The chalk hills from Beaminster run south-east or east, and form the South Downs, the highest points in which are along the southern escarpment. The hills gradually approach the coast a few miles north-east of Melcombe Regis. From Lulworth the chalk hills run eastward to Handfast Point. Pillesden Pen, the highest of the South Down Hills, is 934 feet high.

The Stour, the chief river of Dorsetshire, rises in Wiltshire, enters Dorsetshire about 4 miles from its source, and passes through Sturminster, Blandford, and Corfe Mullen, into Hampshire; it receives the waters of the rivers Shreen, Lidden, Cale, Allen, and Avon. The Yeo, Ive, or Ivel, flows from Milbourne Port, and traverses a very small part of Dorsetshire. The Piddle and the Frome, coming from different parts of the county, unite near Wareham, and flow into Poole Harbour. The western part of the county is watered by the Bredy, Brit, Char, and Axe.

There are no canals in Dorsetshire. The Southampton and Dorsetshire Railway enters the county near Wimbourne, and extends to Dorchester. Portions of the Wilts, Somerset, and Weymouth Railway are in this county. A breakwater is

now (June, 1848) being formed from the Isle of Portland, to convert the bay of Weymouth into a harbour of refuge.

Geological Character.—The North and South Downs inclose a basin, the 'Trough of Poole,' in which are the formations superior to the chalk; beyond or without this basin are the formations which underlie the chalk. The eastern parts of the county are mostly occupied by the plastic clay. Potters' clay in beds of various thickness and at different depths alternates with loose sand in this formation in the Trough of Poole. It is sent to Staffordshire, where it is mixed with ground flints, and employed in the finer kinds of pottery. Beneath the potters' clay lies a seam of very friable earthy brown coal, somewhat like Bovey coal. An extensive horizontal bed of pipe-clay skirts the northern declivity of the South Downs. The plastic clay is found capping one or two hills south-west of Dorchester. The chalk formation bounds the plastic clay. In the North Downs the chalk occupies a breadth of nearly 10 miles, and at its western extremity it is still broader. On the southern side of the Trough of Poole it becomes much narrower, scarcely averaging 2 miles in breadth. The cliffs along the south coast are partly chalk. The valleys, drained by the upper part of the Frome and its tributaries, are occupied by the green-sand. The chalk-marl, green-sand, weald-clay, and iron-sand skirt the chalk in the Isle of Purbeck, and extend along the coast between the chalk and the Purbeck and Portland limestone.

The Purbeck strata, belonging to the upper series of the oolitic formation, consist of argillaceous limestone alternating with schistose marl; they crop out from under the iron-sand in the Isle of Purbeck. A variety of the Purbeck stone, known as Purbeck marble, was formerly much used in building. The Portland oolite, another member of the same series, which succeeds the Purbeck stone, occupies the remainder of the Isle of Purbeck and the whole of that of Portland. It consists of a number of beds of a yellowish white calcareous free tone, generally mixed with a small quantity of siliceous sand. The varieties of this formation afford the greater part of the stone used for architectural purposes in London. In the Portland quarries, the saleable stone occupies layers or strata situated several feet beneath the surface; and the quarrymen have to exert great labour in the removal of the superincumbent rubbish, before they can reach the stone. The thickness of workable stone varies from 7 to 16 feet, and the works proceed at the rate of about an acre of good stone per annum. Almost the entire mass of Portland Isle consists of the Purbeck series. The base is formed of Kimmeridge clay, which descends to a (supposed) depth of 600 or 700 feet.

Towards the south-western shore of the Isle of Purbeck the sea has formed several singular coves, at the entrance of which are lofty headlands of oolite; while the cove or basin is excavated inland as far as the chalk. The precipitous sides of these basins exhibit in a most striking manner the formations between the chalk and the oolite. Westward of these coves occurs what is termed by geologists 'a saddle,' a double series of formations. After the green-sand, Purbeck and Portland beds, and Kimmeridge clay have successively cropped out from beneath the chalk, the coral rag and Oxford clay, members of the middle series of oolites, rise to the surface in succession, and are succeeded by the Forest Marble and the Great Oolite, which belong to the lowest series of the oolitic formations. To the southward of the Great Oolite and Forest Marble the superior strata reappear in a reverse order of succession; the Oxford clay, then the coral rag, and then the Kimmeridge clay. In the western and north-western parts of the county, the green-sand, the Kimmeridge clay, and a few other strata, crop out successively from beneath the chalk.

Climate and *Agriculture*:—The climate of Dorsetshire, though mild and healthy, is not so warm as its geographical situation would lead us to expect; a circumstance owing to the nature of the soil, and the bareness of its chalk hills, there being little or nothing to break the force of the winds that sweep over them. The air is keen and bracing, rather than soft and warm.

The whole surface of the county consists chiefly of loose sand and gravel, clay, and chalk. The most fertile spots are those where all the three have been mixed in the valleys by the rivulets which run down the hills carrying the soil with them. The poor sandy soil occupies that part of the county which joins Hampshire. Near the coast is a stratum of clay over the chalk. The arable land throughout the county bears but a small proportion to the pasture; and greater attention is paid to the rearing of sheep and feeding of cattle than to the raising of corn. The implements of husbandry are similar to those in use in Devonshire. The old method of managing arable land, which is still followed by many farmers, was to fallow every fourth year on the clays, and then take two or even three crops of corn in succession.

The most common rotation on the rich loams in the vale of Blackmore is: summer fallow—wheat—barley with grass seeds, which continue two or three years, and are then broken up again after the hay has been made, when a kind of bastard fallow succeeds, consisting of three ploughings, and the land is tolerably prepared for wheat.

On the light chalky soils turnips have been very generally introduced. The introduction of sainfoin on the dry chalky soils has been a great advantage, as it produces a rich fodder, requires little manure, and lasts many years. In this soil the wheat is generally sown after clover which has stood one or two years, but sometimes also after turnips or rape fed off. Wheat is sown sometimes in the light soils as early as August, and before the wheat crop of that year is ripe. In the heavier loams the wheat is sown later, sometimes not much before Christmas. Barley is here a more important crop than wheat. Oats are sown on the heavier and moister soils. Beans are planted or drilled in rows from eighteen to twenty-four inches distant. Turnips are generally sown broadcast, at the rate of 3 lbs. of seed per acre. Potatoes are cultivated to a considerable extent in

the rich loams about Bridport, Beaminster, Abbotsbury, &c. Sainfoin is sown with a spring crop. It is cut before the blossom is fully expanded, and made into hay, which is excellent fodder for sheep in winter. Hemp is cultivated to some extent in the richest soils, which contain a considerable proportion of sand, and are too light for beans. Flax is cultivated in the sound deep loams which have been gradually enriched by manuring the preceding crops. The grass lands and pastures occupy about three-fifths of the surface of the county. The meadows along the vale of Blackmore are extremely rich, and produce much hay, which is used to feed the dairy cows in winter. The pastures on the hills are not sufficiently rich to fatten oxen, but are well adapted to feed dairy cows.

The Dorset butter is in good repute in London and Portsmouth for ship provision as well as domestic use: it is not so salt as the Irish, and is therefore preferred, although the Irish is richer when it is of the best quality. Dorset salt butter, when well washed, is very commonly sold in London for fresh butter. The butter is made from the cream, and the skimmed milk is made into cheese. The Dorsetshire skim-milk cheese is preferred on account of streaks of blue mould which frequently run through it.

A few calves are annually reared to keep up the number of the cows. The cows kept for the dairy in the vales are chiefly of the Devonshire breed. Dorset sheep are noted as a profitable breed to those who rear house-lambs for the London market.

Divisions, Towns, &c.—Dorsetshire is divided into 9 divisions, which are subdivided into hundreds and liberties. It is in the diocese of Salisbury. It is included in the Western Circuit. The assizes and quarter-sessions are held at Dorchester. Three members are returned to parliament for the county, 2 for Bridport, 2 for Dorchester, 2 for Poole, 2 for Weymouth, 1 for Lyme Regis, 1 for Shaftesbury, and 1 for Wareham, making altogether 3 for the county and 11 for the boroughs.

The following are the principal towns, with the population of each in 1841 :—

Beaminster is a market-town, situated on the Brit, near its sources, 14¼ miles W.N.W. from Dorchester. The town is ancient, but most of it having been destroyed by fires in 1644 and 1684, the houses are chiefly modern and well-built, and the streets are paved and well lighted. The church, though only a chapel of ease, is large and handsome, with a tower 100 feet high, curiously sculptured. There is an endowed free-school, with a good school-building, in which 100 boys are educated. Population of the town, 2938.

Blandford Forum is 16 miles N.E. from Dorchester, and is situated on the Stour, which flows on the south and west sides of the town. The river, which is here of considerable width, is crossed by a bridge of six arches. The town was almost entirely destroyed by fire in 1731. The houses are consequently modern, and are built uniformly of brick, and the streets are regular and well paved. The town-hall and the church are both of Grecian architecture. Blandford is a municipal borough, and is governed by 4 aldermen and 12 councillors. Population, 3339.

Bridport. [BRIDPORT.]

Cerne Abbas is on the little river Cerne, a feeder of the Frome, 7½ miles N. by W. from Dorchester. Cerne is in a pleasant vale, surrounded by steep chalk hills. It is a very small town, with little trade except what is transacted at its weekly market. There was formerly at Cerne a Benedictine abbey, of which there remains a large square embattled tower, or gate-house, much dilapidated. There is an ancient bridge, once an appendage of the abbey, and a more modern bridge; both are of stone. Several overflowing wells still remain, formed by the monks, and having their sources through subterranean channels from the spring of St. Augustine. The parish church is a handsome building, in the perpendicular style of gothic architecture, with a fine tower, which has octagonal turrets and pinnacles. Population of the parish, 1342.

Corfe Castle is near the centre of the Isle or rather peninsula of Purbeck. The town consists of two streets of mean-looking houses, built of stone and covered with tiles. The inhabitants are chiefly engaged in the marble and stone quarries and clay-works in the neighbourhood. The church is a large and very ancient fabric, with many portions of Norman and early English architecture: it has an embattled and pinnacled tower. The castle, from which the town is named, was built by King Edgar. Its strength and situation on a high hill caused it to be regarded in former times as a fortress of great importance. Here King Edward the Martyr was assassinated by his step-mother Elfrida in 978 or 981. In the civil war of Charles I. Corfe Castle was defended for the king by Lady Bankes, wife of Lord Chief Justice Sir John Bankes, the owner of it, with the assistance of her friends and retainers, and of a governor sent from the king's army. It was however taken by the parliamentarians by treachery, February 1645–46, and dismantled. The ruins are extensive and massy, and from their high situation form a very striking object. The castle is separated from the town by a ditch, now dry, which is crossed by a bridge of four very narrow high arches. The town was a parliamentary borough, but was disfranchised by the Reform Act. Population of town and parish, 1946.

Cranborne is a small market-town, situated on the little river Allen, a feeder of the Stour, near its head, about 27 miles N.E. by E. from Dorchester. There was formerly a priory at Cranbourne. The parish church, formerly the priory church, is one of the oldest and largest in the county. The tower is of perpendicular architecture: the church has portions of an earlier character. Population of the parish, 2551.

Dorchester, a parliamentary borough, municipal borough, and the capital of Dorsetshire, is 137 miles S.W. by W. from London, by the South-Western Railway. The town is pleasantly situated on a slight elevation near the south bank of the Frome, and consists principally of three spacious streets, which are well paved and lighted. A delightful walk, well shaded, surrounds two-thirds of the town. The shire-hall is a plain building of Portland stone. The gaol, built in 1795, contains the county gaol, the house of correction, and

the penitentiary. The theatre was built in 1828. There are two churches. St. Peter's is a spacious structure of perpendicular architecture, with an embattled tower 90 feet in height. There are also places of worship for Baptists, Independents, Wesleyan Methodists, and Unitarians. There is a free grammar-school, founded and endowed in 1579, the government of which is vested in trustees. Dorchester was called *Durnovaria* and *Durinum* by the Romans. By the Saxons it was called *Dornceaster*. The town was strongly fortified and entirely surrounded by a wall, when in possession of the Romans. Many Roman coins and other remains have been found in the town and its vicinity.

Lyme Regis is a small sea-port town, 20 miles W. from Dorchester. The streets are narrow, irregular, and not well paved. The church is ancient. The harbour has little trade: the number of vessels registered Jan. 1, 1848, was 13 (820 tons). Lyme is a municipal borough governed by 4 aldermen and 12 councillors. Population, 2756. It is also a parliamentary borough, and returns one member. Population, 3376.

Milton Abbas is situated near the centre of the county, in a deep vale inclosed by steep chalk hills on the north and south side. Here was an abbey founded by King Athelstan, which alone gave any importance to the town, which was in former times more considerable than it is now. The hall yet remains, a noble and magnificent old room, part of the mansion of Milton Abbey. The conventual church was for some time the parish church, but a late earl of Dorchester having built a new parish church, converted the old one into a private chapel. It consists of the choir, transepts, and tower of the old abbey church: the choir is chiefly of early decorated character, the transepts and tower perpendicular. The general appearance of this edifice is very fine. Population of the parish, 833.

Poole, a municipal borough, parliamentary borough, and sea-port, is situated on the northern side of a considerable inlet, which forms the harbour, and opens into the bay which extends between Hengistbury Head and Durlestone Head, in the English Channel. Poole is 119 miles from London by the South-Western Railway, and 18 miles E. from Dorchester by the Dorchester continuation of the same railway. Poole harbour has a very narrow entrance, but extends inland several miles, forming a large sheet of water when the tide is in, but an assemblage of mud banks divided by narrow channels when the tide is out. The town is built on a peninsula on the north side of the harbour; the streets are irregular, but the houses are generally good, and some are of a superior class. The parish church has been rebuilt of Purbeck stone, and there is also a chapel of ease, as well as several places of worship for dissenters. The harbour is safe, with good quays and wharfs, and has a good coasting trade. The number of ships registered Jan. 1, 1848, was 116 (13,641 tons). The municipal borough is governed by 6 aldermen and 18 councillors. Population, 6093. The parliamentary borough returns two members. Population, 8449.

Shaftesbury is a municipal borough and parliamentary borough, near the borders of Wiltshire, about 25 miles N.E. by N. from Dorchester. The situation of the town is bleak and exposed, mostly on the top of a steep hill, and is badly supplied with water, which is chiefly drawn by machinery from a well of very great depth. The town has four churches and several places of worship for dissenters. There was formerly an abbey at Shaftesbury, but there are hardly any remains of it. The municipal borough is governed by 4 aldermen and 12 councillors. Population, 3170. The parliamentary borough returns one member. Population, 9462.

Sherborne is a market-town of ancient origin, and which had an abbey and a castle. The town is pleasantly situated in a vale on the small river Ivel, an affluent of the Yeo, about 17 miles N. by W. from Dorchester. The church is a large structure, which belonged to the abbey, and exhibits various styles of architecture. It has a central tower 150 feet high. There are several remains of the conventual buildings; the remains of the castle are on a rocky eminence at the east end of the town. There is an endowed grammar-school, with about 30 boys on the foundation. Population of the town, 4758.

Stalbridge is a small market-town near the borders of Somersetshire, about 18 miles N. from Dorchester. The church is large and ancient, and there is an ancient cross in the market-place. Population of the township, 1297.

Sturminster is a small market-town on the north bank of the Stour, about 16 miles N.N.E. from Dorchester. It is connected by a bridge with Newton-Castle on the south bank. The church is large, with an embattled tower, and there is an ancient market-house. Population of the town, 995.

Wareham is a parliamentary borough, 10 miles S.W. from Poole, and 18 miles E. from Dorchester, on an eminence between the rivers Frome and Piddle, which unite three miles below the town, and form a river up which vessels of large size can sail from Poole Harbour. Small vessels of 20 or 30 tons can sail up to the quay at Wareham, which is a member of the port of Poole. The town is compactly built, with two wide main streets. Population of the town, 2746; of the parliamentary borough, which returns one member, 6646.

Weymouth and *Melcombe-Regis* form one municipal borough and one parliamentary borough, Weymouth being the name generally applied to both places. The two towns form a sea-port on the shore of Weymouth Bay, where it communicates by an arm of the sea with a small internal bay, about two miles long, called the Backwater, which is an æstuary of the small river Wey. The harbour is in the arm of the sea which connects the Backwater with Weymouth Bay, Weymouth being on the south side of the harbour, and Melcombe-Regis on the north side. The two towns are connected by a handsome stone bridge. Weymouth proper has the appearance of an old fishing-town, with mean-looking houses and narrow streets. Melcombe is situated on a tongue of land between Weymouth Bay and the Backwater,

having in front of the Bay a broad terrace called the Esplanade, nearly a mile long, with a gradual slope towards the sea. Handsome ranges of houses face the Esplanade, most of which are lodging-houses for those who resort to the town as a bathing-place, for which it is excellently adapted, the sand being smooth and firm, and the slope gradual. George III. had a royal lodge erected there, and his visits were frequent. There are assembly-rooms, a theatre, two churches, and places of worship for dissenters. The number of vessels registered Jan. 1, 1848, was 78 (6760 tons). Ship-building and rope-making are carried on, but little is done in any other trade. The municipal borough is divided into 2 wards, and has 6 aldermen and 18 councillors. Population, 7708. The parliamentary borough returns 2 members to the House of Commons, and has a population of 8784.

Wimborne-Minster, a very ancient market-town, on the road from Salisbury to Poole, and 7 miles N. from Poole, is situated on the Stour, near its confluence with the Allen. A nunnery was established here in the eighth century, on the site of which the present minster, or collegiate church, was erected soon after the Norman Conquest. The minster consists of a nave, choir, transept, three porches, a central tower, and a tower at the west end. The minster is a royal free chapel, and a peculiar in the diocese of Salisbury. The town has little trade. Population, 1687.

History and Antiquities.—The county was, in the earliest period noticed by history, inhabited by a people whom Ptolemæus calls Δουροτριγες (Durotriges), who are believed to have been a Belgic race. Upon the conquest of South Britain by the Romans, Dorsetshire was included in Britannia Prima. Of this early period there are several remains in various camps and earth-works, stone circles, cromlechs, and barrows. In the north-eastern part of the county and the adjacent part of Wiltshire, are several embankments with ditches: they all run in a winding and irregular manner mostly from south-east to north-west, having the ditch on the north-east side. There are several Roman camps in the county. Mr. Hutchins enumerates twenty-five; and the walls and amphitheatre of Dorchester, and the coins and pavements found there, are monuments of the same victorious people. Two or three Roman stations were found in the county; and also several roads, of which the chief was the Icknield-way.

When the Saxons established their octarchy, Dorsetshire was included in the kingdom of Wessex; and even after the West Saxon princes acquired the sovereignty of England, they resided occasionally in this county. In the invasions of the Danes this county suffered severely, especially in A.D. 1002, when Sweyn, king of Denmark, in his invasion of England, destroyed Dorchester, Sherborne, and Shaston, or Shaftesbury. Throughout the middle ages, few events of historical interest connected with the county occur. In the civil war of Charles I. the gentry were mostly for the king; but the people of the towns, where the clothing trade was then carried on, and of the ports, were for the parliament.

DORSIBRANCHIA'TA, Cuvier's appellation for the second order of Annelids, which have their organs, and especially their branchiæ, distributed nearly equally along the whole of their body, or at least a part. *Chloeia* (Savigny) and *Cirratulus* (Lamarck), with many other genera, which our limits do not permit us to enumerate, belong to this order. The reader is referred to Lamarck (*Animaux sans Vertèbres*, tome v.); to Savigny (*Eg. Annel.*); and to Cuvier (*Règne Animal*, tome iii.) as the principal guides on this subject. [ANNELIDA.]

DORSTE'NIA, a genus of plants of the family of the *Urticaceæ*. The roots of several species of this genus are all confounded under the appellation of Contrayerva Root, but as they all possess nearly the same chemical composition and properties, it is of little importance which particular species yields what is used. The root is recommended in the low stages of fever, especially of children; but Serpentaria Root may at all times be advantageously substituted for it.

DORT, or DORDRECHT, an ancient city, once the capital of the Dutch province of South Holland, is situated on an island formed by the Maas, 12 miles S.E. from Rotterdam, in 51° 49′ N. lat., 4° 38′ E. long., and has a population of 20,000. It has a good harbour, and great facilities for trade. By means of canals goods are conveyed into the heart of the city. The principal trade is in corn and in wood, large rafts of which are brought down the Rhine and broken up for sale. There are many saw-mills in the town, and ship-building also forms an important branch of its industry. The old church, the town-hall, and the *Kloveniers Doelen* inn, in which the Synod of Dort was held, are the most interesting buildings.

DORT, SYNOD OF. [COUNCILS.]

DORTMUND, a town in the Prussian province of Westphalia, is situated on the Emscher, in 51° 30′ N. lat., 7° 27′ E. long., and has 6500 inhabitants. It is an old ill-built place, surrounded with a wall which has 5 gates. It has considerable manufactures of linen, nails, tobacco, and beer, and also an extensive trade in corn and colonial produce.

DOSSI, DOSSO and GIOBATTISTA, two Ferrarese painters, were born about 1480–1490, at Dosso, near Ferrara, and first entered the school of Lorenzo Costa, after leaving whom they studied together six years in Rome, and five years in Venice. There are still several of their joint works in or about Ferrara; they made the cartoons of the tapestries in the cathedral of Ferrara, and of those in the palace and in San Francesco at Modena, representing the deeds of the family of Este. They are praised and enumerated by Ariosto among the other great painters of Italy. ('Or. Fur.' xxxiii. 2.) Dosso painted the portrait of Ariosto, and made illustrations to the 'Orlando Furioso;' he painted also the head of Ariosto in a picture of Paradise now in the possession of the Academy of Sciences of Ferrara, formerly the Academy Degli Intrepidi.

There is a good collection of Dosso's oil-paintings in the gallery of Dresden. Dosso survived his brother some years; he died about 1560.

(Frizzi, *Guida di Ferrara;* Lanzi, *Storia Pittorica*, &c.)

DOT, in music, a point, or speck, placed after a note or rest, in order to make such note or rest half as long again. In modern music a double dot is often used, in which case the second is equal to half of the first.

DOTIS. [HUNGARY.]

DOTTREL. [PLOVERS.]

DOUAI, a large, ancient, and important town on the Scarpe, in the French department of Nord, stands in 50° 22′ N. lat., and 3° 4′ E. long., at a distance of 80 miles S.W. from Brussels and 149 N. by E. from Paris by the railroad which joins those cities, and has 23,203 inhabitants. It is surrounded by ancient walls, flanked with towers and laid out in agreeable promenades. The town is further defended by a fort on the left bank of the Scarpe. The streets are well laid out. The town-hall, the church of St.-Pierre, the cannon-foundry, and the arsenal, are the principal buildings. The inhabitants are engaged in the manufacture of linen, lace, thread, gauze, cotton, soap, glass, leather, beer, gin, pottery, paper, oil, chemical products, and refined sugar. A considerable trade is carried on also in corn, wine, brandy, chicory, wool, hops, flax, woollen cloth, and cattle. Douai is the seat of a Cour Royale and of a University Academy, which have jurisdiction over the departments of Nord and Pas-de-Calais; it has also a college for Roman Catholic priests, founded by Cardinal Allen, an Englishman; a royal college; a school of artillery; a school of drawing and music; a public library, which contains 27,000 volumes; a museum of natural history; a botanic garden; and a collection of paintings and antiquities; several hospitals; and a theatre. A tribunal of first instance is held here. Exhibitions of the industrial products take place every two years. The commerce of the town is more active than formerly, in consequence of its connection by railroads with the chief towns of France and Belgium. Douai has also extensive communication by means of the Scarpe, which falls into the Schelde, and by numerous canals that connect it with the principal trading towns of France, Belgium, and Holland.

DOUARNENEZ. [FINISTE'RE.]

DOUBLE-BASE, or *Contra-Basso*, the largest musical instrument of the viol kind. In England, Italy, and France, it has three strings; in Germany a fourth is added. From the body and firmness of its tone, it is considered to be the foundation of an orchestral band.

DOUBLOON. [MONEY.]

DOUBS, a department in the east of France, formed out of the old province of Franche-Comté, is bounded N.W. and N. by the departments of Haute-Saône and Haut-Rhin, S.W. and S. by the department of Jura, and E. by Switzerland. It extends from 46° 35′ to 47° 31′ N. lat., and from 5° 39′ to 6° 58′ E. long.; its length from N. to S. is 66 miles, from E. to W. 60 miles. The area is 2028 square miles, and the population in 1841 was 286,236, which gives 141.076 to the square mile, or 26.925 below the average per square mile for all France.

The department presents high mountains, forests, narrow valleys, heaths, rocks, marshes. It is crossed from N.E. to S.W. by four parallel chains of the Jura mountains; in the highest of these, which runs along the Swiss frontier, are the summits Mont-d'Or and Mont-Suchet, respectively 4920 and 5248 feet high; the other chains become successively lower, so that the highest point in the western chain, Roche-d'Or, is only 2860 feet in height. The two more eastern chains have their sides clothed with pine forests, the perpetual verdure of which forms a deep contrast with the snows that cover the mountain tops during six months of the year, or, in the absence of snow, with the bare rocky crags which occupy the crests of these chains; on their southern slopes, however, there is good pasturage during the summer and autumn, to which numerous herds of cattle are driven; and here in the *chalets* or shepherds' huts (the only habitation met with in these regions) a great quantity of excellent butter and cheese is made. Even in the valleys of this region little attention is paid to the cultivation of the soil, in consequence of the length of winter, the depth of the snow, and the short continuance of the fine season. The only crop is oats, of which a good deal is grown, but even this crop is sometimes lost under the early snow. The other two chains, though they present many bare rocky heights, have a milder climate, forests of oak and beech instead of pine, and a more fertile soil in the valleys, which yield wheat, but in no great quantity; the vine is cultivated on sheltered spots facing the south. The west of the department, between the Doubs and the Oignon, is comparatively level, very fertile, and much more densely peopled than the highlands; here the hills are covered with vineyards, and the plains abundantly produce wheat, maize, hemp, flax, fruits, and other crops. The valleys which separate the mountain chains are longitudinal, that is, they run in the direction of those chains; they vary greatly in width, in some places opening out into tolerably wide basins, but frequently contracting into deep narrow gorges. The climate is cold but healthy in the mountainous districts, where the snow lies commonly from October till April; in the western plains the temperature is more genial; west and north-west winds are frequent, and bring rain; the S.W. is ordinarily violent and dry.

The production of bread-stuffs is not sufficient for the consumption; of wine the annual produce is only 3,784,000 gallons; walnuts, cherries, and other fruit-trees are extensively cultivated. Horned cattle, resembling the Swiss breed, and horses, are reared in great numbers. The rivers abound with trout, perch, tench, eel, carp, pike, crab, &c. Iron and coal mines are worked; marble, gypsum, and building-stone are quarried; marl, fuller's and potter's clay are found; and peat for fuel is dug in many places. The mountain pastures abound with medicinal and aromatic plants, and of these large quantities are gathered.

In the mountainous districts the rearing of cattle, and the making of cheese and butter, is the chief occupation of the population; the annual value of the cheese made in the department is

1,650,000 francs, that of the butter only 260,000 francs. The cheese is of good quality, and resembles Gruyère. Of manufacturing industry, properly so called, the products furnished by the department are—watch and clock movements, cotton and woollen cloths, cotton yarn, hosiery, paper, glass, glue, leather, beer, hammered iron, steel, iron wire, files, scythes, and other agricultural implements. A good deal of kirschwasser and extract of wormwood is made. The commerce, a large proportion of which is carried on with Switzerland, consists in the articles named, and in hides, cattle, timber, deals, oak staves, tin and iron ware, &c. There are 433 corn and other mills in the department, most of which are worked by water power; 35 iron-foundries and smelting furnaces, and 156 factories of different kinds. Fairs to the number of 270 are held yearly. Roadway accommodation to the extent of 310 miles is afforded by 5 royal and 21 departmental roads.

The department takes its name from the river Doubs, which traverses it twice throughout its entire length. This river rises at the foot of Mont Rixon, in the south-east of the department, and runs in a north-east direction for about 70 miles, partly in the Swiss canton of Neufchâtel; at this distance from its source, striking against the chain that connects the Vosges and the Jura mountains, it glances off to westwards for about 16 miles as far as St.-Hippolyte, where it receives the Dessoubre on the left bank, and takes a northern direction to within 4 miles of Montbelliard; here making a rapid semicircular sweep, first to the east and then to the north-west, it finally flows S.W., passing Clerval, Baume-les-Dames, and Besançon; a few miles below this last town it enters the department of Jura, where it receives the Loue on its left bank, and, taking a more southerly course, reaches the department of Saône-et-Loire, in which it joins the Saône on its left bank at Verdun, after a course of 211 miles, and a descent of 2605 feet. In its upper course the Doubs flows between pine-clad mountains over a limestone bed, in the cavities of which the clear rapid stream sometimes disappears altogether. On approaching the Swiss frontier in the lower part of the canton of Marteau, the river, increased by numerous streams, forms a fine broad sheet of water, pent in at its northern extremity by the mutual approach of the wild rocky precipices on each side, which leave a passage only 27 feet in width; through this gorge the river dashes perpendicularly down a space of 87 feet, and forms a most magnificent cataract; the snowy foam and thundering roar of which strikingly contrast with the gloom and silence of the frowning rocks and dark forests above. This cataract called le Saut-du-Doubs, or 'the Doubs' Leap,' is the finest in this part of France. A great deal of timber is floated down the river. The navigable reaches of its south-western course form part of the canal du-Rhône-au-Rhin, which, leaving the Saône near St.-Jean-de-Losne and running along the western valley of the Doubs, joins the Rhine near Mulhausen. The only other river worth notice is the Oignon, which rising in Haute-Saône, and flowing due S. to near Villers-Sexel, then turns S.W., separating the department of Haute-Saône from those of Doubs and Jura, and enters the Saône just within the department of Côte-d'Or after a course of 68 miles.

The surface of the department contains 1,297,872 acres, distributed among 98,603 proprietors, and subdivided into 1,287,439 parcels. About 478,900 are more or less capable of cultivation; 301,000 are under woods and forests; 176,000 are mountain pasture: and 254,000 are irreclaimable heaths and marshes. The whole department is divided into 4 arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1841.
Besançon . .	8	209	106,041
Baume-les-Dames . .	7	189	68,357
Montbelliard .	7	162	61,100
Pontarlier . .	5	89	50,738
Total. . .	27	649	286,236

In the arrondissement of Besançon the chief town is BESANÇON. *Ornans*, the only other town worth notice, is prettily situated on the Loue, which is crossed by two stone bridges, at a distance of 16 miles from Besançon; it is well built. The most remarkable structures are the church of St.-Laurent and the town-house, in connection with which are the market-hall and prison. On an elevated platform commanded by high hills, and just outside the town, are the ruins of a strong old castle, one of the residences of the old dukes of Bourgogne. The town has an ecclesiastical college, and 2306 inhabitants, who manufacture paper, leather, kirschwasser from the cherries abundantly grown in the neighbourhood, and extract of wormwood.

In the arrondissement of Baume-les-Dames, the chief town is *Baume-les-Dames*, which stands on the right bank of the Doubs, and on the Canal du-Rhône-au-Rhin, at the extremity of a fine plain inclosed by vine-clad hills. It is a neat little town, and contains a fine church, an hospital, a college, a public library, and a tribunal of first instance. The population is 2543; they manufacture iron, glass, paper, leather, &c. *Clerval*, higher up the Doubs; *Isle-sur-Doubs*, still more to the northward; *Rougemont*, near which there are extensive stalactite caverns; and *Vercel*, 13 miles S.E. of Baume, are small places, which give name to some of the other cantons, and have about 1500 inhabitants each.

In the arrondissement of Montbelliard, the chief town, *Montbelliard*, stands in the northern angle of the department, in a valley between the Vosges and the Jura mountains, 48 miles N.E. of Besançon, and has a tribunal of first instance, a college, and 5789 inhabitants. It is situated at the confluence of the Alan and the Lusine, about 3 miles N. of the point where their united waters enter the Doubs. The town is well built, and ornamented with several fountains; the most remarkable buildings are—an old castle flanked by strong towers, which now serves for a prison, the church of St.-Martin, the town-house, the market-house,

and the hospital. Watch and clock movements, hosiery, files, cotton yarn, leather, scythes, and other agricultural implements are manufactured; there is also a brisk trade in corn, colonial produce, cheese, linen, deals, oak planks and staves, timber, &c. There is an Anabaptist chapel at Montbelliard. *Audincourt*, 3½ miles from Montbelliard, is a small place of only 1627 inhabitants; but it has one of the finest establishments in France for the manufacture of iron, yielding annually 500 tons of pig, 2000 tons of hammered, and 500 tons of sheet iron, besides 20,000 cases of tinned plates. The places that give name to the other cantons are mere hamlets.

In the arrondissement of Pontarlier, the chief town is *Pontarlier*, which stands in a valley between the Jura mountains, at the junction of the Drageon with the Doubs, 35 miles S.E. from Besançon, and has 4965 inhabitants. It is well built, with neat houses arranged in wide straight streets; the principal buildings are the cavalry barracks, the college, the market-house, and the town-hall. The town is the seat of a tribunal of first instance, and has a public library, a communal college, large iron-foundries and smelting furnaces, hydraulic saw-mills, a copper-foundry, a brewery, and several tanyards. Besides the products intimated, cheese, cattle, horses, watches, extract of wormwood, paper, and agricultural implements enter into the commerce of the town. *Mont-Benoit*, a small place 9 miles from Pontarlier, deserves mention only on account of the large buildings of the Benedictine Abbey from which it takes its name. *Marteau*, a small place of great manufacturing industry, on the left bank of the Doubs; and *Mouthe*, near its source, the inhabitants of which are engaged in felling timber, and in rearing cattle and horses, are the only other places worth notice.

The department, together with that of Haute-Saône, forms the arch-diocese of Besançon; it is under the jurisdiction of the Cour Royale and of the University Academy of Besançon, and belongs to the 6th Military Division, of which Besançon is head-quarters. Under the late monarchy it returned 5 representatives to the Chamber of Deputies; it now sends 7 members to the National Assembly of the Republic.

(*Dictionnaire de la France;* Balbi, *Géographie; Decree of the Provisional Government of the French Republic; Annuaire pour l'An* 1847.)

DOUCE, FRANCIS, was born in 1762. He was the youngest son of Thomas Douce, who was one of the Six Clerks. Francis was sent to school at Richmond in Surrey, where he learnt Latin and some Greek. His father, who died in 1799, left him a considerable property, which was increased by his marriage, and by a legacy from Nollekens. Douce was a Fellow of the Antiquarian Society, and was in habits of constant intercourse, both personal and by correspondence, with almost all the leading antiquarians of his time. He was a great collector of scarce books, prints, coins, medals, and all kinds of curious antiquities. He died at his residence in Gower Street, London, March 30, 1834.

Douce published, in 1807, 'Illustrations of Shakspeare and Ancient Manners,' 2 vols. 8vo. London. He also published, about the beginning of 1834, 'The Dance of Death, exhibited in elegant Engravings on Wood, with a Dissertation on the several Representations of that Subject, but more particularly of those ascribed to Macabre and Hans Holbein,' 8vo. London. These are the only works which Douce published separately. He has some essays in the 'Archæologia,' and there are many communications by him to the 'Gentleman's Magazine.'

Douce was a mere antiquarian. As a critic on Shakspere, his remarks are of little value when true, and they are frequently erroneous, though sufficiently arrogant. As an illustrator of ancient manners, he has been more successful.

His printed books, prints, drawings, illuminated manuscripts, coins, and medals, he left to the Bodleian Library, Oxford. His miscellaneous antiquities he left to Dr. Meyrick, of Goodrich Castle, Wales. The manuscripts of his own writing, together with all his correspondence, he directed to be inclosed in a strong box, sealed up, and given to the British Museum, with this inscription on the box, 'Mr. Douce's Papers, to be opened in the year 1900.'

DOUGLAS, GAWIN, was a descendant of the house of Douglas, which, from the 12th century till the present time, has produced many individuals of considerable eminence; but as they were chiefly warriors or statesmen, the events of their lives form a part of the general history of the country. The exception is Gawin, the poet. He was born in 1474 or 1475, and was the third son of Archibald, sixth earl of Angus, surnamed Bell-the-Cat. Being intended for the church, he received the best education which Scotland and France could give. He obtained successively the provostship of the collegiate church of St. Giles's, Edinburgh, and the rectorship of Heriot church. He was then made abbot of Aberbrothick, and lastly, bishop of Dunkeld, but his elevation to the archbishopric of St. Andrew's was prevented by the pope. In 1513 some political intrigues compelled him to retire to England, where he was favourably received by Henry VIII. He died of the plague in 1521 or 1522, at the Savoy, where he had resided during the whole of his stay.

In his early years he translated Ovid's 'Art of Love,' and composed two allegorical poems, 'King Hart' and 'the Palace of Honour:' but he is best and most deservedly known by his translation of Virgil's 'Æneid,' which, with the thirteenth book by Mapheus Vegius, was produced in 1513. To each book is prefixed an original prologue, some of which give lively and simple descriptions of scenery, written in a manner which proves the author to have been possessed of considerable poetical power.

Those who take the trouble to examine the writings of Douglas for themselves will find his language not nearly so different from our own as might be imagined from a cursory glance at the pages.

DOUGLAS, DAVID, was born at Scone, in Perthshire, in 1798, where his father was a working mason. He received a plain education

at the parish school of Kinnoul, and was early placed as an apprentice in the garden of the Earl of Mansfield at Scone Palace. As a lad he was remarkable for his fondness for books and the study of plants. In 1818 he went to live at Valleyfield, the seat of Sir Robert Preston, Bart., whose garden was then celebrated for its choice collection of exotic plants. Here he was treated by the head-gardener, Mr. Stewart, with great kindness, who procured him access to Sir Robert's valuable botanical library. From Valleyfield he removed to Glasgow, where he was employed in the botanic garden of the university. His intelligence attracted the attention of Dr. (now Sir William) Hooker, who was the professor of botany at Glasgow, and he made him his companion in his botanical excursions for the purpose of collecting materials for his 'Flora Scotica.' By Sir William Hooker he was recommended to the Horticultural Society of London as a botanical collector, and in 1823 he was sent to the United States, where he procured many fine plants, and greatly increased the collection of fruit trees in the possession of the society. In 1824 he was sent by the Horticultural Society to explore the vegetable productions of the country adjoining the Columbia River, and southwards towards California. He arrived at Fort Vancouver, on the Columbia River, in April 1825. During his journey he sent home from time to time large numbers of beautiful plants, with seeds and dried specimens. Of the genus *Pinus* he discovered several species of gigantic size, one of which has been named after himself, *P. Douglasii*. In the spring of 1827 he went from Fort Vancouver across the Rocky Mountains to Hudson's Bay, where he met Captain (now Sir John) Franklin, Dr. Richardson, and Captain (now Sir George) Back, returning from their second overland arctic expedition. With these travellers he returned to England, bringing with him the results of his researches. He remained in London two years, and sailed again for the Columbia River in 1829. He afterwards went to the Sandwich Islands, where he had remained some months when an accident put an end to his existence. The natives of the Sandwich Islands are in the habit of making pits, in which they catch the wild bulls. In one of his excursions Mr. Douglas fell accidentally into one of these pits, in which an infuriated animal was already trapped. The animal fell upon him, and he was found dreadfully mutilated and quite dead, July 12, 1834.

Of modern botanical travellers, Douglas was one of the most enterprising and successful. Almost all the new hardy plants of our gardens were introduced by him. To him we are not only indebted for many valuable timber trees, for numerous species of the beautiful genus *Ribes*, and other ornamental shrubs; but the favourites of every garden—the *Clarkias*, *Penstemons*, *Œnotheras*, and *Lupines*, were almost all first collected by him.

DOUGLAS. [Man, Isle of.]

DOUM. [Doom.]

DOUR. [Hainault.]

DOURA, or DURRA. [Sorghum.]

DOURO, or DUERO, a river of Spain and Portugal, rises in the north part of the province of Soria in Old Castile. It flows first S., passing the town of Soria, then W. through the provinces of Burgos, Valladolid, and Zamora, receiving numerous affluents, the principal of which are the Pisuerga, the Seguillo, and the Esla, which are noticed in the articles on the provinces through which they flow. After receiving the Esla, the Douro reaches the frontiers of Portugal, where it turns S., and for about 50 miles separates the province of Salamanca in Spain from that of Tras-os-Montes in Portugal. In this part of its course it receives the Tormes and the Agueda. The Douro then turning again W., and crossing the north of Portugal, divides the provinces of Tras-os-Montes and Entre-Douro-e-Minho from that of Beira, and enters the Atlantic 2 miles below the city of Oporto, of which it forms the harbour. The whole course of the Douro with its windings is about 500 miles, through some of the finest and most fertile regions of Spain and Portugal. The bar at the mouth of this river prevents large vessels from entering it; ships of 16 feet draught can scarcely get in even at high water. For river-craft the Douro is navigable above 100 miles inland, and affords a ready outlet for the wines, oil, wool, cork, fruit, &c. of the rich provinces which it drains.

DOUW, GERARD, was born at Leyden in 1613. He studied drawing under Bartholomew Dolendo, and was afterwards instructed by Peter Kouwhoorn, a painter on glass, and then by Rembrandt. From that great painter Gerard learned the mastery of colour and chiaroscuro; but he differed entirely from his teacher in his manner of painting. Instead of growing bolder and rougher in his handling as he grew older, he became more and more delicate in his finish, elaborating everything which he touched with the most exquisite delicacy and minuteness, in so much that the threads of brocades, and of fine carpets are expressed even in his smallest paintings. Nothing escaped his eye nor his pencil. And yet with all his elaboration of detail his pictures are powerful in effect, and harmonious and brilliant in colour. Gerard Douw died in 1680. His pictures are in all great collections. (Argenville; Sandrart.)

DOVE. [Derbyshire.]

DOVEDALE. [Derbyshire.]

DOVER. [Kent; Delaware.]

DOVES. [Columbidæ.]

DOVETAIL is the end of a piece of wood fashioned into the fan-like form of a dove's tail, and let into a corresponding hollow of another piece of wood.

DOVRE FIELD. [Norrska Fiellen.]

DOWAGER is a widow who is endowed [Dower]; but the term is often applied to ladies of rank, whether they may be endowed or not.

The Queen Dowager is the widow of a king, and she has many of the privileges of a queen-consort.

The queen-dowager, Adelaide, has by act of parliament (1 & 2 Wm. IV. c. 11) a pension of 100,000*l.*, and also Marlborough House, London,

and the rangership of Bushy Park, in Middlesex, for life.

DOWER is that part of the husband's lands, tenements, or hereditaments, to which the wife is entitled for her life upon the husband's death.

The law of dower was regulated by 3 & 4 Wm. IV. c. 105, which abolished certain kinds of dower. The objects of this act were—1, to make equitable estates in possession liable to dower; 2, to take away the right to dower out of lands disposed of by the husband absolutely in his life or by will; 3, to enable the husband, by a simple declaration in a deed or will, to bar the right to dower.

Dower at common law is the only species of dower which affects lands in England generally; dower by custom is only of local application, as dower by the custom of Gavelkind and Borough English; and Freebench applies exclusively to copyhold lands.

As to dower at common law, every married woman who has attained the age of nine years is entitled to dower by common law, except aliens, and Jewesses, so long as they continue in their religion. From the disability arising from alienage, a queen, and also an alien licensed by the king, are exempt.

The wife is entitled to be endowed, that is, to have an estate for life in the third part of the lands and tenements of which the husband was solely seised either in deed or in law, or in which he had a right of entry, at any time during the marriage, of a legal or equitable estate of inheritance in possession, which the issue of the husband and wife (if any) might by possibility inherit.

The particular lands and hereditaments to be held in dower must be assigned by the heir of the husband, or his guardian, by metes and bounds if divisible, otherwise specially, as of the third presentation to a benefice, &c. If the heir or his guardian do not assign, or assign unfairly, the widow has her remedy at law, and the sheriff is appointed to assign her dower; or the widow may enforce her rights by bill in equity, which is now the usual remedy.

A woman is barred of her dower by the attainder of her husband for treason, by her own attainder for treason or felony, by divorce à vinculo matrimonii, by elopement from her husband and living with her adulterer, by detaining the title-deeds from the heir at law, until she restores them, and by alienation of the lands assigned her for a greater estate than she has in them. By the 3 & 4 Will. IV. c. 105, it is provided that no woman shall be entitled to dower out of any lands absolutely disposed of by her husband either in his life or by will, and that his debts and engagements shall be valid and effectual as against the right of the widow to dower. And further, any declaration by the husband, either by deed or will, that the dower of his wife shall be subjected to any restrictions, or that she shall not have any dower, shall be effectual. It is also provided that a simple devise of real estate to the wife by the husband shall, unless a contrary intention be expressed, operate in bar of her dower. This statute however affects only marriages contracted, and only deeds, &c., subsequent to the 1st of January, 1834.

DOWLETABAD, a strongly fortified town in the province of Aurungabad, 7 miles W.N.W. from the city of Aurungabad, in 19° 57′ N. lat., and 75° 15′ E. long. The fort consists of an enormous insulated mass of granite, standing a mile and a half from any hill, and rising to the height of 500 feet. The rock is surrounded by a deep ditch, across which there is only one passage, which will allow no more than two persons to go abreast. The passage into the fort is cut out of the solid rock, and can be entered by only one person at a time in a stooping posture. From this entrance the passage, still cut through the rock and very narrow, winds upwards. In the course of this passage are several doors by which it is obstructed, and the place is altogether so strong, that a very small number of persons within the fort might bid defiance to a numerous army. On the other hand, the fort might be invested by a very inconsiderable force, so as effectually to prevent any supplies being received by the garrison, who, owing to the intricacy of the outlet, could never make an effective sally. The rock is well supplied with tanks of water. Since the seat of government has been transferred to Aurungabad, the town of Dowletabad has greatly decayed, and only a small portion of it is now inhabited. It is included in the territory of the Nizam of Hyderabad.

DOWN, the fine hair of plants, is a cellular expansion of the cuticle, consisting of attenuated thin semitransparent hairs, either simple or jointed end to end, or even branched, as in the Mullein. When attached to seeds, it enables them to be buoyed up in the air and transported from place to place.

DOWN, a county of Ireland, in the province of Ulster, is bounded N. by Antrim and Belfast Lough, E. and S. by the Irish Channel and Carlingford Bay, and W. by Armagh. The greatest length, N.E. and S.W., is 51 miles. The greatest breadth, N.W. and S.E., is 38 miles. The area is 967 square miles, or 612,495 acres, of which 514,180 are arable, 78,317 uncultivated, 14,355 in plantations, 2211 in towns, and 3432 under water. The population in 1841 was 361,446, of whom 323,807 were in the rural district, and 37,639 in the civic district.

Down forms the south-eastern extremity of Ulster. The surface of nearly all the county is undulating; but the only uncultivated district is that occupied by the Mourne Mountains and the detached group of Slieve Croob. The highest mountain in the county is Slieve Donard, 2796 feet. There are about a dozen other mountains exceeding 1000 feet in height. With the exception of the two mountain groups, the numerous hills which diversify the surface are seldom too high for arable cultivation, and the irregularity of the surface facilitates drainage, and likewise affords a shelter, which, from the scarcity of timber in some parts of the county, is of material advantage.

Beginning the coast line at Belfast Lough [BELFAST], there is a small quay for fishing and pleasure boats at Cultra; then a small harbour and pier at Bangor; next a little harbour at Grooms-

port; and next beyond this the town and harbour of Donaghadee; in front of which lie three islands called the Copelands, on one of which is a light-house. South from Donaghadee the coast is low, rocky, and dangerous: there are small fishing stations at Ballywalter, Ballyhalbert, Cloghy, and Newcastle, and a lighthouse on Kilwarlin rock. South from Newcastle is Tara Bay, much frequented by fishing vessels; and near this is the deep inlet of Strangford Lough. The Lough is connected with the sea by a very narrow channel five miles long by about one in breadth, across which is a ferry from Strangford to Portaferry. The Lough contains many islands, and several good anchorages and landing quays. After passing the small harbour of Ardglass, we arrive at the large Bay of Dundrum, which extends about 10 miles across by 3 or 4 in width. This Bay is exposed, shallow, and full of quicksands, which have occasioned vast loss to shipping. The Great Britain steam-ship was stranded in Dundrum Bay from Sept. 1846 to August 1847. A few small boat-harbours intervene between Dundrum Bay and Carlingford Bay, which is an extensive inlet running 8 miles inland to Newry, and bounded by steep mountains on each side. There are anchorages within the bay at Carlingford, Rosstrevor, and Warren's Point.

With the exception of the Upper Bann, all the rivers of Down discharge their waters into the Irish Channel. The chief of them are the Lagan, the Ballynahinch or Annacloy river, which widens into the Quoile, and the Newry river. The Lagan navigation is an artificial water-communication from Lough Neagh to Belfast Lough. The Newry Canal establishes a water communication between Lough Neagh and Carlingford Bay.

Down is well supplied with roads. Portions of the Ulster, the Belfast and County Down, the Dublin and Belfast Junction, and the Newry and Rosstrevor Railways, will, if carried out in accordance with the acts obtained, pass through this county.

The vicinity of the sea prevents the continuance of frosts on the east and south; and the insulated position of the mountainous tract confines the heavier mists and rains to that part of the county where their effects are least felt. The general inequality of the ground carries off surface waters and prevents damps, so that the climate, although somewhat cold, is considered very wholesome. The prevailing winds in spring are from the east.

The chief geological features are strongly marked. The Mourne and Slieve Croob groups consist of granite. Northward and eastward of the granite district the whole of the remainder of the county is occupied by an extension of the transition series which forms the southern basin of Lough Neagh. Clay slate in greater or less degrees of induration is the prevalent rock. Towards the sea on the north-east and east slate quarries are common. Near Moira is a little of the tertiary limestone; and isolated portions of limestone occur in other spots. A little copper, lead, and coal have been met with in the county. Chalybeate springs occur at various places.

The prevalent soil in the low district is a stony loam. Clayey soils are confined to the north-east of the county and the barony of Ards, and are of a strong and productive quality, but they are wet and require a large quantity of manure. The richest soil in the county is in the district of Lecale. Alluvial tracts are frequent, and yield luxuriant crops of grass without manure. The bogs in general are not larger than is advantageous for purposes of turbary. Moory land is confined to the mountain district. Considerable quantities of wheat are raised thoughout the county, but chiefly along both shores of Strangford Lough; oats and barley are the chief produce of the south and centre of the county. Sea-weed is the chief manure in the E. and N.E. districts, and marl in the S. and S.E. The system of farming is in general very good. The acreage of land under crop in 1847 was as follows:—Corn, 210,657 acres; beans, 3865; potatoes, 13,741; turnips, 21,579; flax, 5950; meadow and clover, 31,926; other crops, 4410—total under crop, 292,131 acres. The principal live stock reared in the county consists of pigs.

The linen manufacture is the staple trade of Down, and gives employment to a greater number of operatives, in proportion to the population, than in any other part of Ireland. It has been estimated that the linen trade gives employment, in various ways, to 10,000 persons in the county. Much of the flax employed is grown in the county; and seed for this flax is imported from Flanders. Machine-spun yarn is now mostly used for the warp-thread of linen, but hand-spun yarn is preferred for the weft. The weaving is mostly done in cottages, by persons who devote a part of their time also to farming. There are about a dozen towns in Downshire where linen markets are held. The bleaching of the woven linen is a large branch of manufacture, conducted in bleach fields on the banks of the river Bann. The remaining articles of manufacture in the county are chiefly muslin, leather, salt, glass, and vitriol. The fisheries on the coast are rather extensive. The chief exports of the county are shipped at Belfast and Newry.

Divisions, Towns, &c.—The county of Down is divided into 10 baronies, which include about 70 parishes. It is in the diocese of Down, Connor, and Dromore. The county returns 2 members to parliament, and one member each for Downpatrick and Newry; in all 4 members. The assizes are held at Downpatrick.

The following are the principal towns, with the population of each in 1841:—

Ardglass is a small seaport town, 6½ miles S. from Downpatrick. It is largely engaged in fishery, and has a good many smacks and yawls, besides a few sloops. The town has been much improved, and is frequented in summer as a bathing place. Population, 1066.

Ballymacarret. [BELFAST.]

Banbridge is a thriving town on the north-eastern bank of the Upper Bann, which has become in recent times the chief seat of trade for the linen manufacture of the district. The town is neat and well arranged, with many good houses and shops, a parish church, two Presbyterian

meeting-houses, and one Methodist meeting-house, a handsome market-house, and a union workhouse in the vicinity. Population 3324.

Bangor is situated on Bangor Bay, a small inlet from Belfast Lough. It had once a large abbey, which was founded in the sixth century. The cotton manufacture is carried on to a considerable extent in the town and neighbourhood, and a little business is done in the linen manufacture. There are places of worship for churchmen and dissenters, several schools, and some charitable institutions. A pier was erected at Bangor some years ago, with a view to the encouragement of the deep sea fishery. Population, 3116.

Donaghadee, situated on the southern side of Belfast Lough, is a government packet station, 22 miles from Portpatrick, on the opposite coast of Scotland. A large pier and a lighthouse, both of recent erection, have much improved the harbour, and added considerably to the import and export trade of the town. There are several places of worship and schools. Population, 3151.

Downpatrick, a parliamentary borough and the assize town of the county of Down, is situated in a valley near the south-western angle of Strangford Lough. It consists chiefly of four main streets, which meet near its centre. It contains the cathedral of the diocese, a parish church, a Roman Catholic chapel, 2 Presbyterian chapels, and 3 Methodist chapels, the county court-house, county prison, the diocesan school of the diocese, a union workhouse, an infirmary, a fever hospital, and barracks. A small export trade is carried on by means of vessels of 100 tons, which can come up to Quoile Quay, one mile from the town. The borough returns one member to the House of Commons. Population, 4651.

Dromore, formerly the seat of a bishop, is a small town on the north bank of the Lagan. It contains a cathedral church, a Roman Catholic chapel, and 2 Presbyterian chapels. Population, 2110. The bishopric of Dromore is now incorporated with the sees of Down and Connor, thus forming the bishopric of Down, Connor, and Dromore. [BISHOPRIC.]

Newry, a parliamentary borough, is situated on the confines of the counties of Down and Armagh, on both sides of the Newry Water, which divides the two counties, and separates the town into two parts, of which the larger part is in the county of Down. Newry is 6 miles from Warren Point, the head of Carlingford Bay, to which vessels of the largest size can sail, and whence smaller vessels sail by the Newry Water and ship canal to Newry, whilst the Newry Canal extends the navigation for barges into Lough Neagh. In the export of agricultural produce Newry ranks next to Belfast, and the imports are very considerable. Steamers sail regularly to Liverpool and Glasgow, and many vessels trade to America, the Baltic, the Levant, and various parts of England. Besides flour and oatmeal mills, there are various manufactures carried on connected with ship-building, and the retail trade of the town is extensive. The ancient part of the town is badly built, but the modern part contains good streets and houses. There are 2 churches, 2 Roman Catholic chapels, and several meeting-houses. There is a union workhouse, and there are municipal offices, hospitals, and numerous schools. Population, in Down, 8898; in Armagh, 3073. Newry returns one member to the House of Commons.

Newtownards is situated near the bottom of Strangford Lough, 10¼ miles E. from Belfast. It is a very neat, well-arranged, and well-built town. The chief manufacture is muslin-weaving, and numerous females are employed in embroidery for the Glasgow merchants. The town has an extensive retail trade. There is a small court-house, a town-hall, a handsome church, and several places of worship for dissenters, chiefly Presbyterians. Population, 7621.

Portaferry is situated on the northern side of the entrance to Strangford Lough. It consists chiefly of three streets and a range of houses along the quay. Considerable quantities of agricultural produce are exported from Portaferry to Glasgow and Liverpool, whence coals, timber, iron, and other articles are imported. Population, 2107.

Rathfriland is about 9 miles N.E. by E. from Newry, on a hill down which the streets radiate to the five public roads leading from different points to the town. The town contains some good houses, and carries on a little trade in the manufacture of linen. Population, 2183.

History and Antiquities.—Before and for some time after the coming of the English, Down was known as Ulladh or Ulidia, the original of the name of Ulster. The ancient inhabitants are supposed to have been the Voluntii of Ptolemæus. The north-eastern portion of Down was at an early period occupied by the Picts. This region abounds with stone-circles, cromlechs, and subterranean galleries, which usually mark the presence of this peculiar people.

The presence of St. Patrick in this county in the 6th century is attested by authentic records, and can be traced with topographical exactness at the present day. Downpatrick, Saul, Dromore, Morville, and Bangor, are the chief ecclesiastical foundations of Patrick and his immediate successors. Newry Abbey was established in 1153. The county was overrun by the English in 1177. In 1333 the Irish overturned the English rule in Ulster, expelled many of the Anglo-Norman families, and remained supreme in the county for more than two centuries. During the 16th and 17th centuries, by deaths, conquests, and confiscations, the crown gradually acquired power over the whole county.

Of the Pagan antiquities of Down, the most remarkable is a stone cromlech, inclosed by a circular ditch of extraordinary dimensions, called the Giant's Ring, near Lisburn. The inclosure is nearly half an English mile in circumference; and the rampart is still from 12 to 14 feet in height. There are stone monuments of the same character at Sliddeny Ford, near Dundrum, and Legaraney in the parish of Drumgoolan. There is a remarkable cairn, or sepulchral pile of stones, on the top of Slieve Croob. Along the Armagh boundary of Down there extends a great earthen rampart, called by the people of the country the Danes

Cast, and sometimes Tyrone's Ditches. There are numerous raths or earthen entrenched mounds throughout Down, of which the most remarkable are at Downpatrick, Donaghadee, and Dromore. Of the Anglo-Norman military antiquities of Down, the castle of Dundrum is the most important. It is imposingly situated on a rock over the bay, and consists of a circular keep with numerous outworks, which underwent many sieges between the 14th and 17th centuries. There are other military and castellated remains at Mourne, Newcastle, Castlewallen, Rathfriland, Ardglass, Killileagh, Ardquin, Portaferry, Bangor, and Hillsborough.

The chief ecclesiastical remains in Down are at Downpatrick, where there are the ruins of the cathedral, and of three other religious houses. There is a round tower at Drumbo, near Belfast. At Grayabbey there is still standing in good preservation a part of the ancient abbey founded here in 1192 by Africa, daughter of the king of Man, and wife of De Courcy. Near Downpatrick at the base of Slieve-na-Griddle are the wells of Struel, or as they are sometimes called St. Patrick's Wells, to which Roman Catholic pilgrimages are made every Midsummer.

(Harris's *History of Down; Statistical Survey of Down;* Cox's *History of Ireland;* Inglis's *Ireland in* 1834; *Parliamentary Papers.*)

DOWNING COLLEGE, CAMBRIDGE, was founded by Sir George Downing, Bart., of Gamlingay Park, in Cambridgeshire, who by will dated 20th December, 1717, devised estates in the counties of Cambridge, Bedford, and Suffolk, first to Sir Jacob Gerard Downing, and afterwards to other relations in succession, and in failure thereof, to build and found a college in this university. The college was founded by charter, Sept. 22, 1800, the statutes were framed in 1805; and a piece of land having been purchased, the first stone of the college buildings was laid May 18, 1807; since which time the building has proceeded at intervals, at an expense of more than 60,000*l*. In 1821, buildings sufficient for opening the college, and comprising nearly two sides of a large court, having been completed, undergraduates were admitted to reside and keep terms.

This college will consist of a Master, two Professors (one of Laws of England and one of Medicine), sixteen Fellows (two of whom only are clerical), and six scholars. At present only the Master, Professors, and three Fellows, are appointed, for the purpose of taking possession of the estates, administering the revenues, superintending the building of the college, and for the other necessary purposes. The appointment of the remaining fellows is reserved until after the erection of the buildings necessary for the college. The scholars will also be elected after that period; but not more than two in each year. There are also two chaplains nominated by the Master.

The Master is elected by the archbishops of Canterbury and York, and the masters of St. John's College and Clare Hall, from among those who have been professors or fellows. The electors to the professorships are the same as to the mastership, with the addition of the master. The electors to the fellowships are, the Master, Professors, and Fellows of the degree of M.A. While the college remains uncompleted, the elections to fellowships are at uncertain times, depending upon vacancies. The clerical fellowships are to be tenable for life; the lay fellowships to continue only for twelve years. The number of members upon the boards of the college in 1848 was 60.

(Ackermann's *History of the University of Cambridge*, 4to, Lond. 1815; *Cambridge Univ. Calendar* for 1848.)

DOWNPATRICK. [DOWN.]

DOWNTON. [WILTSHIRE.]

DOXOLOGY, the name of a form of giving glory to God, applied to the concluding paragraph of the Lord's Prayer, 'Thine is the kingdom, and the power, and the glory,' which is left out of many of the ancient copies of St. Matthew's Gospel, and entirely in that of St. Luke. Doxology is also used for the short hymn, *Gloria Patri*, which is used in our church service at the end of every psalm.

DRABA, a genus of plants belonging to the natural order *Cruciferæ*. *D. verna*, Common Whitlow-Grass, is an exceedingly common plant, ornamenting old walls and dry banks in the spring, before other flowers make their appearance. It is found throughout Europe, and is most abundant in Great Britain. It is the *Erophila verna* of De Candolle. *D. aizoon*, Evergreen Whitlow-Grass, is a native of Bavaria, Austria, Hungary, Transylvania, and the Carpathian mountains, particularly on Mount Choesz. *D. aizoides* is a native of gravelly soils in almost every country of Europe. It is a rare plant in Great Britain, and has been found on rocks and walls at Pennard Castle, near Swansea. (Babington, *Manual;* Don, *Gardener's Dictionary.*)

DRACÆNA, a genus of endogenous plants, of the natural family *Asparageæ*. The genus was established by Linnæus, and named from one of its species yielding the resinous exudation, familiarly known by the name of Dragon's Blood, a translation of the Arabic name *dum al akhwain*, met with in Avicenna and other Arabian authors.

The species of Dracæna are now about 30 in number, and found in the warm parts of the Old World, and in many of both Asiatic and African islands, whence they extend southwards to the Cape of Good Hope and New Holland, and northwards into China, and to the eastern parts of India, as the districts of Silhet and Chittagong. Species are also found in Socotra, and the Canary and Cape Verd Islands, as well as at Sierra Leone. From this distribution it is evident that the species require artificial heat for their cultivation in England. They are found to thrive in a light loam, and may be grown from cuttings sunk in a bark bed.

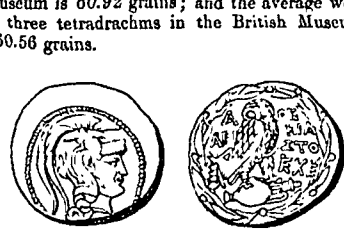
Of the several species of Dracæna which have been described by botanists, there are few which are of much importance either for their useful or ornamental properties. Among them however may be mentioned *D. terminalis*, a species rather extensively diffused. The root is said by Rumphius to be employed as a demulcent in cases of diarrhœa, and the plant as a signal of truth and

of peace in the Eastern Archipelago. In the Islands of the Pacific Ocean a sweetish juice is expressed from its roots, and afterwards reduced by evaporation to a sugar, of which specimens were brought to Paris by Captain D'Urville from the island of Otaheite. The root is there called Ti or Tii, and thence no doubt corrupted into *Tea-Root* by the English and Americans. M. Gaudichaud mentions that, in the Sandwich Islands generally, an intoxicating drink is prepared from this root, as well as from the roots of *Piper methysticum*.

Dracæna Draco is the best known species, not only from its producing Dragon's Blood, but also from one specimen having so frequently been described or noticed in the works of visitors to the Canary Islands. The most celebrated specimen of this tree grows near the town of Orotava, in the Island of Teneriffe, and was found by Humboldt in 1799 to be about 45 feet in circumference. Sir G. Staunton had previously stated it to be 12 feet in diameter at the height of 10 feet; and Ledru gave even larger dimensions. The great size of this enormous vegetable is mentioned in many of the older authors; indeed, as early as the time of Bethencourt, or in 1402, it is described as large and as hollow as it is now; whence, from the slowness of growth of Dracænas, has been inferred the great antiquity of a tree which four centuries have so little changed.

DRACHM, or DRAM. There are two drachms or drams remaining in our system of weights; the first is the sixteenth part of the ounce, which is the sixteenth part of the pound avoirdupois of 7000 grains. In the national standard, the troy pound of 5760 grains, there is no dram; but this weight occurs in that particular division of the troy pound which is used by apothecaries, in which the dram is the eighth part of the ounce, which is the twelfth part of the pound of 5760 grains.

DRACHMA, a Greek word, *drachme* (δραχμη), a silver coin. It was the chief coin in use among the Athenians. The didrachm, or two drachms, the tridrachm, or three drachms, and the tetradrachm, or four drachms, were its multiples. The last was the largest form of Greek silver. The average weight of five drachmæ in the British Museum is 60.92 grains; and the average weight of three tetradrachms in the British Museum is 260.56 grains.



Drachma. British Museum. Silver. Actual Size.

DRACI'NA, or *draconin*, the colouring matter of Dragon's Blood. It is of a fine red colour, and very fusible; it may be worked between the fingers, and drawn into threads. It melts at about 130°.

DRACO (the Dragon), one of the old constellations, referred by Hyginus to the fable of the Hesperides. It is constantly stated by the older writers as being placed between Ursa Major and Ursa Minor, which hardly suits the present position of the constellation, since its principal stars are all contained between Ursa Minor, Cepheus, Cygnus, and Hercules. The two stars in the head (β and γ, the latter celebrated as passing very near the zenith of the south of England, and as being the one used in the discovery of aberration) are nearly in the line joining α Cygni (Deneb) and Arcturus; while seven or eight smaller stars wind round Ursa Minor in such a manner as to render the name of the constellation not inappropriate. The extreme star (λ) is very nearly between the pole-star and its pointers.

DRACO, an Athenian legislator, who was living in 621 B.C. Suidas says that he brought forward his code of laws in this year, and that he was then an old man. Aristotle says ('Polit.' ii. at the end), that Draco adapted his laws to the existing constitution, and that they contained nothing peculiar beyond the severity of their penalties, which, in many cases, were death. On the legislation of Draco in general, see Wachsmuth, *Hellenische Alterthumskunde*, ii. 1, p. 239, &c.

DRACONTIUM (from δρακων, a snake, because the stem is mottled like the skin of a serpent), a genus of plants belonging to the natural order *Araceæ*. *D. polyphyllum* has a tuber resembling a small cake, producing one or two leaves, with long clouded spotted petioles, resembling the skin of a snake. It smells so powerfully on first expanding, that persons have been known to faint from the stench. It is also said to excite the nerves of hearing, and even induce a state of catalepsy. It is a native of Guiana, Surinam, and other parts of equinoctial America, where it is called Labarri, and regarded as a remedy against the bite of the Labarri snake, which its spotted leaf-stalks resemble in colour. The *Dracontium fœtidum* of Linnæus, the Skunk-Weed and Skunk-Cabbage of the United States, is now referred to the genus *Symplocarpus*.

DRAGOMANS, or DROGOMANS (from the Turkish *Trukéman*): the interpreters attached to the European consulates and embassies in the Levant are so called. At Constantinople they are the chief and in most cases the sole medium of communication between Christian ambassadors who are ignorant of the Turkish language and the Ottoman Porte. They are men born in the country, and are chiefly descended from old Genoese or Venetian settlers.

DRAGON, *Draco*, the formidable name of a genus of small arboreal lizards, distinguished by having a winglike expansion of skin along their sides, supported by the six anterior false ribs, which are slender, and extend outwards, stretching the membrane at the will of the animal. By means of this parachute, these creatures are enabled to skim from branch to branch, like flying squirrels, with great ease, but they cannot beat the air as the bat does. Below the throat hangs a long pointed dewlap, supported by a stylet of the os hyoïdes. On each side of the

neck is a fold of skin, and there is generally a small cervical crest. The limbs are long; the thighs destitute of pores; the tail is long and slender; the tongue thick and rounded; the skin is covered with small imbricated scales, of which those of the limbs and tail are carinated. In their habits these little sweeping lizards are arboreal, and search among the leaves and in the crevices of the bark of trees for insects. They are prompt in their actions. Several species are known, natives of India, Java, Sumatra, Timor, Manilla, &c. See *Erpétologie; Suites à Buffon.*

DRAGON'S BLOOD. [CALAMUS; DRACÆNA.]

DRAGONET. [CALLIONYMUS.]

DRAGOON. [CAVALRY.]

DRAGUIGNAN, the capital of the French department of Var, stands on the river Artubie, 490 miles S.E. from Paris, in 43° 32′ N. lat., 6° 28′ E. long., and has 8588 inhabitants. The town is situated in a fertile plain surrounded by an amphitheatre of hills covered with vines and olive-trees. It is tolerably well built, ornamented with numerous fountains and many rows of trees, and traversed by a canal from the Artubie, which moves the machinery of several factories. The chief buildings are—the court-house; the prison; the clock tower, which is built on the summit of a high rock; and the hospital. The inhabitants manufacture coarse woollens, soap, olive oil, leather, stockings, silks, wax-candles, and earthenware. The environs produce excellent fruit and wines. The town has tribunals of first instance and of commerce, a college, a library, a cabinet of medals, a museum of natural history, and a botanic garden rich in exotic plants and beautifully laid out.

DRAIN. [SEWERS.]

DRAINING. As a certain quantity of moisture is essential to vegetation, so an excess of it is highly detrimental. In the removal of this excess consists the art of draining, which presents three principal features:—1. To drain land which is flooded by water coming over it from a higher level, and having no adequate outlet below. 2. To drain land where springs rise to the surface, and where there are no natural channels for the water to run off. 3. To drain land which is wet from its impervious nature, and where the evaporation is not sufficient to carry off all the water.

The first branch includes all those extensive operations where large tracts of land are reclaimed by means of embankments, canals, sluices, and tunnels. Such works are generally undertaken by associations under the sanction of the government, or by the government itself: the BEDFORD LEVEL is an example of them. In Switzerland many marshes have been laid dry by tunnelling through solid rocky obstructions; and in Holland vast tracts are protected from flooding by embankments.

Where the land is below the level of the sea at high-water, it requires a constant removal of the water which percolates through the banks or accumulates by rains; and this can only be effected by sluices and mills, as is the case in the fens in England. The water is collected in numerous ditches and canals, and led to the points where it can most conveniently be discharged over the banks. In hilly countries it sometimes happens that the waters which run down the slopes of the hills collect in the bottoms where there is no outlet, and where the soil is impervious. In that case, it may sometimes be laid dry by cutting a sufficient channel all round, to intercept the waters as they flow down, and to carry them over or through the lowest part of the surrounding barrier. In draining a great extent of land, it is often necessary to widen and deepen rivers, and alter their course; and not unfrequently the water cannot be let off without being carried by means of tunnels under the bed of some river, the level of which is above that of the land.

The draining of land which is rendered wet by springs arising from under the soil is a branch of more general application. The object is to find the readiest channels by which the superfluous water may be carried off; and for this purpose an accurate knowledge of the strata through which the springs rise is indispensable. Abundant springs which flow continually generally proceed from the outbreaking of some porous stratum in which the waters were confined, or through natural crevices in rocks or impervious earth; and these, as well as land-springs, are traced by geological means. Wherever water springs, there must be a pervious and an impervious stratum to cause it, and the water either runs over the impervious surface, or rises through the crevices in it. When the line of the springs is found, the obvious remedy is to cut a channel with a sufficient declivity to take off the water in a direction across this line, and sunk through the porous soil at the surface into the lower impervious earth. The place for this channel is where the porous soil is the shallowest above the breaking out, so as to require the least depth of drain, but the solid stratum must be reached, or the draining will be imperfect. When there is a great variation in the soil, and it is difficult to find any main line of springs, it is best to proceed experimentally by boring in various parts; whereby it will generally be easy to ascertain whence the water arises, and how it may be let off. When the drains cannot be carried to a sufficient depth to take the water out of the porous stratum, it is often useful to bore numerous holes with an auger in the bottom of the drain through the stiffer soil, and the water will either rise through these bores into the drains and be carried off, or it will sink down through them if it lies above. This method is often advantageous in the draining of peat mosses. If the soil, whatever be its nature, can be drained to a certain depth, it is of no consequence what water may be lodged below it. It is only when it rises so as to stagnate about the roots of plants that it is hurtful.

The third branch in the art of draining is by far the most expensive operation, in consequence of the number of drains required to lay the surface dry, and the necessity of filling them with porous substances, through which the surface water can penetrate. There is often a layer of light earth immediately over a substratum of clay, and after continued rains this soil becomes filled

with water, like a sponge, and no healthy vegetation can take place. In this case numerous drains must be made in the subsoil, and over the draining tiles or bushes which may be laid at the bottom of the drains loose gravel or broken stones must be laid to within a foot of the surface, so that the plough shall not reach them. The water will gradually sink into these drains, and be carried off, and the loose wet soil will become firm and dry. The slope of the field and the fall which can be obtained for the drains, their size and depth below the surface, the angles at which they intersect each other, and their number — all are circumstances which require the drainer's best attention. In draining clay land, where there is only a layer of a few inches of loose soil over a solid clay which the plough never stirs, the drains need not be deeper than two feet in the solid clay, nor wider than they can be made without the sides falling in. The common draining tile, which is a flat tile bent in the form of half a cylinder, is the best for extensive surface draining. In solid clay it requires no flat tile under it; it is merely an arch to carry the loose stones or earth with which the drain is filled up. In grass land the sod may be laid over the drain, after it has been filled up so as to form a slight ridge over it. Sometimes a drain is covered with a sod, without any tile whatever; and at other times a twisted rope of straw is thrust into the drain. Draining tiles are now made of various shapes and sizes.

As the draining of wet clay soils is the only means by which they can be rendered profitable as arable land, and the expense is great, various instruments and ploughs have been contrived to diminish manual labour and expedite the work. Among these are the common mole-plough, the draining-plough, Smith's subsoil-plough, tapering-spades, and hollow-spades.

(For more detailed information, see the works of Elkington, Stephens, Johnson, Donaldson, Young, Marshall, and Smith.)

DRAKE, SIR FRANCIS, was born in or about the year 1546, in Devonshire. His father, who was exposed to some persecution as a Protestant during the reign of Mary, retired with his family to Kent, was ordained, and became vicar of Upnor, on the Medway, near Chatham. Francis thus grew up among sailors; and while he was yet very young, was apprenticed to a neighbour, the master of a bark, who carried on a coasting trade, and sometimes made voyages to Zeeland and France. This man, on his death, having no children of his own, bequeathed to young Drake the bark and its equipments. Drake however soon sold his ship, and embarked himself and his fortunes in Sir John Hawkins's last and unfortunate adventure to the Spanish Main. Drake lost all his property, but acquired a character for skill and courage, having brought safe home the bark which he commanded, a vessel of 50 tons. Desirous of revenging himself upon the Spaniards, and being joined by a number of sea adventurers, who mustered among them money enough to fit out a vessel, Drake made two or three voyages to the West Indies, to gain intelligence and learn the navigation of those parts; but Camden adds, that he also got some store of money there, 'by playing the seaman and the pirate.' In 1570 he obtained a regular commission from Queen Elizabeth, and cruised to some purpose in the West Indies. In 1572 he sailed again for the Spanish Main, with the Pasha, of 70 tons, and the Swan, of 25 tons, the united crews of which amounted to 73 men and boys. He was joined off the coast of South America by another bark, from the Isle of Wight, with 38 men; and with this insignificant force he took and plundered the town of Nombre de Dios, and made great spoil among the Spanish shipping.

After some extraordinary adventures, Drake returned to England, with his frail barks absolutely loaded and crammed with treasure and plundered merchandise; and on the 9th of August, 1573, anchored at Plymouth.

Drake was employed for a time in the service of the queen in Ireland; but in 1577, under the secret sanction of Queen Elizabeth, he departed on another marauding expedition, taking with him five vessels, the largest of which was of 100 and the smallest of 15 tons. The united crews of this miniature fleet amounted to 164 men, *gentlemen* and sailors. After many adventures along the coasts of the South American continent, where some of his attacks were completely successful, Drake, on August 20, reached Cape Virgenes, and sailed through the Strait of Magalhaens, being the third navigator who performed that passage. On the 17th day, after making Cape Virgenes, he cleared the strait, and entered the Pacific or South Sea. Having obtained an immense booty by plundering the Spanish towns on the coast of Chili and Peru, and by taking, among many other vessels, a royal galleon called the Cacafuego, richly laden with plate, he sailed to the north in the hope of finding a passage back to the Atlantic a little above California. After reaching 48° N. lat., the severity of the cold induced him to alter his intentions, and he determined to follow the example of Magalhaens, and steer across the Pacific for the Moluccas. He thence reached Plymouth by Java and the Cape of Good Hope, on September 26, 1579, having circumnavigated the globe, and spent many months on the almost unknown south-western coasts of America. Drake was most graciously received at court, and Elizabeth partook of a banquet on board the vessel, and there knighted the captain. During part of the year 1585, and the whole of 1586, Drake was actively employed against Philip II. on the coasts of Spain and Portugal, in the Canaries, the Cape de Verdes, the West India Islands, and on the coast of South America, where Carthagena and other towns were taken and plundered.

In 1587, when formidable preparations were making in the Spanish ports for the invasion of England, Elizabeth appointed Drake to the command of a fleet equipped for the purpose of destroying the enemy's ships in their own harbours, which service was very effectively performed. He destroyed four castles, and a great number of vessels of all sorts on the coast from Cadiz to the Tagus, and this he called 'singeing the king of

Spain's beard.' These operations delayed the sailing of the armament more than a year, and gave Elizabeth time to prepare for her defence. "Having thus performed the public service, Drake bore away to the Azores, on the look-out for the treasure ships from India, and he was so fortunate as to fall in with an immense carrack most richly laden. He took it of course, and he generously spent a considerable part of his prize-money in supplying the town of Plymouth with good fresh water, for hitherto there was none, except what the inhabitants fetched from a miles distance.

His next service at sea was as vice-admiral in the fleet under Charles Lord Howard of Effingham, lord high admiral of England, which, with the assistance of the elements, scattered and destroyed the 'Invincible Armada' of Spain. [ARMADA.] The seamanship of Drake, Hawkins, and Frobisher, contributed largely to the happy result. In the following year, 1589, Drake was employed as admiral in an unsuccessful expedition sent to Portugal to support the claims of Antonio, a pretender, against the sovereignty assumed by the Spaniards. In 1595, Drake and Sir John Hawkins, with a land force under the orders of Sir Thomas Baskerville and Sir Nicholas Clifford, were sent with 26 ships to attack the Spaniards in the West Indies. When they got among the West India Islands Drake and Hawkins quarrelled, and before reaching the east end of Puerto Rico Hawkins died. Drake attacked Puerto Rico, and was defeated. Sailing away, he took and burned Rio de la Hacha, Rancheria, Santa Martha, and Nombre de Dios; but gained little booty. Drake remained in the harbour of Nombre de Dios, while Baskerville made a vain and ruinous attempt to cross the isthmus of Darien. A fatal disease broke out among the soldiers and sailors, and many of his men and three of his captains died. Drake himself fell sick, and expired on December 27, 1595, in sight of Puerto Bello, which he had formerly taken and plundered.

DRAKENBORCH, ARNOLD, was born at Utrecht, in 1684, studied in that university under Grævius and Peter Burmann, and at the age of 20 wrote an elaborate dissertation 'De Præfectis Urbis,' which established his reputation as a scholar.

This valuable little work of Drakenborch has gone through several editions; that of Baireuth, 1787, contains an extract from the author's funeral oration, by Professor Oosterdyk, in which the other works of Drakenborch are mentioned. Upon leaving Utrecht he went to Leyden to study the law, but there also he devoted his chief attention to the classical lessons of Perizonius and Gronovius. He wrote, in 1707, another dissertation 'De Officio Præfectorum Prætorio.'

Drakenborch undertook, by the advice of Peter Burmann, an edition of Silius Italicus, which appeared in 1717. On Burmann's removal to Leyden, Drakenborch succeeded him in the chair of eloquence and history at Utrecht. His edition of Livy, on which he bestowed much time and labour, was published in 1738-46, in 7 vols. 4to. He died at Utrecht in 1747.

DRAMATIC ART AND LITERATURE.

The dramatic art is that art which exhibits human actions by means of language and theatrical representation. As the communication of individuals with one another by speech is one of the most ordinary modes of human activity, and is necessary for the existence of society, it follows that the language of the drama, a term which means an action, must be dialogue. In reading a written dialogue, we supply by imagination the persons of the speakers, and the accessories, such as dress and place; but in the theatrical drama we have the persons represented by living actors, in appropriate dress, and surrounded by such scenic representation as gives some idea of the country and of the age in which the drama, or action, is supposed to take place. The language of the drama may be poetical, in the ordinary sense of that term, as distinguished from the language of common life, or it may be the ordinary language of life. The character of the drama, and, in some degree, its adaptation for theatrical representation, will indeed depend on the language, but viewed simply as a dramatic composition, the poetical or non-poetical form of the language is unessential. It is not so easy to define what human actions, or what connected series of human actions, are adapted for dramatic purposes, that is, for representation on the stage; for if the dialogue is so far detached from action as to be capable of no further representation than that of two or more persons expressing in conversation that which is written, there is no drama in the sense of the term which we are now considering. In order to fix the attention of a great number of spectators, there must be some action which commands the sympathies of all, some series of events in which human passions are developed, some catastrophe or end, which is so connected with the preceding events as to be in the nature of a consequence, possible or probable; and the whole must be comprehended within such limits of time that the audience may not be wearied. For entertainment, some pleasurable sensation, though it may be mingled with pain, is essential to make dramatic representation successful.

The distinction of the drama into tragic and comic, or the representation of human suffering and violent passion, and the representation of love intrigues, ludicrous adventures, laughable positions, the follies and little incidents of domestic life, is not an essential distinction. The drama, whether tragic or comic, is still human life under some aspect. The immediate purpose of the representation is to please by the exhibition of something which all can understand, all, though in different degrees, can sympathise with. The ultimate purpose, as of all literary efforts and of all art, is moral; to exalt, to purify, and to correct. The dramatist who best fulfils the end of his intellectual activity, is not absorbed in his own feelings, from which he must detach himself as much as possible; he must renounce his own individuality, in order to contemplate the individuality of others, and the modes in which human beings act when they come in contact with each other. It is true that he whose intellectual and moral constitution is not both comprehensive and

varied, can have little knowledge of, and less sympathy with, the universal mind and passions of man, and cannot therefore view them as dramatic objects; but it is no less true, that he must be able to look on others out of himself, and use his own understanding and passions as a key to the interpretation of the diversified scenes of human activity.

The taste for dramatic representation is universal, though the representation itself may be varied infinitely, and some nations perhaps have never had any thing to which we can give the name of a drama. We cannot therefore attribute the invention of the drama to any one nation. That of the Hindoos is quite independent of the drama of the Greeks. But as European civilization must be traced back to that of Greece and Rome, so the drama of modern Europe has its ultimate origin in the dramatic literature of Greece and Rome, though it may be true that the mysteries and moralities of the middle ages have their peculiar character, and may be said to have originated in the religious opinions and habits of the age; yet the later Greeks had their religious dramas also, written at least, and probably acted too.

Ancient Drama.—The drama of the Greeks originated in religious celebrations. In the form in which we know it, the Greek drama consisted of two parts, a dialogue, which corresponds to the modern drama, and a chorus, which was lyrical rather than dramatic. The lyric element is not entirely absent in the modern drama, but, except in such compositions as are pure imitations of the Greek, it plays a more subordinate and a different part. As the dialogue in the perfected Greek drama was recited, while the chorus was sung, it is supposed that we must assign to the two elements an independent origin. The ultimate origin of the Greek drama, according to Aristotle ('Poet.' iv. 14), was the recitation of the dithyrambic poems. The dithyrambus was apparently the earliest species of choral poetry, and it was connected with the worship of Bacchus; it was a poetical recitation, and an exhibition or representation, though it wanted some of the characteristics of the drama as subsequently established. The matter of the dithyrambus was, as we may assume, the adventures of Bacchus, with such poetical decoration as was suited to the subject. Thespis, an Athenian, is said to have introduced a person or actor who was distinct from those who figured in the dithyrambic chorus, and either carried on some dialogue with them, or told some story in the intervals of the lyric song. A distinction between tragedy and comedy, among the earliest Greeks, can scarcely have existed, for there could be no distinction in that which was yet unformed. That which the Greeks subsequently distinguished as comedy from tragedy is said to have originated in Sicily, and to have received its perfection from Epicharmus; but this can only mean that Sicily had a genuine comedy of its own creation. The Attic comedy cannot be supposed to have been derived from the Sicilian, for Athens had a drama of its own, and an original one. Athenian tragedy, as we know it, was founded on the old mythological and semi-historical traditions of Greece, such as the tale of Troy, and the heroes of the Trojan war: it rarely took for its subjects contemporary events, though there are instances of such subjects being used for dramatic purposes, as the 'Capture of Miletus,' by Phrynichus, and the 'Persians' of Æschylus, which was a dramatization of the great victory obtained over Xerxes and his fleet by the Greeks, in the battle of Salamis, B.C. 480. The Athenian dramas were represented at fixed times, at the Dionysia [DIONYSIA], or festivals of Dionysus or Bacchus. Thus the origin of the drama was indicated by the religious celebrations with which it was connected.

Æschylus, the oldest Athenian dramatist who is extant, may also be considered the parent of the Attic drama. He made the dialogue an essential part by introducing several persons or actors, independent of the chorus. But in Æschylus the chorus still performs an important part of the drama, for its songs are essentially interwoven with the progress of the action; and if they were omitted, there would be a defect in the continuity, and a want of completeness in the events by which the catastrophe and all that precedes it are combined into one consistent unity. The same remark is applicable, to some extent, to the choruses of Sophocles and Euripides, but they are less intimately and necessarily connected with the progress of the dramatic action than the choruses of Æschylus. The drama of Sophocles is a less simple or more artful construction than that of Æschylus: the chorus is not so closely connected with the dialogue, that is, with the dramatic action; there are more personages, or actors, a greater variety of incidents, and more complication in the events; the language is less inflated, and approaches nearer to the language of common life. Yet the poetical character of the Greek drama was always retained even in the dialogue, which is generally iambic verse, and sometimes trochaic. The form of the iambic verse was the nearest approach to the language of common life that could be made; it is a form which the Greek language very easily assumes, and while it satisfied the poetical conditions of the drama, and conformed to its primitive poetical origin, it was well adapted for the real purpose of the drama, that is, action, or the representation of action. [ÆSCHYLUS; SOPHOCLES.]

The peculiar character of the third great extant tragedian of Athens, Euripides, is properly considered in another place [EURIPIDES]; and also the Satyric Drama.

We know little of old Greek comedy, except from the plays of Aristophanes, though he was not the earliest of the Athenian comic writers. Here also the dress is poetic: the actors speak in iambic verse, but with more freedom than was allowed in the tragic iambic, for the subject neither required nor admitted the stately and somewhat constrained step of the tragic muse. The chorus also played its part in the plays of Aristophanes, and sometimes broke out into lyric effusions half serious and half comic. That part of the choral address to the spectators which was called the Parábasis, was in fact an address of the poet to

his audience, which had sometimes little connection with the incidents of the piece. The merits and defects of Aristophanes, the lively comic writer, brilliant wit, and political satirist, can only be correctly estimated by reference to his age and his audience; and by a careful and unprejudiced study of the original, and of the people before whom these comedies were represented. So much genuine wit, good sense, satire, gross obscenity, and personal abuse, merited and unmerited, were never before or since thrown before a mingled audience, which must indeed have been very different from audiences of modern times, both to appreciate and tolerate these indescribable performances. [ARISTOPHANES.]

A little before B.C. 400, the licence of the old comedy was checked by positive law, and it was forbidden to represent living persons on the stage, as Aristophanes had done in the case of Cleon, Socrates, and others, or to use masks which resembled them. There may have been other causes besides this which brought about the decline of the old comedy and the establishment of the new. The new comedy reigned from about B.C. 400 to a period somewhat later than the death of Alexander, and yet of the immense number of plays produced during this period nothing remains except scattered fragments. The Roman plays of Plautus and Terence, both of whom founded their dramas on Attic originals, enable us to form some estimate of the character of the new comedy. Diphilus, Philemon, Apollodorus, and Menander, were the chief writers of the new comedy.

The Roman comedy of Plautus, and the later comedy of Terence, being founded on the new comedy, may be taken as general evidence of its character. The Italians had indeed a native drama, and the 'Fabulæ Atellanæ,' said to be of Oscan origin, were domiciliated at Rome. Livius Andronicus, above five hundred years after the assumed epoch of the foundation of Rome, is said to have set the first example of imitating the Greek drama. Of the Roman tragic drama we have no examples, for the tragedies of Seneca were neither adapted nor intended for acting. Of their comedy we have the extant plays of Plautus and Terence, which, though both framed on a Greek model, differ very considerably from one another. There is more wit and coarse merriment in Plautus, in which he may have improved on his Greek models Diphilus and Philemon. His language is often exaggerated, and too much encumbered with bad jokes and plays upon words. Yet many of the pieces of Plautus have great merit: the 'Captivi' is perhaps one of the best examples. The plays of Terence have not the broad mirth of Plautus, but more delicacy, both of thought and expression, and are probably much nearer to his models, Apollodorus and Menander, than Plautus was to his originals. C. Julius Cæsar, an excellent judge of style, called Terence a half Menander, by which expression a compliment was intended. The Phormio of Terence, perhaps his best play, is a favourable example of a Greek play skilfully adapted by a Roman artist. [PLAUTUS; TERENCE.]

The Roman tragic writers, Livius Andronicus, Nævius, and Ennius, were followed by Pacuvius and Attius, all of whom however followed Greek originals. But there is not a single tragedy of any of these writers extant, and we can only judge of them by fragments. One of these fragments from the 'Prometheus Loosed' of Attius has great merit. The tragedies of Pacuvius and Attius long kept their place on the stage, and were acted in the time of Cæsar, and even later. There were other tragic writers in the time of Augustus, as Asinius Pollio, and Ovid, who wrote a tragedy of 'Medea,' which was probably founded on the original of Euripides.

The Modern Drama is treated of in connection with the *Literature* of the countries to which it respectively belongs. [FRANCE; GREAT BRITAIN; GERMANY; ITALY; SPAIN.]

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DRAMMEN, a seaport town of Norway, situated on the river Dram, which here enters the Drammenfiord, in the gulph of Christiania, stands in 59° 39′ N. lat., 10° 28′ E. long., and has about 8000 inhabitants. The town is divided into three quarters; Bragnaes on the northern, and Stroemsoe and Tangen on the southern bank of the river: these are united by a handsome bridge. Bragnaes consists of a row of houses about a mile in length. The principal trade consists in the export of timber and iron. Leather, tobacco, oil, sail-cloth, &c., are manufactured. Ship-building is carried on. The harbour has depth sufficient to allow vessels to lie alongside the quays. In 1842, 548 vessels (372 of which were Norwegian and in ballast) arrived, tonnage 92,641; in the same year the departures were 654 (including 461 Norwegian with timber), tonnage 108,961. The imports are salt, coals, wine, spirits, colonial produce, and manufactured goods.

DRAVE, a river of Austria, which, rising in the Pusterthal, near Innichen, in the western part of the Tyrol, flows S.E. to Villach in Carinthia, whence it runs E. as far as Marburg in Styria: below this its course is S.E. along the northern border of Croatia and Sclavonia, which it separates from Hungary, until it falls into the Danube, from the right bank, about 13 miles below Eszeck. The whole length of the Drave is about 450 miles. It becomes navigable at Villach. Its tributaries are the Mur, which joins it at Legrad, the Gail, the Gurk, Glan, Lavant, &c. The valley of the Drave, above Warasdin in Croatia, is narrow and hemmed in by high mountains, which in a few places, as at Seidlich and Kossig, approach within a few hundred feet of each other. In this part the current is very rapid, but from Warasdin the river flows sluggishly through a level country, forms swamps in many places, and occasionally inundates the low country. Gold-dust is found in this river. The lower part of its course is navigated by steamers.

DRAWBACK is a term used to signify the sum paid back on the re-exportation of goods, on the importation of which an equal sum has already been paid as duty. A drawback is also allowed on the exportation of articles which are subject to excise duties. The object of this repayment is to enable the exporter to sell his

goods in foreign markets unburthened with duties; and it is clear that if duties are required to be paid on the first importation, no transit trade can possibly be carried on unless drawback is allowed by the government. Drawback is also allowed, in a few cases, upon articles used within the kingdom, such as that on timber used in the construction of places of public worship, or in mines.

DRAWBRIDGE, a bridge used in ancient castles and in modern fortresses over a ditch or fosse, and capable of being raised up at one end so as to cut off the means of access. Drawbridges are usually formed of boards nailed to a frame constituting a platform, which is furnished at one end with hinges fastened to a beam placed parallel to one end of the frame. The bridge is raised by means of chains passed through the masonry of the gate, and these chains are worked either by wheels or by hand.

DRAWING, in its strict meaning, is the art of representing objects on a flat surface by lines describing their forms and contours alone, independently of colour or even shadow, although the latter is closely allied with drawing, both in practice and in theory. Alluring as colour is to the eye, and principal as it seems to be in painting, it is really subordinate to drawing, because unless assisted by form, it is nearly valueless and unmeaning, and incapable of expressing any thing; whereas form can distinctly represent objects without the aid of colouring, or even that of shadow, which latter is the adjunct and ally of the other two, being governed by both, inasmuch as form determines the position of shadows, and colouring their proper tone and hue.

Although drawing embraces all objects and their forms, in its more restricted technical sense it is generally understood to imply the drawing of the human figure, as that species of it which is the most scientific in itself and the most important in art. In order to attain to a complete mastery of the human figure, which after all is to be regarded only as the means to a higher aim, and the mechanical apparatus for effecting it, it is necessary to commence by studying what is tedious in itself, and seems almost foreign to the artist's purpose, namely, the internal configuration of the human frame. It is not enough to understand the proportions of the body and limbs, with the form and situation of the external muscles, but it is necessary that all the muscles, their purposes and functions, should be well understood; nor must osteology, or the bones of the skeleton, be neglected. Indeed it is desirable that the artist should be able to draw the skeleton figure in any attitude, by which his figures will always be well put together. Without scientific knowledge of muscular action, the painter will be able to give his figures only attitudes, and those not always correct, should he have occasion to represent such as from their nature do not admit of being copied from the life. Unless, besides possessing a complete knowledge of the human body and the action of the limbs and muscles, he is also able to express the emotions of the mind, and that not as lives in the countenance alone, ide, and the whole frame, he will at the best produce only clever academical figures, skilfully drawn, but devoid of soul and sentiment. He must therefore endeavour to make himself master of expression, in the most comprehensive meaning of that very arduous and complex study, which, be it observed, depends entirely upon drawing and truth of delineation. For this purpose such works may be recommended as Bell's 'Anatomy of Expression.

Perspective, which is generally treated of separately, and is therefore ordinarily considered a distinct study, is nevertheless a most essential part of drawing—in fact, its very grammar, all objects being subject to its laws, although they do not admit of being delineated according to the processes employed for drawing buildings, furniture, and such things as consist of strict geometrical forms.

Drawing, as far as regards facility in delineating common forms and objects so as to enable a person to describe them promptly with the pencil, ought to be considered nearly as indispensable a part of education as writing itself. By this, such a degree of proficiency is meant as would enable a person either to express or explain his ideas upon paper, or to sketch from nature.

There are various manipulations or modes of drawing, distinguished according to the materials or implements made use of, such as chalk, black lead pencil, sepia or other tinted drawings, which last-mentioned class are sometimes called washed drawings, in which some indication of colouring is occasionally introduced. But what is termed water-colour drawing, as now practised, is altogether a species of painting, although the process is totally different from that of oil colours, or even distemper. Pen and ink drawings in the style of etchings, either with or without the addition of wash of shadow, are capable of producing considerable effect.

Painters' drawings or studies, such as those of the old masters, are highly valuable, because they often exhibit their first conceptions in all their energy, and admit us to immediate intercourse, as it were, with their ideas as they arose in their minds.

The invention of Lithography has been applied with great success to making fac-similes of such drawings; it also enables artists to make drawings at once upon stone, from which impressions may afterwards be taken that are equivalent to autograph delineations.

DRAWING-FRAME. [Cotton-Spinning.]

DRAYTON, MICHAEL, was born at Hartshill, in Warwickshire, in 1563. Little is known with certainty of his early life. It is supposed that he went to the University of Oxford, but without taking any degree, and also that he was in the army at an early period of life. His earliest work was published in 1593, under the title of the 'Shepherd's Garland;' it was afterwards revised and reprinted in 1619, under the name of 'Eclogues.' Shortly after the 'Shepherd's Garland' appeared his long historical poems, 'The Barons' Wars,' 'England's Heroical Epistles,' &c. His 'Polyolbion,' a descriptive poem on England, her natural productions, and

legends, made its appearance in 1613. In 1626 Drayton was poet-laureate. He died in 1631.

The merits of Drayton as a poet are truly great. His historical poems have about them a heavy magnificence; the most gorgeous images and the boldest descriptions follow in stately array, clothed in well-turned and appropriate verse, but unfortunately the obscurity of the diction renders them exceedingly unattractive. The same observations will apply to the 'Polyolbion,' which is an immense mass of good sterling matter. 'The Wars of the Barons' are written in ottava rima. Drayton has left one work which, in its way, has never been surpassed—a short fairy poem, called 'Nymphidia.' A more elfin work than this could not be penned: the author has contrived to throw himself into the feelings of the diminutive beings whom he represents. Had Drayton written nothing but 'Nymphidia,' he would deserve immortality.

Drayton has a monument in Poets' Corner, Westminster Abbey.

DREBBEL, CORNELIUS VAN, was born at Alkmaar, in Holland, in 1572. He is chiefly distinguished by being the inventor of the thermometer; or, at least, by sharing that honour with Santorio: he also discovered the means of producing a bright scarlet dye for woollens and silks. The process was afterwards introduced into France by the persons who established the Gobelines manufacture, the products of which were celebrated for the brilliancy of their scarlets. It has been asserted that he was the inventor of the telescope and microscope; but this is probably without foundation, though he may have made some improvements on those instruments.

Drebbel spent some part of his life in England, and he died in London in 1634. His principal work is a tract, in Dutch, on the nature of the Elements, Winds, Rain, &c.

DREDGING-MACHINES are employed for clearing away deposited matter from the beds of rivers, canals, harbours, and basins. Some machines for this purpose may be compared to harrows or shovels, which loosen the deposit, preparatory to its removal either by the action of the tide or by sluicing. But, for the most part, they remove as well as loosen the deposit. The spoon dredging machine consists of a strong hoop of iron, about two feet in diameter, attached to a pole thirty or forty feet long, and carrying a large bag of perforated bullock's hide. This apparatus is connected by ropes with a barge, from the side of which it is let down and manœuvred in such a manner that the edge of the hoop cuts into the soft bottom, and scoops a large quantity of silt into the bag, which is then drawn up to the surface. The bucket dredging-machine is a long massive framework with a wheel at each end, over which a series of endless chains is placed; so that by turning one of the wheels the whole chain is set in motion. Attached to the chain is a series of perforated iron buckets. By means of tackle the bucket-frame is let down until it reaches the bottom, when, the steam-engine being set to work, the chain of buckets begins to perform its circuit, by which every bucket is, in succession, made to scoop up a quantity of silt, which it carries up to the top of the oblique frame, and pours out its contents into a barge.

DRENTHE, a province in the kingdom of Holland, is bounded N. by Groningen, E. by Hanover, S. by Overyssel, and W. by Friesland. It lies between 52° 35′ and 53° 12′ N. lat., 6° 5′ and 7° 5′ E. long.: its greatest length from N. to S. is 50 miles, from E. to W. also 50 miles; but the area is not in proportion with these measures, being only 1880 square miles. The population in 1838 was 70,271, which gives only 38.4 to the square mile. From this last circumstance it may be inferred that the general character of the soil is bad. In fact, ont of the 658,648 acres which the province contains, only 338,221 are capable of cultivation; 317,580 consist of heaths, bogs, and marshes; the remainder being covered with canals, brooks, roads, and buildings. Agriculture, pasturage, and digging and exporting peat, form the chief employment of the population. The province lies on each slope of the watershed between the Zuider-Zee and Dollart's Bay. Several small streams rise in it; the most important of them is the Haventer-Aa, along part of which the canal from Meppel to Assen runs. There are no towns in the province. *Assen*, the capital, is a village of 1800 inhabitants, 16 miles S. from the city of Groningen. *Hoeverden*, a strong fortress in the south of the province, stands on a feeder of the Vecht, and has a population of 2,200. The pauper colonies of Fredericksoord and Willemsoord, on the western border of the province, which were established in 1818, are well worthy of more consideration than they have received. An account of the system pursued in these establishments is given in the first volume of Mr. Macgregor's *Commercial Statistics*, from which some of the statements in this article are taken.

DRESDEN, the capital of the kingdom of Saxony, is situated on both sides of the Elbe, in 51° 3′ N. lat., and 13° 44′ E. long. The fine plain in which it stands is bounded by many beautiful ranges of hills. The city is divided into three parts: the Altstadt, the Neustadt, and Friedrichs-stadt; in addition to which there are several suburbs. The space gained by levelling the fortifications in the years 1810 and 1817 has been appropriated to gardens, promenades, and buildings. The population is about 70,000.

Dresden contains 11 gates or entrances. There are about 20 churches and chapels, of which the majority are Lutheran. In the Altstadt (the Old Town), the most interesting structure is the royal palace: it is an irregular building in the gothic style, with a church which has the highest tower and steeple in the town. The celebrated Grüne-Gewölbe (green vaults) open upon the palace-yard, and contain a costly collection of precious stones, pearls, and works of art in gold, silver, amber, and ivory, which have been gradually accumulated by successive monarchs. Close to the palace are—the chancery building, the depository for the national archives, and the Stallgebäude (mews), in which there are four noble collections in art, namely, an armoury, a

gallery of arms, a cabinet of casts and models, and a picture gallery. This gallery is one of the finest in Europe, and contains upwards of 1200 choice pictures. Near this building stands the Zwinger Palace, in which are—a handsome chapel, a gallery of portraits, a porcelain cabinet, a library of 10,000 volumes, and cabinet of engravings. The square adjoining it is called the Zwinger; three sides of it are occupied by six pavilions connected by a gallery. The six pavilions contain—a museum of natural history; a cabinet of engravings; a collection of mathematical and philosophical instruments; a collection of works of art in ivory, alabaster, silver, iron, wood, &c.; a chamber of models useful in hydrography, mining, military architecture, &c.; and a miscellaneous cabinet. The other buildings of note in the Old Town are—the Brühl Palace, containing a choice collection of Meissen porcelain; the Academy of Arts; School of Design, and Gallery of Duplicates; the Mint; the Arsenal; the Medical and Surgical School; the Town Hall; the Trades' Hall; the Botanical Garden; the German Theatre; the Post Office; the Treasury; the Observatory; the Mews and Riding School; the Military Hospital; the Orphan Asylum; and several churches, two of which have steeples exceeding 300 feet in height.

Three suburbs are connected with the Old Town: the Pirna, See, and Wildsruf suburbs. Near the Pirna suburb is the Great Garden, which is nearly five miles in circuit; and to the right lies the Nursery of Fruit Trees, which contains upwards of 65,000 plants. From the Wildsruf suburb an avenue called the Ostra-Allee extends to a massive bridge across the Weiseritz, which leads to the Friedrichs-stadt, between which and the Elbe are the wooded grounds called the Ostra-Gehege.

The access from the Old Town to the New Town is by a bridge of 16 arches, which is 1420 feet long. The bridge opens upon a square or platz, planted with linden-trees; from this extends a broad street, lined with linden-trees. Here is situated the Japanese Palace or Augusteum, which is the depository of four choice collections—the Cabinet of Antiquities; the Cabinet of Coins; the Cabinet of Porcelain; and the Royal Public Library, containing 220,000 volumes. Besides this large palace, the new town contains barracks, a town hall, the Cadet Academy and Engineers' School, a house of industry, baths, a theatre, a cemetery, and other buildings and open places.

Dresden contains a high school, and a large number of other educational establishments. There are a variety of learned and other sócieties, the chief of which are the Academy of Arts, the Society of Economy, the Mineralogical, the Natural History and Medical, the Bible, the Missionary, and the Saxon Antiquities societies. Dresden has no external trade or manufactures of much importance. It is a place of transit for colonial and other foreign produce from Magdeburg, Hamburg, &c., and has six general fairs. Its mechanics have obtained some note in Germany for [illegible] of mathematical, mechanical, and [illegible]s, engraving on steel and stone, the making of gloves, carpets, turnery ware, jewellery, straw hats, painters' colours, &c. These mechanics are incorporated into 60 fraternities. Morocco and other leather, refined sugar, tobacco, white lead, tin ware, glass, stockings, cotton goods, &c., are also manufactured. In 1845 Dresden suffered much from an inundation, occasioned by the swelling of the Elbe in consequence of the melting of an unusual quantity of snow in the mountains south of the city.

DREUX, an ancient town in the department of Eure-et-Loir, in France, stands on the Blaise, 41 miles W. from Paris, in 48° 44′ N. lat., 1° 22′ E. long., and has 6367 inhabitants. It is partly surrounded by the Blaise, which here divides into several branches, and enters the Eure a short distance N. of the town.

Dreux stands in a pleasant country, and is pretty well built. On a hill which commands the town are the remains of the ancient castle of the counts of Dreux. On the site of these ruins, stands the magnificent chapel built by Louis Philippe whilst duke of Orléans, and greatly enlarged and beautified by him during his reign. It was intended to be the final resting place of the members of his family, and does contain the remains of the duke and duchess of Penthièvre, the count of Toulouse, the princess de Lamballe, the duchess of Orléans, the ex-king's mother, the Princess Mary, the duke of Orléans, and the Princess Adélaide. An enormous brick tower, said to be the keep of the old castle abovementioned, is now used as a telegraph establishment. The town-hall and the parish church are handsome gothic structures. The inhabitants manufacture serges, hosiery, and other woollen goods, they also trade in sheep and cattle. There are tan-yards, iron-foundries, and dye-houses in the town, which has tribunals of first instance and of commerce, a college, and a good hospital.

DREVET, PIERRE, the name of two French engravers, father and son. The father was born at Lyon in 1664; and, says Watelet, but for his son, who surpassed him, would have been the best portrait-engraver of his own or any previous time. He died at Paris in 1739.

Pierre Drevet, the son, was born at Paris in 1697. In his thirteenth year he executed a plate of the Resurrection of Christ, after J. Audré, which is equal to the works of any of his contemporaries. In his twenty-sixth year he produced his masterpiece, the full-length portrait of Bossuet, after Rigaud, executed with such truth and delicacy, that the substance and material of every object is easily and clearly distinguished—flesh, draperies, wood, the various ornaments—all have a peculiar and characteristic style of execution. Some of his last works are executed in a freer style. He engraved exclusively after French masters. His works are not numerous. He died at Paris in the same year as his father, 1739.

DRILL. [BORING.]

DRILLING is a mode of sowing by which the seed is deposited in regular equidistant rows, at such a depth as each kind requires for its most perfect vegetation. It has been practised by gardeners from time immemorial, and from the garden

it has gradually extended to the field. Though it has not realized the over-sanguine expectations of some agriculturists, the advantage of sowing the seeds in rows or drills has stood the test of experience; and the drill husbandry, by combining the advantages of continued tillage with those of manure and a judicious rotation of crops, is a decided improvement on the old methods of sowing all seeds broadcast. The crops which are now most generally drilled are potatoes, turnips, beans, peas, beet-root, cole-seed, and carrots; and in general all plants which require room to spread, whether above or under the ground. The distance between the rows in these crops is generally such as to allow the use of a light plough or horse-hoe to be drawn by a horse between them. The most common distance is twenty-seven inches. The Northumberland mode of cultivating turnips, which is adopted by most scientific farmers, consists in placing the manure in rows immediately under the line in which the seed is to be drilled, and keeping the intervals in a mellow and pulverised state by repeated stirring.

The instrument used for sowing seeds in single rows is sometimes a small light wheel-barrow, which a man pushes before him; hence called a drill-barrow. It has a box in which the seed is put, with a slide to regulate the quantity. This is allowed to fall on a wooden or metal cylinder below. In the circumference of this cylinder are several cavities where the seed lodges, and is carried down into a tin funnel below; the remainder is prevented from falling through by small brushes in which the cylinder turns. The motion is communicated from the wheel which runs on the ground to the cylinder by means of a chain and pulleys. The improved drills, of which there are many patented varieties, are complex but very efficient machines, which sow several rows at once.

In some districts there is still a prejudice against the use of the drill even for turnips. In Norfolk, where the corn is usually drilled, the turnips are still very generally sown broad-cast. On light friable soils, drilling the seed is very generally adopted. There is a neatness in the appearance which recommends it to the eye; and machines have been so improved, that the seed is sown more regularly and is better covered than it could possibly be by the best broad-cast sower followed by the harrows. In very stiff heavy soils, and in moist seasons, it is not so practicable to use the drill. In poor sandy and gravelly soils, where bones have been found of so great advantage as a manure, drilling is the only mode by which the bones and the seed can be sown in contact with each other, an important circumstance. When the ground has been well prepared and laid into stitches of a convenient width, a whole stitch may be drilled at once, with so much regularity, that an instrument with as many hoes as there are drills, and of the same width, may be drawn over the land to stir all the intervals, without danger of injuring the plants. This requires great practice and attention; but it may be considered as the perfection of the drill system. Where drilling seed is generally adopted, and the farms are not so large as to make it prudent for the occupier to purchase expensive instruments, drilling has become a separate profession. An industrious man with a small capital buys improved drills, and undertakes to drill the seed at a certain price per acre. The farmer finds horses and seed, and the driller finds the machine, and attends to the management of it himself. Corn is generally drilled at the distance of eight or nine inches; and a machine which drills twelve rows will cover a stitch ten feet wide. Some prefer the rows to be nearer, but in that case the hoeing is not so easily performed with a machine, and it is done by hand.

DRIMYS. [WINTERA.]

DRIN, Rivers. [ALBANIA.]

DROGHEDA, a county of a town, municipal borough, parliamentary borough, and port, in the province of Leinster, in Ireland, is situated between the counties of Louth and Meath, on both sides of the Boyne, 4 miles from the sea, and 29 miles N. from Dublin.

The population of the county of the town in 1841 was 19,260, but 2909 were in the rural district, which has been formed into baronies, and transferred to the adjoining counties of Louth and Meath. The population of the town is 16,251. The æstuary of the Boyne is navigable for vessels of 250 tons from the sea to the bridge of Drogheda. The modern part of the town is tolerably well built, but contains no fine streets, and few public buildings worthy of notice as works of architecture. The streets and lanes in many of the older parts are very narrow, and in some parts very dirty. The town contains — a mansion-house, tholsel, town-prison, linen-hall, custom-house, union workhouse, barracks, 3 churches, 2 Roman Catholic chapels, one of which is considered the cathedral of the archbishopric of Armagh, 3 friaries, 2 nunneries, a Presbyterian chapel, and a Methodist chapel. Among the ancient buildings are—the ruins of St. Mary's church, of a Dominican abbey, and St. Laurence's Gate, which is a fragment of the walls which formerly surrounded the town. Assizes, quarter-sessions, and petty-sessions are held in the town. There are iron foundries, cotton spinning-mills, 3 flax spinning-mills, 6 corn-mills, 5 salt works, 8 tanneries, 4 soap works, and 2 breweries. Drogheda carries on a considerable trade, particularly in grain. Vessels of 250 tons can discharge at the quay, and goods are carried inland by the Boyne navigation, in barges of 50 tons, to Navan. There are 5 steamers which ply constantly between Drogheda and Liverpool. The number of vessels registered Jan. 1, 1848, was 45 (4752 tons). The Dublin and Drogheda Railway was opened in 1844. The municipal borough is divided into three wards, and is governed by 6 aldermen (of whom one is mayor) and 18 councillors. Population in 1841, 16,621. The parliamentary borough returns one member to the House of Commons.

Drogheda has been a place of note for its ecclesiastical establishments from an early period, and its political history has been of interest since 1220, when Henry III. retained it in his own

possession out of a renewed grant to Walter de Lacy, down to the battle of the Boyne, which took place in 1690, about 2½ miles above the town.

DROHOBYEZ. [GALIZIA.]

DROITS OF ADMIRALTY are the perquisites attached to the office of Admiral of England (or Lord High Admiral), the powers of which office are now vested in the Board of Admiralty, the last Lord High Admiral having been the Duke of Clarence, afterwards Wm. IV. Of these perquisites the most valuable is the right to the property of an enemy seized on the breaking out of hostilities. Whatever Droits of Admiralty accrue are now paid into the Exchequer for the use of the public.

DROITWICH. [WORCESTERSHIRE.]

DRÔME, a department in the south-east of France, formed out of a portion of Bas-Dauphiné, is bounded N. and N.E. by the department of Isère, E. by that of Hautes-Alpes, S. by those of Basses-Alpes and Vaucluse, and W. by that of Ardèche. It extends from 44° 9′ to 45° 20′ N. lat., and from 4° 38′ to 5° 45′ E. long.: its greatest length from N. to S. is about 80 miles, from E. to W. 50 miles. The area is 2523 square miles, and the population in 1841 was 311,551, which gives 123.48 to the square mile, being 44.52 below the average per square mile for all France.

The department forms an inclined plane which slopes from E. to W. About one-third of the surface consists of a sandy plain running N. and S. along the Rhône, with a breadth of 5 to 8 miles. The rest of the department is mountainous. From a secondary chain of the Alps, which runs along the eastern boundary, numerous offshoots extend westward, gradually diminishing in height as they advance in that direction, and finally subsiding into the valley of the Rhône. The highest of these masses is more than 5000 feet above the sea; but the general elevation of the ridges is not much above 3000 feet. Their summits, which are everywhere accessible, yield good pasturage in the summer and autumn, and at these seasons they are frequented by the migratory flocks of the neighbouring departments; their sides are covered with dense forests of pine, oak, beech, cochineal-oak, &c. The valleys between these mountain ridges, which are the chief haunts of the population, communicate with each other by narrow dangerous by-roads, and are furrowed by rivers or mountain torrents that frequently cause great losses by their overflow. The facilities for irrigation are very great, and this mode of culture is extensively adopted, especially in the valley of the Rhône, the fertility of which is in a great measure owing to the skilful employment of the system of irrigation. The air is pure and healthy. The high mountains are covered with snow during several months of the year; but in the valleys, and along the Rhône, the heat in summer is intense. North and south winds alternately prevail, the former bringing dry weather, the latter rain.

The Isère, which divides this department from that of Ardèche, is navigated by steamers, and receives all the rivers of the department, which are here briefly described proceeding from north to south. The Galaure, which rises in the department of Isère, crosses the north of the department, and enters the Rhône at St.-Vallier. The Isère, remarkable for its deep, black waters, and the magnificent views which its valley presents, receives in this department the Herbasse, and joins the Rhône a few miles N. of Valence: it is navigable. [ISÈRE.] The Veoure has its whole length in the department, and flows S.W. into the Rhône past Chabeuil. The Drôme, which gives name to the department, rises on the confines of Hautes-Alpes, and flows in a rapid stream N.W. as far as Die, receiving the Bes on the right bank; from Die to Pontaix its course is nearly due W., and from the last-mentioned town it runs S. to its junction with the Rohanne on the left bank, whence it flows W. to the Rhône, which it enters below Livron after a course of 66 miles. A good deal of loose timber is floated down this river as far as Pontaix, above which its bed is very rocky; here the timber is made into rafts and floated on to the Rhône. No part of the Drôme is navigable. The next river to the south is the Roubion, which is joined by the Jabron at Montélimart, just before its entrance into the Rhône. The Lez forms part of the southern boundary, and flowing S.W. enters the Rhône in the department of Vaucluse. The Eygues rises in the south-east of the department, and passes Nyons, below which it enters Vaucluse, and joins the Rhône a little W. of Orange. The Ouvèze rises in the extreme south of the department, and passing Le-Buis enters Vaucluse on its way to join the Sorgues.

The department contains 1,615,004 acres, distributed among 91,364 proprietors, and into 1,020,279 parcels. Of this area, 408,067 acres are covered with woods and forests; 354,269 with heath and moor land; 640,265 acres are capable of cultivation; 41,364 are natural pasture land, and 59,272 are under vines. Corn sufficient for the consumption is not produced; maize, buckwheat, and haricot beans are the chief crops. The olive, the walnut, the almond, the chestnut, and other fruit trees, are cultivated with success. The mulberry tree is extensively grown for the production of silk; the first crop of leaves serves to rear the silk-worms, and the second is given to cattle. The number of mulberry trees in the department in 1835 (and it was then on the increase) was 2,850,000, and in the same year 466,100 lbs. of raw silk were produced. The culture of the vine is an object of great attention in the valley of the Rhône, and in the arrondissements of Die and Nyons. The annual produce of wine is 8,580,000 gallons, a large portion of which is exported; the best kinds are the famous red and white wines called Hermitage, which for their mellifluous goût, colour, and perfume, rank among the best wines in the world. Black truffles of excellent quality are abundant. Horses and horned cattle are not numerous; mules are the common beasts of burthen. Sheep and pigs are reared in considerable numbers. Among the

wild animals are foxes, wolves, deer, chamois, beavers in the islands of the Rhône, otters, hares, rabbits, eagles, vultures, pheasants, partridges, &c. There is a good deal of meadow land, chiefly in the valley of the Rhône, which, by canals of irrigation, is made to yield two and three crops a year.

Several iron mines are worked; copper and lead are found; coal is met with in various districts, but only one mine is worked. Sand used in glass manufacture, chalk, plaster-of-Paris, rock crystal, alabaster, granite, potter's clay, &c., are found. There are also several mineral and salt springs. The manufacturing industry of the department is important and active. Woollen cloth, silk, hosiery, serge, cotton yarn, leather, paper, nut and olive oil, brandy, ropes, lime, tiles, bricks, &c., are manufactured; there are various dyeing and bleaching establishments; 552 wind and water mills, 5 iron smelting furnaces and foundries, 711 workshops and factories of various kinds, and most families have a magnanerie for rearing silk-worms. There is roadway accommodation by 5 royal and 5 departmental roads; the railway now in course of construction from Lyon to Avignon runs for about half its length in this department, passing through Tain, Valence, and Montélimart. There are 450 fairs held in the year.

The department is divided into 4 arrondissements, which, with their subdivisions and populations, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1841.
Valence. . .	10	101	144,146
Montélimart .	5	68	65,689
Die	9	74	66,056
Nyons . . .	4	118	35,660
Total . .	28	361	311,551

In the arrondissement of Valence, the chief town, *Valence*, the Roman *Valentia*, and the capital of the department, stands on the left bank of the Rhône (which is crossed by a fine suspension bridge), in 44° 56′ N. lat., 4° 53′ E. long., 336 miles S. by E. from Paris, and has 13,407 inhabitants. It is defended by walls and towers, and entered by several arched gateways. The streets are narrow, irregular, and ill-built; there are however some interesting structures. Among these are—the cathedral church of St. Apollinaire, which contains a monument, by Canova, of Pope Pius VI., who died at Valence (Aug. 29, 1799): a monumental structure called Le Pendentif, which stands to the north of the cathedral on ground that was once a cemetery, and consists of four pillars placed in the angles of a square, connected above by arches, and supporting a vault or roof with four sides that terminate in a point; this building is the model for such structures in France, and was the first of the kind erected: a house in the Grand Rue, the façade of which is covered with fine sculptures and florid tracery: the court-house, the barracks, the theatre, and the citadel, from which there is a fine view. The town has tribunals of first instance and of commerce, a college, school for the clergy, a school of artillery, in which Napoleon studied from 1785 to 1791, and a public library of 15,000 volumes. The chief manufactures are silk and cotton yarn, hosiery, gloves, printed cottons, silk handkerchiefs, ropes, leather, &c.; the commerce is in these articles, and in wine, brandy, fruits, raw silk, corn, olive and nut oil, hides, and paper. Steamers, which ply daily up and down the Rhône, stop at the quays in Valence. *Bourg-du-Péage* or *Péage*, on the left bank of the Isère, which separates it from Romans, owes its origin to the bridge built here in the 9th century by the monks, who had the right of toll (péage); it has 3858 inhabitants, who manufacture coarse silk, silk hats, leather, and ropes. *Chabeuil*, on the left bank of the Veoure, is an ill-built place, with 4461 inhabitants, who manufacture woollens, glove and shoe leather, and paper; there are also silk-throwing and bleaching establishments, and a college here. The town, which formerly gave title to a principality, has no object of interest except the remains of its ancient castle. *Grand-Serre*, on the Galaure, has iron and steel works, and 1588 inhabitants. *Loriol* stands at the foot of a hill on the left bank of the Drôme, opposite Livron, with which it is joined by a handsome bridge; it has 3460 inhabitants, several silk-throwing establishments, and nurseries, and trades in hides and skins. *Romans*, on the right bank of the Isère, owes its origin to the abbey founded here by St. Bernard, bishop of Vienne, in 837; it is well built in a pretty situation, and joined to Péage by the bridge before mentioned, from which there is a magnificent view of the valley of Isère, terminating eastwards in Mont Blanc, while in the opposite direction the mountains of Vivarais are visible. The town is girt by a fosse and walls which are flanked with square towers, and entered by 5 gates. The church of St.-Bernard, and the theatre which stands in the middle of a handsome promenade, called Champs-de-Mars, are the most remarkable buildings. Silk, hosiery, woollen cloth, serge, and leather, are manufactured; there are also establishments for reeling and throwing silk, lime and gypsum kilns; and the town has a good trade in wool, hemp, linen, wine, oil, black truffles, skins, &c. Romans has a tribunal and chamber of commerce, a college, ecclesiastical school, and 9471 inhabitants. There are vast mulberry plantations about this town. *St.-Donat*, on the left bank of the Herbasse, has 2223 inhabitants, who manufacture silk and tiles. *St.-Jean-en-Royans* stands in a beautiful valley, closed in by high mountains, on the right bank of the Lionne, which falls into the Bourne, a feeder of the Isère; it is a favourite place of resort with French landscape painters, on account of the romantic scenery about it. Population, 2516. *St.-Vallier*, at the junction of the Galaure with the Rhône, has 2696 inhabitants, who manufacture silk crape and twist, chemical products, pottery, beer, and leather. A little E. of this town, in a narrow savage gorge of the Galaure, are the ruins of a fine old castle, near which the

road runs in a deep cutting through rocks. *Tain*, a pretty little town 10 miles N. of Valence, on the left bank of the Rhône, stands opposite Tournon, with which it is connected by a fine suspension bridge [ARDE'CHE], and has 2459 inhabitants, who are engaged in the culture of the vine, cotton-spinning, and quarrying granite. This little town stands at the southern foot of the steep hill called Hermitage, on the craggy terraced slopes of which are the vineyards that produce the famous Hermitage wines.

In the arrondissement of Montélimart, the chief town, *Montélimart*, beautifully situated among vineyards, meadows, and mulberry plantations, is an ancient place surrounded by ramparts which are flanked with watch-towers, and entered by 4 gates facing the cardinal points. It stands near the left bank of the Rhône, at the confluence of the Roubion and the Jabron, which unite their waters at the southern gate, where they are spanned by a fine stone bridge. The town is well built; the Grande Rue, which is paved with basalt, and through which the road from Lyon to Avignon runs, is the most commercial part. Around the ramparts, both within and without, there is a fine drive formed by double rows of trees. The most imposing structure is the old castle or citadel, which overlooks the whole town. Montélimart has 8245 inhabitants, a tribunal of first instance, and a college; it is a busy manufacturing town, and has several silk and cotton factories, tanneries, tile works, and lime kilns; serge and hosiery also are made. It is famous for the manufacture of morocco leather and the almond cakes called *nougat*. Besides the articles already named, corn, flour, raw silk, walnut and olive oil, cattle, and provisions enter into the commerce of the town. From the two rivers abundant water-power is derived to drive the machinery of the several factories; and from the same source the system of canals for irrigating the grounds in the neighbourhood are filled. *Dieu-le-fit*, situated among mountains, 15 miles E. of Montélimart, is filled with a busy manufacturing population of 4163. The most remarkable building is the new Protestant church. The manufactures are woollen cloths, serge, swanskin, flannel, glass, pottery, &c.; there are also dye-houses, and establishments for spinning silk, cotton, and worsted. In the neighbourhood there are mineral springs and a large cavern which bears the name of Tom-Jones. *Grignan*, a small place of 2000 inhabitants, stands on a hill above the Lez, and was formerly famous for a magnificent château, celebrated in the letters of Madame de Sevigné, who died in it (April 18, 1696), and was buried in the parish church of Grignan. This château is now in ruins, having been burnt during the first Revolution. *Pierrelatte*, an ill-built town 13 miles S. from Montélimart, stands at the foot of a rock crowned with the ruins of an old castle, which capitulated in 1562 to the ferocious Adrets, who hurled the garrison over the battlements and massacred all [illegible] the town. The environs yield [illegible] and silk; there are silk-mills [illegible] the town, which has 3430 in-

In the arrondissement of Die, the chief town, *Die* (the *Dea Augusta* and *Dea Vocontiorum* of the Romans), stands in the middle of a fertile valley, on the right bank of the Drôme, and has 3920 inhabitants. The town, which is defended by walls flanked with numerous towers, was formerly the seat of a bishop; the old palace and former cathedral are the principal buildings. It has a tribunal of first instance, a Calvinistic chapel, manufactures of woollen cloth, silk, and cotton yarn, besides several dye-houses, fulling-mills, and magnaneries. The neighbourhood produces excellent fruits, and the delicious white wine called *clairette de Die*. *Crest*, 20 miles W. of Die, on the right bank of the Drôme, stands at the foot of a rock which has the form of a cock's crest, whence the name. It was formerly defended by a castle, which commanded the passage of the river, and rendered this one of the strongest towns in Dauphiné; only one tower of the castle now remains, which is used as a house of correction. In the church there are some fine old bas-reliefs, and an inscription which recounts the chartered privileges of the town, and is dated 1188. The town has 4948 inhabitants, who manufacture woollen and cotton cloths, serge, blankets, silk handkerchiefs, cotton yarn, paper, leather, tiles, and lime; it has also sugar refineries, fulling-mills, and dye-houses, and trades largely in truffles. *Saillans*, also on the right bank of the Drôme, is a busy manufacturing little town of 2000 inhabitants.

In the arrondissement of Nyons, the chief town, *Nyons*, or *Nions*, stands on the Eygues, at the opening of a valley which is cultivated like a garden by rills of irrigation. The town is defended by walls and towers, and entered by 4 gates; the interior is ill-built. The most remarkable object is the stone bridge over the Eygues. Soap, woollen stuffs, earthenware, spun silk, and leather, are the chief industrial products of the inhabitants, who number 3251. *Le-Buis*, an ill-built place in the valley of the Ouvèze, takes its name from the boxwood (*buis*) which abounds in its neighbourhood. Silk-throwing and the manufacture of oil and leather are the chief occupations of its 2456 inhabitants.

The department forms the see of the bishop of Valence, is included in the jurisdiction of the Cour Royale and University Academy of Grenoble, and belongs to the 7th military division, of which Lyon is head-quarters. It used to return 4 members to the Chamber of Deputies; it now returns 8 representatives to the National Assembly.

(*Dictionnaire de la France; Annuaire pour l'An* 1847; *Decree of the Provisional Government of the French Republic; Statistique de la France;* Murray's *Handbook of France.*)

DROMEDARY. [CAMEL.]

DRO'MIA (Fabricius), a genus of brachyurous decapod crustaceans (crabs) placed by M. Latreille in the section of *Notopoda*, and referred by Dr. Leach to the family of *Thalxiopoda*.

The crabs of this genus have an extensive distribution in the seas of warm climates. The Mediterranean, the Cape of Good Hope, and the Antilles, are given as localities.

The *Dromiæ* are indolent in their motions, and

live in spots where the sea is moderately deep; choosing for their habitation places where the rocks are not hidden under sand. They are almost always found covered with a species of *Alcyonium*, or with valves of conchifers, which they retain on their back by means of their four hinder feet, and which seem to serve them as a shield against their enemies. The *Alcyonia*, which are in general of the species named *Alcyonium domuncula*, continue to develop and extend themselves upon their carapace, which they at last entirely conceal. In the month of July, according to M. Risso, the females come out of a state of torpor (engourdissement) in which they ordinarily are, and betake themselves to the shallows for the purpose of depositing there a great number of eggs.—Example, *Dromia hirsutissima*, remarkable for a clothing of long red hairs.—Locality, Cape of Good Hope.

DROMORE, a bishop's see in the ecclesiastical province of Armagh in Ireland, is now incorporated with the sees of Down and Connor, thus forming the bishopric of Down, Connor, and Dromore. [BISHOPRIC.]

DRONE. [BEE.]

DRONERO. [SALUZZO.]

DRONFIELD. [DERBYSHIRE.]

DRONTE. [DODO.]

DRONTHEIM. [TRONDHIEM.]

DROPSY, *Hydrops*, a preternatural collection of watery fluid in different parts of the body. In the state of health, there is constantly poured out upon every surface, cavity, and interstice of the body, a watery fluid derived from the blood and deposited by the capillary blood-vessels. [CAPILLARY VESSELS.] This fluid does not remain long where it is deposited, but, by vessels appropriated to the office, termed absorbents, is soon taken up and reconveyed into the common circulating mass. As long as there is a perfect balance of action between these two sets of vessels, which is always the case in health, there is no accumulation of fluid, the exhalation and the absorption being always exactly equal. But if from any cause that balance be disturbed; if either the capillary blood-vessels pour out an unusual quantity of fluid, or if the absorbents fail to act with their accustomed energy, an accumulation of fluid must necessarily take place, and this accumulation, when it amounts to an appreciable quantity, constitutes the disease called dropsy.

When dropsy is the result of an increased action of the capillary blood-vessels, it is considered a primary or idiopathic disease, and constitutes the sthenic, tonic, active, or acute dropsy of authors. In this case the capillaries are conceived to be in that state, whatever it may be, which constitutes acute inflammation. The increased effusion, which constitutes the dropsy, is the result of that increased action, and by the effusion the inflamed state of the vessels is often removed. This form of dropsy occurs most frequently in the young, the plethoric, and the robust. It is induced by all the causes of inflammation, such as cold, suddenly checked perspiration, suppression of any of the natural secretions and discharges, a plethoric condition of the system, a repulsion of acute diseases of the skin, &c. It is attended with a greater or less degree of fever, the invariable concomitant of acute inflammation.

When the febrile condition of the system exists with a certain degree of intensity, it constitutes the most acute form of dropsy; but when it exists with less intensity, it gives rise to another form of the disease, termed sub-acute dropsy, in which the symptoms are the same, but less urgent. In this case there is often little or no local pain; the febrile symptoms are milder, the general uneasiness is less prominent, the skin less hot; there may be little or no thirst, and the pulse much less hard and sharp.

The third form of dropsy is that termed asthenic, or passive. It is so generally the consequence of some other morbid condition of the system that it is not usually considered a primary or idiopathic disease, but merely a sequent or ultimate result of some other pathological state. The state of the system in which it comes on is that of extreme debility, however induced; but its ordinary exciting causes have so obvious and great a tendency to exhaust the vital power, that they are usually denominated debilitating causes; such are fever, whether intermittent or continued, exanthematous or typhus, long continued and excessive evacuations, whether of natural discharges or of preternatural effusions of blood, deficient or unwholesome diet, diseases of the digestive organs, by which the due assimilation of the food is prevented, intemperance in the use of intoxicating liquors, whence drunkards of all kinds, and especially dram-drinkers, so commonly, nay, almost invariably, die of dropsy.

It is more especially this last form of dropsy which is induced by a morbid change in the constitution of the blood, namely, an increase in the proportion of its serum. An unusual quantity of water taken into the body, and not carried off by the excretory organs, may possibly give rise to such a condition of the blood. A preternatural abundance of the more fluid parts of the blood may also accumulate in the circulating mass by a suppression or diminution of the ordinary aqueous excretions. Hence the influence of a cold and moist atmosphere in inducing dropsy; and the highly important influence of diseases of the kidneys in producing the disease. It is found also that there are several diseases of the kidneys of which dropsy is the ordinary result. Moreover large abstractions of blood are frequently followed by dropsy.

The parts of the body in which the dropsical effusions usually collect are the cavities of the cranium, chest, and abdomen, and the interstices of the cellular tissue diffused over the whole body, and forming a constituent element of every organ. The dropsical fluid consists for the most part of the serum of the blood.

There are many diseases of which dropsy is the sequent, and the dropsy induced in this indirect mode is called secondary, consecutive, symptomatic, or passive, in contradistinction to its primary acute and active forms. The diseases which precede dropsy as their ordinary consequent have their principal seat in the heart and its great

vessels, in the lungs, the liver, the spleen, the kidneys, the uterus, and the ovaria. When dropsy is the consequence of disease of the heart, the signs of disease of the heart commonly long precede the appearance of the dropsy. The effusion is commonly indicated first by swelling of the face, especially beneath the eyelids, and next by swelling of the feet and ancles, and of the hands and arms, particularly of the left. As in the progress of the disease the effusion collects and accumulates in the cavity of the thorax, or in that of the pericardium, it is denoted by a peculiar train of symptoms. The respiration is always more or less embarrassed; the horizontal position uneasy, and often impossible; the pulse, which is seldom or never natural, is very variously affected.

Diseases of the coats of the great blood-vessels constituting aneurism, concretions within their cavities, or tumours of neighbouring parts, pressing upon their trunks and obstructing the passage of the blood through their canal, are frequent causes of dropsy.

Inflammation of the liver, generally of a slow or chronic nature, leading to a deposition of adventitious matter in its substance, and the consequent enlargement of the organ and the consolidation of its tissue, is a common cause of dropsy, occasioned by the obstruction to the circulation through the vena portæ, the effusion being in this case often confined to the cavity of the abdomen.

The spleen, which consists of a congeries of blood-vessels, and which is very apt to be enlarged and obstructed, may occasion effusion into the abdomen, in the same manner as disease of the liver.

The kidneys are subject both to functional and organic diseases, which are followed by effusions into all the cavities, in consequence of the failure of these organs to remove from the common mass of blood the superfluous and noxious principles which it is their office to eliminate.

Dropsical effusions are often poured into the uterus and ovaria, in consequence of primary disease in these organs; at other times tumours are formed within or attached to them, which press upon and compress the trunks of neighbouring blood-vessels, and thus occasion dropsy by a mechanical obstruction to the circulation of the blood.

Dropsy is always a formidable and often a highly dangerous disease; and there is no disease which requires a more varied treatment, because, like fever, dropsy may exist in, and be essentially connected with, diametrically opposite morbid conditions of the system. Dropsy may depend on a state of the system, for the removal of which all other remedies will be tried in vain unless their application be preceded by a decided abstraction of blood; and dropsy may depend on a state of the system in which the abstraction of the smallest quantity of blood may prove almost instantaneously fatal: in the former case stimulants and excitants invariably increase the intensity of the disease; in the latter they are indispensable to the preservation of life. On the clear discrimination of these two different states of the system, and the two different classes of disease to which they give rise, and on the sagacious detection of the different shades by which they may appear to be blended with and lost in each other, the successful treatment of dropsy mainly depends.

DROPWORT, a poisonous wild umbelliferous plant, with fleshy-fingered roots, inhabiting ditches and wet places. It has been sometimes sold fraudulently by itinerant gardeners as a new species of dahlia. Its botanical name is *Œnanthe crocata*.

DRO'SERA (from δρόσος, dew), a genus of plants belonging to the natural order *Droseraceæ*. *D. rotundifolia*, common or round-leaved Sundew, is a native of Europe, in boggy places especially. It is employed in Italy for making the liquor called *Rossoli*. It is an acrid and caustic plant. Two other species, *D. longifolia* and *D. anglica*, are natives of Great Britain. The first is a common bog-plant, but the latter is only common, in the British Islands, in Ireland. About forty species of this genus have been described. They have been found in boggy places in all parts of the world, except in the extremes of heat and cold. They are all singularly beautiful, and worthy of cultivation.

DROSERA'CEÆ, a natural order of albuminous exogenous plants, consisting of marsh herbs. There are many species of the genus *Drosera*, called in English Sundews.

DROWNING, the state of asphyxia [ASPHYXIA] produced by the immersion of the body under water. When a warm-blooded animal is immersed under water, and forcibly retained there, it immediately begins to struggle violently, and uses every effort to rise to the surface. These struggles are not at first the result of pain, but of fear. It is proved by direct experiment that the obstruction to the respiration which produces pain does not come on for some time. The point of time when the painful impediment to respiration occurs is well ascertained. In the space of three quarters of a minute a violent effort is made to inspire, to expand the lungs with air, but no air can enter. Every effort to inspire is followed by a corresponding effort to expire. At each expiration a small quantity of air is expelled from the lungs, and is seen under the surface of the water in the form of bubbles; for although the water excludes the air from entering the lung, notwithstanding the most violent efforts to inspire, yet it cannot prevent some portion of air from being expelled from the lungs by the violent efforts to expire. The ultimate result of these repeated and violent expirations is greatly to diminish the bulk of the lungs, and to bring them to the utmost degree of collapse to which it is possible to reduce them by any voluntary or instinctive efforts which the animal is capable of making.

When a human being is drowned by accident, if the fall has been from a considerable height and the water is not of very great depth, the body is precipitated to the bottom of the water; it then quickly rises to the surface, partly because the specific gravity of the body, when the lungs are full of air, is less than that of water, and partly because the body is rendered still lighter by the air, always amounting to a considerable quantity, which is collected and retained in the clothes. If the

son be not able to swim, he generally struggles violently, and probably screams; by these efforts the lungs are partly emptied of the air they contained, the comparative weight of the body is increased, and consequently it again sinks to the bottom, but it soon again rises, and this alternate rising and sinking may occur several times in succession. Whenever the body comes to the surface, and the mouth is above water, the painful impediment to respiration produces an instinctive effort to inspire, and a hurried gasp is made to obtain air. But often the mouth is not sufficiently above the surface of the water to obtain air without inspiring a quantity of water along with it; but the quantity of water received in this manner is never great, probably not more than is expelled by the cough excited by the irritation of the glottis in consequence of the contact of the water and by the subsequent expiration.

The change in the system produced by continued submersion, the consequent suspension of respiration, and the necessary extinction of life, are all referrible to one pathological condition, namely, a change in the nature of the blood. The water prevents any portion of air from entering by the trachea to the air vesicles of the lungs; consequently no air comes in contact with the venous blood contained in the capillary branches of the pulmonary artery which are spread out upon the walls of these air vesicles; the venous blood which flows to the lungs is therefore incapable of being converted into arterial blood, whence the lungs can deliver to the left side of the heart only venous blood to be sent out to the system. As the circulation goes on, all the arterial blood in the body is at length converted into venous, and flows into the great venous trunks of the system, by which it is returned to the right side of the heart, and thence to the lungs, where it undergoes no change, but remains venous. These currents of venous blood, and of venous blood only, are successively sent out to the system. But venous blood is incapable of maintaining the action and vitality of the brain and spinal cord, of the heart, of the voluntary muscles, or of any organ of the body, and consequently, when nothing but venous blood circulates in the system, the death of all the organs is the sure and quick result.

Sensibility and the power of voluntary motion are diminished the moment the arterial blood begins to lose its vermilion colour; an animal is completely insensible, and has wholly lost all power of voluntary motion, that is, it is in a state of apparent death, as soon as the arterial blood is completely venous. In one minute and a half, then, after complete and continuous submersion, animal life is completely extinguished. But by the prompt and vigorous use of the appropriate remedies, recovery from this state is possible; because the organic functions go on for a considerable period after apparent death, and death is not real until the organic functions have wholly ceased. Nevertheless, though the organic functions may continue for an indefinite period after the animal functions are extinguished, from ten minutes to half an hour, or more, yet, in no instance in which the experiment has been fairly tried has any adult warm-blooded animal that has been completely and continuously submersed for the space of four minutes been capable of resuscitation, though all the means of restoring animation may have been instantaneously and most actively and judiciously employed. Accordingly it is found in practice that the immediate and vigorous use of the best means for restoring animation often fail when the person has not been in the water more than four minutes.

After drowning there is always a quantity of water mixed with frothy matter in the trachea and bronchi. Occasionally this frothy matter is mixed with blood. The quantity varies a good deal in different cases, but it is never very great. At one time it was thought to be so great as to be the cause of death in drowning. It was also supposed that water got into the stomach at the same time, and on this account the barbarous practice of suspending people who had been immersed in water by their heels was had recourse to for the purpose of getting rid of the water. But it is now known that little or no water gets either into the lungs or stomach.

The proper remedies for the recovery of the drowned are few and simple. The body, placed on a bed-chair, should be removed to the receiving house or any place where the conveniences required may be most easily obtained. The wet clothes should be stripped off as rapidly as possible, the body well dried and surrounded by warm air, if it can be readily procured, by the portable warm air bath, of which there ought to be one at every receiving house. At first the heated air should only be a few degrees above the temperature of the body, and the heat, which ought always to be ascertained by a thermometer, should be subsequently increased with caution. The body being thus surrounded with warm air, artificial respiration should be performed without the delay of a moment, and this should be assisted by electricity applied at first in the form of very gentle shocks.

There are some few other useful auxiliaries, but so important and efficacious are these three powerful agents, when judiciously and perseveringly employed, that they may be considered as the only remedies worth regarding. Great caution however should be exercised in their use, for the improper application of any one of them may produce death.

DRUIDS. [BRITANNIA.]

DRUM, a pulsatile musical instrument, of which there are three kinds,—the *Side Drum*; the *Base* or *Turkish Drum*; and the *Double Drum*. The first is a cylinder, made of brass, on each end of which is a hoop covered with vellum or parchment. The second is formed like the first, but of oak, on a much larger scale. The third is made of copper, nearly hemispherical, covered with a strong head of calf's skin, and stands on three iron legs. The Double Drums vary in dimensions, from nineteen inches to three feet in diameter. They are always in pairs, and are tuned, by means of many screws (or of a lever and hooks in the patent drum) which tighten the head to the key-note and the fourth below.

DRUMMOND, WILLIAM, the son of Sir William Drummond of Hawthornden, was born December 13, 1585. He was educated at Edinburgh, and studied civil law in France. On his father's death, in 1610, he relinquished his profession, and devoted himself to literary pursuits. He afterwards travelled on the continent, and collected a library of great value, of which part is now in the possession of the University of Edinburgh. When the civil war broke out, his political bias exposed him to grievous annoyances, particularly that of being compelled to supply his quota of men to serve against the king. He died at Hawthornden, December 4, 1649.

Southey has observed that he was the first Scotch poet who wrote well in English. His sonnets are of a melancholy character, said to have been owing to the loss of his betrothed bride on the eve of his marriage. The resemblance which his versification presents to that of Milton's minor poems is so striking as only to require mention in order to be acknowledged; and few, we should think, could read his poem on the death of Prince Henry without being reminded of 'Lycidas.' He also wrote a history of the five Jameses, kings of Scotland, and some other prose works.

DRUMMOND, CAPTAIN THOMAS, was born at Edinburgh, in October, 1797. His father dying whilst he was an infant, his mother removed to Musselburgh, where she resided many years, devoting herself entirely to the education of her children. Drummond was early entered at the High School of Edinburgh, and there formed an acquaintance with Professors Playfair, Leslie, and Brewster, and also with Professors Wallace and Jardine, whose pupil he more especially was.

In February, 1813, he was appointed to a cadetship at Woolwich, where his mathematical abilities soon made him conspicuous; in fact, while there, he gave a new demonstration of a proposition in conic sections; and this apparently trifling event may perhaps be considered as the foundation of his future fame. While following the course of practical construction in the engineer department, he invented a new species of pontoon which was made sharp at both ends, and divided transversely for the facility of transport. This early part of his career was also devoted to the acquisition of military knowledge; and during the period of his service at Chatham, his military ardour led him to obtain leave of absence for the purpose of visiting the army of occupation in France, and attending one of the great reviews.

In the autumn of 1819 Mr. Drummond became acquainted with Colonel Colby, when that officer was passing through Edinburgh, on his return from the trigonometrical operations in the Highlands; and in the course of the following year an offer from Colonel Colby to take part in the trigonometrical survey was gladly accepted. He had now the advantage of a residence during each winter in London, and, with a definite object in view, again devoted himself, and more closely than ever, to the study of the higher branches of mathematics.

During this period he also devoted considerable attention to the study of chemistry, and attended the lectures of Professors Brande and Faraday. From what he learned on these occasions he was led to the idea of employing as a signal light, a ball of lime in a state of incandescence at the focus of a parabolic mirror.

In 1824, a committee of the House of Commons recommended that a trigonometrical survey of Ireland should be begun, and that Colonel Colby should make arrangements for carrying it on. The recent experience of the Western Islands had shown the probability that, in a climate so misty as Ireland, the difficulty of distant observations would be greatly increased, and Colonel Colby at once saw the important results which might follow such an improvement of the lamp as that which Drummond had devised. Under his judicious advice the experiments were prosecuted, and were rapidly attended with success; their progress and results are detailed by the author in the 'Philosophical Transactions' for 1826, as well as the first application of the lamp to actual use in Ireland. When a station, Slieve Snaught in Donegal, had long in vain been looked for from Davis Mountain, near Belfast, the distance being 66 miles and passing across the haze of Lough Neagh, Mr. Drummond took the lamp and a small party to Slieve Snaught, and by calculation succeeded so well in directing the axis of the reflector to the instrument, that the light was seen forming a steady blaze of surpassing splendour. This was followed by the invention of a heliostat [DRUMMOND'S LIGHT], which was completed in 1825.

A severe illness which Mr. Drummond contracted from exposure during the Irish survey compelled him to return to Edinburgh, where he was unable to devote himself to study, but he had taken much pains to perfect his light, and he now began to revert to the idea that he had early formed of adapting it to lighthouses. In this he was liberally met by the corporation of the Trinity-House, and to it he devoted much of his time during the following winters: the experiments he made, with their success, are detailed in the 'Philosophical Transactions' for 1830.

Mr. Drummond was employed as superintendent of the commission for laying down the boundaries of the old and new boroughs previous to the Reform Act. His labours met with the complete approbation of the ministers of the day.

When the Reform Bill was passed, Mr. Drummond returned to his duties on the survey; but he was again called into public life by being appointed Lord Spencer's private secretary. On the dissolution of the government he received a pension of 300*l.* a year.

In 1835 he was made under-secretary for Ireland. He much distinguished himself in the report on railways in Ireland, being at the head of the Commission. We shall not attempt to trace his labours as a politician or on the railway commission, but his talents and assiduity were admitted by all, even his strongest political opponents. He laboured incessantly at his duties, and probably hastened his death by his continued application. This took place April 15, 1840, 'in the plenitude of mental power and maturity of knowledge, beloved in private and esteemed in public.'

DRUMMOND'S LIGHT. The difficulty of

distinguishing the stations chosen for the angular points of the triangles in a geodetical survey, when those stations are many miles asunder, renders it necesary to have recourse to illuminations even in the day-time; and the late Captain Drummond, of the Royal Engineers, invented a heliostat which reflected the sun's rays in sufficient abundance to render the station which was to be observed visible.

This was a plane mirror of a rectangular form and mounted on a stand with joints by which it could be fixed at any angle with the horizon. On the stand was a telescope which was capable of being moved horizontally, with the mirror, and directed to the distant station, while another telescope was directed to the sun. The adjustments of the mirror were such that, when the telescopes were directed as has been said, the face of the mirror reflected the rays of the sun on the distant station, and illumined it sufficiently to render a mark there visible in the telescope of the theodolite by which the required angle was to be taken.

In order to observe the angles subtended between distant stations at night, Captain Drummond employed a light which has been found to exceed in brilliancy any before used. This is produced by placing a ball or disk of lime, about a quarter of an inch in diameter, in the focus of a parabolic mirror, at the station to be rendered visible, and directing upon it, through a flame arising from alcohol, a stream of oxygen gas. ('Philosophical Transactions,' 1826, p. 324.)

The cistern containing the alcohol is supported on a stand, behind the reflector, and is connected by a tube of caoutchouc with the lower part of a hollow stem supporting the upright wire at the top of which is fixed the ball of lime on a level nearly with the cistern: the spirit ascends in the stem, and afterwards through three or more tubes to the ball. The vessel containing the oxygen gas is connected, by a flexible tube, with an orifice in a cylindrical box on the same stem, from whence it ascends through three flexible caoutchouc tubes to the ball, after passing with friction through three small cylinders. The whole apparatus is attached to a stand which carries the mirror; and adjustments are provided by which the ball may be placed exactly in the focus of the mirror. The intensity of the flame is from sixty to ninety times as great as that of an argand burner, while the expense is only about ten times as great. The lime made from chalk is preferred to any other; and such is the brilliancy, that stations above sixty miles from one another have been very distinctly visible even in hazy weather.

Captain Drummond suggested in a paper which was printed in the 'Philosophical Transactions' for 1830 (p. 383) that burning lime should be employed for lighthouses; and he proposed that, instead of alcohol, hydrogen gas should be employed with the oxygen gas. The gases are to proceed from separate vessels, or gasometers, and enter a chamber through a series of small apertures: the united gases are then to pass through two or three pieces of wire gauze, and issue in two streams against the ball or disk of lime. To prevent the latter from wasting too rapidly in one place, it is made to revolve once in a minute; and in order to keep up a constant light, it is proposed to have an apparatus by which a number of balls may be successively made to fall in the focus of the mirror.

A light of this kind may also be employed as a signal in determining the difference between the longitudes of stations.

DRUPA'CEÆ, the name given by some botanists to that division of rosaceous plants which comprehends the peach, the cherry, the plum, and similar fruit-bearing trees. They are more generally called *Amygdaleæ*.

DRUPE, a closed, one-celled, one or two-seeded seed-vessel, whose shell is composed of three layers; the outer, membranous or leathery; the inner, hard and bony; the intermediate, succulent or fibrous. A peach, a cherry, a mango, are all fruits of this description. A cocoa-nut is a compound drupe, being composed of three consolidated, two of which are abortive; and a date is a spurious drupe, the hard inner shell being represented by a membrane.

DRUSES, DOROU'Z, a people who inhabit the chain of Libanus, in Syria, are under the government of their own chiefs, and have a religion peculiar to themselves. The vernacular language of the Druses is Arabic. Although the mountaineers of Libanus in general obey the emir, or prince of the Druses, yet they are not all Druses, but a great part, perhaps the greater part, of them are Christians of the Maronite communion, and belong to the Western or Roman church. [MARONITES.] The Druses live chiefly in the south part of Libanus, east and south-east of Beirut, and as far south as the district of Hasbeya, about the sources of the Jordan. The capital of the emir of the Druses is Deir el Kamr, in a fine valley on the west slope of Libanus, about eight or nine hours' ride south-east of Beirut. The town is said to have about 5000 inhabitants, partly Druses and partly Christians. It is built in the Italian fashion, and is said to resemble a second-rate country town of Italy. Captain Light saw about twenty silk looms at work round one of the squares.

The religion of the Druses has been a subject of much inquiry, being involved in a kind of mystery. It appears however pretty certain that the Druses are, or were originally, disciples of Hakem biamr Illa, the sixth Fatemite caliph of Egypt, who in the 11th century proclaimed himself to be an incarnation of the Divinity, and who established a secret lodge at Cairo, divided into nine degrees, the last of which taught the superfluousness of all religions, the indifference of human actions, &c. (Von Hammer, 'Geschichte der Assassinen,' 1818.) The Assassins themselves were a derivation of Hakem's sect, which was itself an offshoot of the great schism of the Ismaelites, a remnant of whom still exists in Syria.

DRUSUS, CLAU'DIUS NERO, son of Tiberius Claudius Nero and of Livia, was born in 38 B.C., three months after his mother's marriage with Augustus. He served early in the army, and was sent in 17 B.C., with his brother Tiberius, against the Rhæti and Vindélici, who had

made an irruption into Italy. He defeated the invaders, and reduced their country. Drusus married Antonia Minor, daughter of M. Antonius and Octavia, by whom he had Germanicus and Claudius, afterwards emperor, and Livia or Livilla. In 14 B.C., being sent to quell an insurrection in Gaul occasioned by the extortions of the Roman tax-gatherers, he succeeded by his conciliatory address. In the following year he attacked the Germans, and carrying the war beyond the Rhine, he obtained a series of victories over the Sicambri, Cherusci, Catti, and Tencteri, and advanced as far as the Visurgis, or Weser, for which the senate bestowed the surname of Germanicus upon him and his posterity. In 9 B.C. Drusus was made consul, with L. Quintius Crispinus. He was soon after sent again by Augustus against the Germans, crossed the Visurgis, and advanced as far as the Albis or Elbe. He imposed a moderate tribute on the Frisians, consisting of a certain quantity of hides, which, being afterwards aggravated by the extortion of his successors, caused a revolt under the reign of Tiberius. (Tacitus, 'Ann.,' iv. 72.) He caused a canal to be cut, for the purpose of uniting the Rhine to the Yssel, which was known long after by the name of Fossa Drusi; and he also began to raise dykes to prevent the inundations of the Rhine, which were completed by Paulinus Pompeius under the reign of Nero. Drusus did not cross the Albis, and he retired towards the Rhine, but before he reached that river he died, at the age of thirty, in consequence of a fall from his horse. Tiberius, who was sent for in haste, accompanied his body to Rome, where his funeral was performed with great solemnity. Drusus was much regretted both by the army and by the Romans in general, who had formed great expectations from his manly and generous sentiments. One of his grandsons, Drusus, son of Germanicus and of Agrippina, was starved to death by order of Tiberius, and Nero, the other, was put to death in the island of Ponza.

DRUSUS, the son of Tiberius by Vipsania, daughter of Agrippa, served with distinction in Pannonia and the Illyricum, and was consul with his father A.D. 21. In a quarrel he had with the favourite Sejanus, he gave him a blow in the face. Sejanus, in revenge, seduced his wife Livia or Livilla, daughter of Drusus the elder and of Antonia, and the guilty pair got rid of Drusus by poison. The crime remained a secret for eight years, when it was discovered after the death of Sejanus, and Livia was put to death. (Tacitus, *Annal.*)

DRY ROT, a well-known disease affecting timber, and particularly the oak employed for naval purposes. When dry rot is produced by the attacks of fungi, the first sign of it consists in the appearance of small white points, from which a filamentous substance radiates parallel with the surface of the timber. This is the first stage of growth of the seeds of the fungus, and the filamentous matter is their thallus, or spawn. As the thallus gathers strength it insinuates its filaments into any crevice of the wood, and they, being of excessive fineness, readily pass down and between the tubes from which the wood is organized, forcing them asunder, and completely destroying the cohesion of the tissue. When the thalli of many fungi interlace, the radiating appearance can no longer be remarked; but a thick tough leathery white stratum is formed wherever there is room for its development, and from this a fresh supply of the destructive filamentous thallus is emitted with such constantly increasing rapidity and force, that the total ruin of timber speedily ensues where circumstances are favourable for the growth of the fungi.

It is generally stated that dry rot consists of the thallus of *Merulius lacrymans*, or *Polyporus destructor*, two highly organized fungi, whose fructification is sometimes found upon rotten timber. But it is a great mistake to suppose that dry rot belongs exclusively to those two species, or that they are even the common origin of it. On the contrary, there is reason to believe that any of the fungi that are commonly found upon decaying trees in woods are capable of producing dry rot, and it is quite certain that one of the most rapidly spreading and dangerous kinds is caused by the ravages of different species of *Sporotrichum*. The latter throw up from their thallus whole forests of microscopic branches loaded with reproductive spores, of such excessive smallness that they may insinuate themselves into the most minute crevices or flaws even in the sides of the tubes of which timber consists, and they are infinitely more dangerous than *Merulii* or *Polypori*, which seldom fructify. The genus Sporotrichum is known to produce the dry rot in ships.

The circumstances that are most favourable to the development of the dry rot fungi are damp unventilated situations, and a subacid state of the wood. The most effectual agent in the destruction of the sporules of fungi is corrosive sublimate. This fact confirms the statement of Mr. Kyan, as to the impossibility of timber steeped in a solution of corrosive sublimate becoming a prey to dry rot, so far as dry rot is produced by a fungus.

DRYANDRA, a genus of Australian shrubs. The species are much esteemed by cultivators for their beautiful evergreen leaves. They are commonly regarded as greenhouse plants, but will, in several cases, survive an English winter without injury, if protected by a glass roof in winter, and planted among rockwork high above the dampness of the level of the soil.

DRYAS, a genus of plants belonging to the natural order *Rosaceæ*, and to the tribe *Dryadeæ*. *D. octopetala* has white flowers, with a woody prostrate stem and simple leaves with a woolly pubescence beneath. It is a native of Alpine districts of Europe, and is found on the mountains of Scotland and Ireland, and in Yorkshire in England. *D. depressa* has only been found at Ben Bulben in Sligo, and has been recently described by Babington in the 'Annals of Natural History.' There are three other species described, one a native of Greenland, and two natives of North America. They are all evergreen prostrate plants.

DRYDEN, JOHN, was born in 1631, at Aldwinkle in Northamptonshire. His father, *Erasmus Dryden*, was the third son of Sir Erasmus

Driden, of Canons Ashby, in that county, who was created a baronet in 1619. The poet was educated at Westminster school under Dr. Busby, and came up as a Westminster scholar to Trinity College, Cambridge, May 11, 1650, where he took the degree of B.A. in 1654.

In 1654 his father's death put him in possession of an estate worth about 60*l.* per annum. He did not however leave Cambridge till 1657. The stanzas on Cromwell's death, his first poem of any importance, were written in 1658, and in 1660 he signalised himself by 'Astræa Redux,' a congratulatory address on the Restoration. In 1663 Dryden began his dramatic career with 'The Wild Gallant.' The plague and fire of London interrupted him for a time, and he employed himself upon his 'Essay on Dramatic Poesy,' a performance containing much elegant writing, and worthy of notice as the earliest regular work of the kind in our language, and for the manly avowal—the first since the Restoration—of the supremacy of Shakspeare. In 1665 he married a daughter of the first Earl of Berkshire.

On the revival of stage plays, he engaged to supply the King's Theatre with three plays a year, for the annual sum of 300*l.* to 400*l.* The number produced did not amount to more than eighteen in sixteen years. Towards the end of 1671 the burlesque on heroic dramas called the 'Rehearsal' was produced, of which Dryden was the original of the character of Bayes; and one effect of it was that Dryden exchanged tragedy for comedy. A few years afterwards he took leave of rhyme. His last rhyming tragedy, 'Aureng-Zebe,' was brought out in 1675; but he continued to write for the stage until 1681.

At length, after having written no verse except for the theatres during about fourteen years, Dryden resumed the species of poetical composition in which he had first distinguished himself. All his poems after this date belong to what may be called his third and latest manner, from which all heaviness and languor have disappeared, and given place to an animation and fervour, a force, freedom, and fearlessness of execution, in which he is not surpassed by any other English poet.

In 1680 a translation of Ovid's Epistles into English came out: two of which, together with the Preface, were by Dryden. In the following year he published 'Absalom and Achitophel,' a work of first-rate excellence as a political and controversial poem. Dr. Johnson ascribes to it 'acrimony of censure, elegance of praise, artful delineation of character, variety and vigour of sentiments, happy turns of language, and pleasing harmony of numbers; and all these raised to such a height as can scarcely be found in any other English composition.' In the same year 'The Medal,' a satire, was given to the public. This piece was occasioned by the striking of a medal on account of the indictment against Lord Shaftesbury being thrown out, and is a severe invective against that celebrated statesman.

In 1682 Dryden published 'Religio Laici,' in defence of revealed religion against Deists, Papists, and Presbyterians. Yet soon after the accession of James II. he became a Roman Catholic; and in the hope of promoting Popery, he was employed on a translation of Maimbourg's History of the League, an account of the parallel between the troubles of France and those of Great Britain. This extraordinary conversion exposed him to much ridicule from the wits.

In the same year appeared the first edition of his tremendous crucifixion of Shadwell—his 'Mac-Flecnoe, or a Satire on the True Blue Protestant Poet, T. S., by the Author of Absalom and Achitophel.' Richard Flecnoe was an Irish priest, well known about the court, whose name had become proverbial for his wretched verses; and Shadwell is represented as his adopted son, who is to succeed him as monarch of the realm of Dulness and Nonsense.

'Mac-Flecnoe' was followed by a second part of 'Absalom and Achitophel,' of which the greater part was written by Nahum Tate, and was only revised by Dryden; but Dryden inserted about two hundred lines of his own, in which, exhibiting Shadwell and Settle under the names of Og and Doeg, he has laid his scourge on both without mercy. With Settle he had had an old quarrel, in which the Earl of Rochester having been implicated, he had, in 1679, caused Dryden to be attacked and beaten by bravoes.

The 'Hind and Panther,' a controversial poem in defence of the Romish church, appeared in 1687. The Hind represents the Church of Rome, the Panther the Church of England. The absurdity of a fable exhibiting two beasts discoursing on theology was ridiculed in the 'City Mouse and Country Mouse,' a prose dialogue after the manner of the 'Rehearsal,' the joint production of Montague, afterwards Earl of Halifax, and Prior, who then put forth the first sample of his talents.

In 1688 Dryden published 'Britannia Rediviva,' a congratulatory poem, in a high style of adulation, on the birth of the Prince afterwards known by the title of the Pretender. But even if he had not so identified himself with the ejected dynasty, his conversion to Popery disqualified him for holding his place of laureate after the Revolution. He was accordingly dispossessed of it; and the mortification of its being conferred on an object of his confirmed dislike aggravated the pecuniary loss, which he could ill afford. His successor was his old enemy Shadwell. In 1693 a translation of Juvenal and Persius appeared. The first, third, sixth, tenth, and sixteenth satires of Juvenal, and the whole of Persius, are Dryden's. In 1694 Dryden published a prose translation of Du Fresnoy's 'Art of Painting,' with a Preface, exhibiting a parallel between painting and poetry. Pope addressed a copy of verses to Jervas, the painter, in praise of this work.

The most laborious of Dryden's works, the translation of Virgil, was given to the world in 1697. The 'Pastorals' were dedicated to Lord Clifford, the 'Georgics' to Lord Chesterfield, and the 'Æneid' to Lord Mulgrave: an economical and lucrative combination of flattery, which the wits suffered not to pass unnoticed. The translation had an extensive sale, and has since passed through many editions.

Besides the original pieces and translations

already mentioned, Dryden wrote many others. They consist of translations from the Greek and Latin poets; epistles, prologues, and epilogues; odes, elegies, epitaphs, and songs. 'Alexander's Feast, an Ode for Saint Cecilia's Day,' displays one of the highest flights within the compass of lyric poetry. His 'Fables' in English verse, from Homer, Ovid, Boccaccio, and Chaucer, were his last work: they were published in 1698. The preface gives a critical account of the authors from whom the Fables are translated. In this work he furnished us with the first example of the revival of ancient English writers by modernising their language. Yet those readers who can master Chaucer's phraseology, and have an ear so practised as to catch the tune of his verse, will like him better in the simplicity of his native garb than in the elaborate splendour of his borrowed costume.

Dryden was a voluminous writer in prose as well as in verse, and quite as great a master of the English language in the former as in the latter. His performances in prose consist of Dedications, Prefaces, and controversial pieces; the Lives of Plutarch and Lucian, prefixed to the translations of those authors by 'Several Hands;' the Life of Polybius, prefixed to the translation of that historian by Sir Henry Shears; and the Preface to Walsh's Dialogue concerning Women. The best edition of Dryden's Works is in 18 vols. 8vo., with Life and Notes by Sir Walter Scott.

Dryden died at his house in Gerard Street, Soho, London, May 1, 1700. He was buried in Westminster Abbey, where a monument was erected to his memory, by John, Duke of Buckingham.

DRYOBA'LANOPS, a genus established by the younger Gærtner, from specimens of the fruit found in the Banksian collection, supposed by him to belong to the tree which yielded the best cinnamon. But Mr. Colebrook, from specimens sent to Dr. Roxburgh, which in the absence of the latter he received, ascertained that the fruit belonged to the Camphor-Tree of Sumatra, which he accordingly named *Dryobalanops camphora*. According to Blume, the existence of this camphor-yielding tree was first indicated by Grimm in 'Ephem. Nat. Cur.' Kæmpfer was so well acquainted with its distinctness, that in describing the Camphor-Tree of Japan (*Laurus camphora*), he says, 'that natural camphor, of crystal-like appearance, which is scarce and of great value, is furnished by a tree of Borneo and Sumatra, which is not of the Laurel genus.' The fullest account of this tree is given by Mr. Prince, resident of Tappanooly, who describes the tree as growing spontaneously in the forests, and as being found in abundance from the back of Ayer Bongey as far north as Bacongan, a distance of 250 miles. He says that it may be classed among the tallest and largest trees that grow on this coast, several within daily view measuring 6 or 7 feet in diameter. The produce of camphor of a middling-sized tree is about eleven pounds, and of a large one double that quantity. ('Fl. Ind.' ii. p. 616.) This kind of camphor is very highly esteemed by the Chinese. It is commonly called Malay Camphor, or Camphor of Barus, from the port of Sumatra whence it is mostly shipped. Its price in China is 100 times greater than that of the common camphor of commerce. (M'Culloch's 'Commercial Dict.') In consequence of the high price this camphor obtains in the Chinese market, it is seldom seen in any other country.

DRYOPS, the name given by Olivier to a genus of pentamerous coleopterous insects of the family *Clavicornes*. The type is the *Dermestes auriculatus* of Geoffroy, a little oblong gray sluggish beetle, not uncommon in Europe in the neighbourhood of watery places. Fabricius changed the name of this genus into *Parnus*. It includes fourteen species, of which seven are American and seven European. The name of *Dryops* was applied by Fabricius to another genus of *Coleoptera*, of which the *Œdemera femoralis*, a Swiss insect, was the type. Changes of this kind are highly censurable, increasing as they do the confusion arising from a complicated synonymy.

DUAL NUMBER. The Greek, Sanscrit, and Gothic, of ancient languages, and the Lithuanian of modern, in addition to the undefined plural which they share with other tongues, possess also forms of the verb and noun in which *two* persons or things are denoted, called the dual number. On a careful consideration of the suffixes which are supposed to convey this notion, there seems reason for believing that the idea of duality was not originally contained in them, but simply that of unlimited plurality.

DUAREN, or DUARE'NUS, FRANÇOIS, a French lawyer, was born about the year 1509. His youth was chiefly devoted to literature; and he is said to have acquired the rudiments of his professional education from conversation with M. Budé, Maître des Requêtes, at Paris, to whose children he was employed as tutor. He afterwards taught law at Bourges, where, in his old age, as defender of the established system of jurisprudential instruction, he carried on a long controversy with Cujacius, who was then a young man. Cujacius acknowledged that to the exertions he made in this controversy he owed much of his subsequent legal knowledge and critical discrimination.

Duaren died at Bourges in 1559. His works were published at Leyden, in 1584, in two vols., folio; and there are subsequent editions. Some of his minor works are published in the 'Tractatus Tractatuum.' There is a Memoir of him in Taisand's 'Les Vies des plus Célèbres Jurisconsultes.'

DUBLIN, a county of Ireland, in the province of Leinster, is bounded N. by Meath, E. by the Irish Channel, S. by Wicklow, and W. by Kildare and Meath. The greatest length, N. and S., is 32 miles; the greatest breadth, E. and W., is 18 miles. The area is 354 square miles, or 226,414 acres, of which 196,063 are arable, 19,312 uncultivated, 5519 in plantations, and 1820 in towns. The population in 1841 was 140,047, of whom 113,778 were in the rural district, and 26,269 in the civic district, exclusive of the city of Dublin.

The county of Dublin, excepting a small tract on the south, is a champaign country highly cultivated. The Dublin Mountains, of which the

central group has an average height of 1000 or 1200 feet, are partially separated from the loftier elevations of the county of Wicklow by the valleys of Glencullen and Ballynascorney. The other chief eminences of the county are the Man-of-war Hills, Lambay Isle, Ireland's Eye, and the Hill of Howth (567 feet).

The principal creeks and harbours of the county are the following:—North of Dublin are the small and unimportant creeks of Baldoyle, Malahide, and Rogerstown; the harbour of Balgriggan, the fishing village of Skerries; and Howth Harbour. A rocky promontory, on which is a lighthouse, separates Howth Harbour from Dublin Bay. As a harbour, the Bay of Dublin is materially incumbered by a great tract of sand, which is bisected by the Liffey, in a direction from west to east, into two portions called the North and South Bulls. In order to protect the harbour from obstruction by this sand-bank, piers and sea-walls have been constructed at a great expense, and a constant outlay is required for repairing and dredging. The bay extends across, from Howth to Dalkey, about 6¼ miles, and extends semicircularly inland about 6 miles. On account of the imperfections of this bay as a harbour, a noble harbour has been formed at Kingstown, on the site of the old harbour of Dunleary, a little southward of Dublin Bay.

The Liffey has a course of little more than 8 miles from the point where it enters Dublin County to the Bay of Dublin at Ringsend. It is navigable for vessels of 200 tons to the Custom-house, and for barges and row-boats to Chapel Izod, about 2 miles farther up. The Dodder and the Tolka are the other chief rivers of the county. The Royal Canal, 94 miles long, and capacious enough for boats of 100 tons burthen, extends from Dublin to the Upper Shannon in the county of Longford. The Grand Canal, about 92 miles long, and rather more capacious than the Royal, extends from Dublin to the Shannon at Shannon Harbour. At the Dublin end there is an extensive range of docks. The railways of this county, completed or in progress, are—the Dublin and Kingstown, of which the Dalkey Extension is worked by atmospheric pressure; the Dublin and Drogheda; the Great Southern and Western (to Cork and Limerick); the Midland Great Western (to Athlone and Galway); and the Dublin and Rathfarnham. The Royal Canal has been bought up by the Midland Great Western Company.

The climate of Dublin is temperate; frosts rarely continue more than a few days, and snow seldom lies. The prevailing winds are from the west. It appears by a mean of observations that the dry days in Dublin are to the rainy as 110 to 255.

The greater part of the county of Dublin is occupied by a tract of mountain limestone, being a part of the central limestone field of Ireland. Along the northern coast there are patches of primitive rock, as greenstone, argillaceous schists, and stratified quartz. The primitive formation on the south of the limestone plain consists of a ridge of granite supporting flanks of micaceous and argillaceous schists. The limestone, which elsewhere possesses the usual character of carboniferous limestone, is extremely compact along the margin of the field towards the primitive series, and has a schistose structure, which renders it highly useful as a material for building. A little lead, manganese, fullers' earth, and potters' clay, are met with in the county. There are mineral springs in great abundance.

The vegetable soil of the county of Dublin is generally shallow. On the granite bottom it is a light gravel, which requires strong manuring. There is but a small proportion of the county under tillage. Villas, gardens, dairy farms, kitchen gardens, and nurseries, occupy the immediate neighbourhood of the capital, and grazing farms and meadow lands extend over the country which is not occupied by demesnes, to a distance of 10 and 12 miles beyond those on the west and north. The land under crops in 1847 comprised corn and beans, 47,049 acres; potatoes, 3279 acres; turnips, 5403 acres; meadow and clover, 38,160 acres; other crops, 4028 acres: total, 97,919 acres under crops.

The commerce of the county of Dublin, exclusive of the capital and its immediate vicinity, is limited to the small coast-trade carried on at Balbriggan, Bray, and the other coast towns. Considerable quantities of flour are manufactured in this county. The principal corn-mills are on the Liffey, the Balbriggan River, and the Kimmage Brook, on the south-west of Harold's Cross. The fisheries off the coast used to be considerable; but since the discontinuance of the bounty they have declined.

Divisions, Towns, &c.—The county of Dublin is divided into 9 baronies. It is in the archdiocese of Dublin and diocese of Glandelagh. The assizes are held at Kilmainham. The county returns two members to parliament, and two are returned for the city of Dublin.

The following are the principal towns, with the population of each in 1841:—

Balbriggan is a small town and seaport, 20 miles N. from Dublin. Cotton stockings are manufactured in the town, and the embroidering of muslin is carried on to a considerable extent in the town and neighbourhood. A handsome church and a large Roman Catholic chapel are both of modern erection. The port has a little coasting trade, and in summer is frequented as a bathing-place. Population of the town, 2959.

Blackrock is a maritime town, 5 miles S.E. from Dublin, on the south shore of Dublin Bay and on the great thoroughfare by road and railway to Kingstown and Bray. It is resorted to as a bathing-place. Population, 2372.

Harold's Cross, a village 3 miles S. by W. from Dublin, is pleasantly situated near the Grand Canal, on the road to Rathfarnham. The village occupies a wide area, and has a large central green. The church is spacious and elegant. Population, 2789.

Howth, a maritime town occupied chiefly by fishermen, stands on the north side of the Hill of Howth, which forms so conspicuous an object on the north shore of Dublin Bay. The hill is on a peninsula joined to the mainland by a low sandy

isthmus. The Baily Lighthouse, on the south angle of the hill, can be seen 17 miles in clear weather. The church and the Roman Catholic chapel are both neat edifices. Howth Castle is an embattled structure, with a tower at each end. Previous to the construction of Kingstown harbour Howth was the chief packet-station. Population, 1538.

Kilmainham, where the assizes for the county are held, and where the county court-house and county gaol are situated, is a village 2 miles W. from Dublin. Population, 670.

Kingstown, a seaport and town, and a royal mail packet station, is situated on the south shore of Dublin Bay, 7 miles E.S.E. from the General Post-office, Dublin. It was originally a mere fishing village called Dunleary, but was constituted a harbour of refuge by an Act passed in 1815; and when George IV. embarked there in 1821 the name was changed to the Royal Harbour of George IV., which was afterwards altered to Kingstown. The town consists of good houses and regular streets, with handsome public buildings, hotels, and baths. There is a railway from Dublin to Kingstown, 6 miles, which was opened in 1834, and an atmospheric railway extends from Kingstown to Dalkey, 1¼ miles. The harbour was commenced in 1816 from designs by the late Mr. Rennie. The eastern pier is 3500 feet long, and the western 4950 feet, leaving at the mouth an opening of 850 feet, and inclosing an area of 250 acres, the depth varying from 15 to 27 feet. Four royal mail steam-packets ply between Holyhead and Kingstown, and four between Birkenhead and Kingstown, and three large steam-packets ply between Dublin and Kingstown. The chief imports of the port are coal, iron, and timber; the exports, cattle, grain, lead-ore, and granite. Upwards of 2000 vessels enter and leave the port annually, of an average burthen of more than 200,000 tons. Population of the town, 7229.

Ranelagh is a village, suburban to Dublin, 2 miles S.E. from the General Post-Office. Population, 2290.

Rathmines is a village, suburban to Dublin, 2 miles S. from the General Post-Office. Little more than twenty years ago it was an insignificant village, but is now a continuous line of elegant buildings a mile and a half in length. The chapel of ease is a gothic structure, and there is a large Roman Catholic chapel. Population, 2429.

Rush is a small fishing town, 17 miles N. by E. from Dublin. It consists of a long street of houses, partly thatched and partly slated, situated along a slightly elevated sandy ridge which extends from the chapel to the pier. Population, 1603.

Skerries, a large fishing town, is situated on a little headland about 4 miles S.E. from Balbriggan, and 18 miles N. by E. from Dublin. The harbour is good, though it only admits small vessels. The main street, about a mile in length, is wide and irregularly built. The town contains a church, a Roman Catholic chapel, and a Methodist meeting-house. Population, 2417.

Swords, 8 miles N. from Dublin, is watered by a small river which falls into the bottom of Malahide Bay. It is an ancient town, and the houses are small. There is a rude round tower, and a modern gothic church. Population, 1788.

History and Antiquities.—The civil history of the county of Dublin is immediately connected with that of the capital. The pagan antiquities are not numerous; they consist mainly of three cromlechs. Dublin is however rich in ecclesiastical and military antiquities. The round tower of Clondalkin, 4½ miles from Dublin, is in better preservation than most other similar edifices in Ireland. The antiquities at Swords, 8 miles from Dublin, consist of a palace of the archbishops of Dublin, in ruins, a square steeple of the old church, and a round tower, 73 feet in height. At Lusk there is an ancient church with a square steeple, attached to three of the angles of which are round towers with graduated parapets, and at the remaining angle a round tower of greater altitude and superior construction, supposed to be the original building. Between Swords and Baldoyle, 5 miles from the capital, is the hamlet of St. Doulagh's, containing one of the most singular stone-roofed churches in Ireland. In the vicinity of Howth Castle are the ruins of St. Fintan's Church, and of the collegiate church and abbey of Howth. There are some interesting remains of antiquity at Dalkey, Clontarf, Baldongan, Naul, and Castleknock.

DUBLIN, a county of a city, municipal borough, parliamentary borough, and the metropolis of Ireland, is situated on both sides of the river Liffey, at its entrance into the Bay of Dublin, in 53° 20′ 38″ N. lat., 6° 17′ 30″ W. long., 292 miles W.N.W. from London, 138 miles W. by S. from Liverpool, and 63 miles W. from Holyhead. Besides the Liffey, it is watered by the Dodder, the Tolka, and the Slade.

Dublin lays claim to high antiquity, and was several times in the possession of the Danes in the 9th, 10th, and 11th centuries. It was visited by Henry II. in 1172, and by king John in 1210, who built the castle, and established courts of justice. Queen Elizabeth had the castle fitted up as a residence for the lord-lieutenant in the beginning of her reign, and in 1591 she founded Trinity College. Previous to the reign of Elizabeth, the houses of Dublin, except the public buildings, were formed of clay and wattles; stone and brick were hardly in use before the reign of James I. It is now the second city of the empire, is three miles long from N. to S., and nearly as much broad from E. to W. It contains more than 800 streets, 22,000 houses, and 233,159 inhabitants.

Dublin is nearly surrounded by the Circular Road, 9 miles in extent. The Liffey is crossed by 9 bridges, 7 of which are of stone and 2 of iron, and is embanked on each side along the whole range of the city by quays faced with granite. The length of the bridges varies from 140 feet to 258 feet. There are 5 squares, of which Stephen's Green is the largest.

The ground on which Dublin stands rises gently from the river towards the north and south-west. The eastern division on the south of the

river lies almost wholly without the limits of the ancient city, on level ground, the northern part of which has in a great measure been reclaimed from the former bed of the Liffey. The whole area of College Green, on the east, is occupied by the front of Trinity College, a rich and dignified pile of building of the Corinthian order, built in 1759, and extending north and south 300 feet. Adjoining to it is Trinity College Park, the area of which is about 20 acres.

The division of Dublin which lies west from the Castle, on the south side of the Liffey, is the oldest part of the city, and is now almost exclusively occupied by persons in trade, small dealers, and the labouring classes. The Castle of Dublin, at the north-eastern extremity of this district, consists of two handsome quadrangles, surrounded, except on one side, by the apartments of state and the offices of government. West of the Castle stands Christ's Church Cathedral, a venerable cruciform structure, part of which is of a date anterior to the coming of the English. South from Christ Church is the Cathedral of St. Patrick, situated at the foot of the declivity, the ridge of which is occupied by the castle and older cathedral. St. Patrick's is an imposing pile, consisting of nave, transepts, and choir, with a chapter-house at the east end. On the south of this division are—a penitentiary, the Portobello barracks, and several hospitals; and on the west, towards Island Bridge, the Royal Hospital of Kilmainham; the Foundling Hospital; Swift's Hospital for Lunatics; Stevens's Hospital; Kilmainham Gaol and the County Court House, and the artillery barracks at Island Bridge.

The eastern division of the city, lying north of the Liffey, occupies higher ground, and is the airiest and most cheerful part of Dublin. The Custom-House occupies a detached plot of ground on the quay leading from Carlisle Bridge to the north wall. This splendid building, founded in 1781, is 375 feet in length by 205 feet in depth, and exhibits four decorated fronts of the Doric order; the columns, &c., being of Portland stone, and the body of the building of cut granite. To the east of the Custom-House are docks and stores, which are on a very extensive scale, surrounded by a lofty wall. Near the middle of Sackville Street, stands a fluted Doric column, on a pedestal of large proportions, surmounted by a colossal statue of Lord Nelson. This monument was erected in 1808. West of Nelson's monument the General Post-Office presents a cut granite front of 223 feet to the street, with a central portico of Portland stone.

The western division of the city, north of the river, is not intersected by any street of large proportions, and is almost exclusively occupied by dealers, tradesmen, and labourers. The portion of it which lies along the quays and towards the Blue Coat Hospital is however well built and respectably inhabited. The Four Courts, situated on King's Inn Quay, in this district, was commenced in 1786, and is a building of great extent and splendour. Westward from the courts of law, the Royal Barracks occupy an elevated site. In the outskirts of this division of the city, N.E. from the Royal Barracks, are—the Blue Coat Hospital, founded in 1773; the Richmond Bridewell and Penitentiary, and the House of Industry and hospitals attached; the Linen Hall, and the King's Inns. In the eastern part of the district are Newgate, the Sheriff's Prison, and the Sessions House for the county of the city. West of the Royal Barracks is the Phœnix Park, a finely-wooded demesne of 1759 acres, containing the vice-regal lodge, and lodges of the secretaries; the Zoological Society's Gardens and establishment; the Royal Military Infirmary; the Hibernian Society's School for the education of the children of soldiers; a powder-magazine and artillery station; and a grand obelisk, erected in commemoration of the victories of the Duke of Wellington.

Besides the two cathedrals, the city contains 20 parish churches, 20 churches non-parochial, 9 Roman Catholic parochial chapels, 6 Friaries, 1 Jesuits' Church, 3 monasteries, and 8 convents. Of places of worship for dissenters, there are—4 Presbyterian, 2 Unitarian, 3 Independent, 1 Seceding, 7 Wesleyan, 2 Quaker, 1 Baptist, 1 Moravian, 1 German Lutheran, 1 Welsh Methodist, and 1 Synagogue. Of educational institutions, there are, besides Trinity College, the Royal Dublin Society, the Royal Irish Academy, the Royal Hibernian Academy of Painting, Sculpture, and Architecture, the National Education Society, Kildare Place Society, the Dublin Society, and others of less importance.

The principal places of recreation are—the Theatre Royal, the Queen's Theatre, the Abbey-Street Theatre, the Rotunda Garden, and the Portobello Gardens.

The hospitals, dispensaries, and similar charitable institutions, in Dublin, are very numerous.

The number of children of 15 years and under receiving instruction in the public schools, in 1841, was 7445 males and 5353 females, in rudimentary schools; 1359 males and 973 females, in superior schools; total, 15,130, the whole population of 15 years and under being 43,125.

The paving, lighting, and cleansing of the city are vested in a board of three commissioners. The supply of fuel is almost wholly by colliers from the opposite coast of England, especially Whitehaven. Turf is retailed for lighting fires, &c., in which mode considerable quantities are used: the supply is furnished from the extensive bogs of Kildare and Westmeath by the boats of the Grand Canal and Royal Canal. Much of the inland trade is carried on by these canals. Brewing, iron-casting, and cabinet-making are the principal manufactures in a prosperous state.

Dublin harbour, since the completion of the Northern Pier, or Clontarf Breakwater, has been greatly improved, the depth having been increased at low water spring-tides from less than 8 feet to about 12 feet. The trade is chiefly cross-channel with Liverpool and London by steamers. The number of sailing vessels registered Jan. 1, 1848, was 407 (31,553 tons); steamers, 46 (10,865 tons). The number of sailing vessels, coastwise, from Jan. 1, 1847 to Jan. 1, 1848, was, inwards, 4388 (362,174 tons); outwards, 1,793 (140,451 tons); steamers, inwards, 947 (253,139 tons);

outwards, 961 (255,379 tons). In the colonial and foreign trade the number was, inwards, 493 (95,446 tons); outwards, 342 (77,845 tons).

The municipal borough is divided into 15 wards, and is governed by 15 aldermen (of whom one is Lord Mayor), and 45 councillors.

The parliamentary borough returns two members to the House of Commons: constituency, 14,667. Two members are also returned for the university of Trinity College: constituency, 1700.

The university of Dublin is incorporated as 'the College of the Holy and Undivided Trinity near Dublin, founded by the most serene Queen Elizabeth.' The collegiate body consists of a provost, seven senior fellows, one of whom is vice-provost, eighteen junior fellows, seventy scholars, and thirty sizars. The number of students is generally about 2000.

(Walsh's *History of the City of Dublin*, London, 1818; Fraser's *Handbook for Ireland*, 1844; Thom's *Irish Almanac*, 1846.)

DUBOS, JEAN BAPTISTE, was born at Beauvais in 1670. He was employed by M. De Torcy, minister of foreign affairs, on several secret negotiations, and was rewarded by a pension. Having retired from political life, he devoted himself to literature. He died at Paris in 1742. His 'Réflexions Critiques sur la Poésie et sur la Peinture,' is the work by which he is chiefly known. His other productions were the 'Histoire de la Ligue de Cambrai,' and 'De l'Etablissement de la Monarchie Française dans les Gaules.'

DUCAREL, ANDREW COLTEE, an eminent English antiquary, was born in 1713, in Normandy. His father, some time after his birth, removed to England. Young Ducarel was educated at Eton, and in 1731 was admitted a gentleman-commoner of St. John's College, Oxford; B.C.L. 1738; LL.D. 1742, and became a member of Doctors' Commons in 1743. He was elected commissary of the exempt jurisdiction of the collegiate church of St. Katharine, near the Tower of London, in 1755, and was appointed commissary and official of the city and diocese of Canterbury by Archbishop Herring in 1758. Upon the incorporation of the Society of Antiquaries in 1755, he was appointed one of its first fellows. He died May 29, 1785.

Dr. Ducarel's life was one of indefatigable industry, and his publications, most of them on antiquarian subjects, were extremely numerous. An account of them is given in Nichols's 'Literary Anecdotes,' vol. vi. Dr. Ducarel also took a part in the dispute concerning Corsellis as the first printer in England, and he entered deeply into the Rowleian controversy, of which he entertained what is now the general opinion.

DUCAT. [Money.]

DUCCIO DI BUONINSEGNA, a painter of Siena, was born in the 13th century. Duccio was to the school of Siena what Cimabue was to that of Florence. His active career was probably between 1285 and 1315. He is mentioned in the Siena archives of 1285, when he may have been about 25 years of age; and he is mentioned also as late as 1311, when he completed his great work, the celebrated altar-piece of the cathedral, which he commenced in October, 1308. It was removed from the altar in the early part of the 16th century to give place to a tabernacle, and was afterwards cut in two, and the halves were placed in the choir, where they still remain.

There are other works by Duccio extant. The year of his death is not known; Della Valle supposes he died about 1340. Rumohr places his death upwards of twenty years earlier.

DUCHANGE, GASPARD, a French etcher and engraver, was born at Paris in 1662, and died there at the advanced age of ninety-four. He was the pupil of Jean Audran, and was one of the best historical and portrait engravers of his period. Three of his most celebrated works were the 'Io,' 'Danaë,' and 'Leda' of Correggio, of which he afterwards destroyed the plates. He engraved until his ninety-first year, and his works are numerous.

DUCHIES of CORNWALL and LANCASTER. [Civil List.]

DUCIS, JEAN FRANÇOIS, was born at Versailles in 1732, and became a dramatic writer somewhat late in life. His first pieces made but little impression, and it was only by his versions of Shakspere that he acquired celebrity. At different periods he produced 'Hamlet,' 'Romeo and Juliet,' 'Macbeth,' 'Othello,' and 'Lear;' but he has so altered the works of our great author, that were it not for the name we should with difficulty discover any connexion between the original and the version. He afterwards became secretary to Louis XVIII., to whom he was devotedly attached. Ducis died in 1816.

DUCKS, *Anatinæ*, a sub-family of *Anatidæ*, including the true Ducks of Swainson only. The order *Natatores* (the *Palmipedes* of our older naturalists, and *Anseres* of Linnæus) is divided by most ornithologists into five families, viz.: *Anatidæ*, *Colymbidæ*, *Alcadæ*, *Pelecanidæ*, and *Laridæ*.

Of these families the first, *Anatidæ*, embraces the Geese, the Swans, the true Ducks, the Ducks with a lobated hind toe, and the Mergansers; each of these groups respectively constituting a sub-family. Thus we have *Anserinæ*, *Cygninæ*, *Anatinæ*, *Fuligulinæ*, and *Merganinæ*.

'The first division of true Ducks' (or *Anatinæ*), says Mr. Yarrell, 'will contain the Shiel Duck, Muscovy (Musk) Duck, Wild Duck, Gadwall, Shoveller, Pintail, Widgeon, Bimaculated Duck, Gargany, and Teal, all of which will be found to have the following characters in common:—Externally they exhibit considerable length of neck; the wings are also long, reaching to the end of the tail; the tarsi somewhat round; the hind toe free, and having no pendent lobe. In habits they may be stated generally as frequenting fresh water, but passing much of their time on land, feeding in ditches, and about the shallow edges of pools, on aquatic plants, insects, worms, and occasionally fish, taking their food at or near the surface; possessing great powers of flight, but seldom diving unless pursued. Of their internal soft parts, the stomach is in the greatest degree muscular, forming a true gizzard; the intestines long; the cæcal appendages from six to

nine inches in length in the larger birds, and decreasing only in proportion to the size of the species. Of the bones it may be observed that the ribs are short, extending but little beyond the line of the posterior edge of the sternum; the keel of the breast bone deep, affording great extent of surface for the insertion of large and powerful pectoral muscles. The osseous enlargement (or drum) at the bottom of the trachea (within the body) is in all of them composed of one bone only. The wild duck may be considered the type of this division.' ('Linn. Trans.' vol. xv. p. 378.) The sub-family thus characterised by Mr. Yarrell is divided by Mr. Swainson into one typical, one sub-typical, and three aberrant groups. On this point we refrain from observation, recommending those who wish to study the peculiar views of that zoologist, as far as the present group is concerned, to consult his paper 'On those Birds which exhibit the typical Perfection of the Family Anatidæ,' in the 'Journal of the Royal Institution of Great Britain,' August, 1831.

A few observations on the beak and tongue of the *Anatinæ*, applicable not only to the *Anatidæ* generally, but also to the *Natatores*, with certain modifications, cannot be, with propriety, here omitted, although their repetition may be elsewhere necessary.

The beak of the Duck, armed with a nail, or dertrum, at its tip, is at once a feeler, a strainer, and an organ of prehension. It is highly sensitive, and feels out food in the mud, where it is used with singular address. The skin, or coriaceous membrane covering the bone, especially along the margins of the mandibles, is freely supplied by branches of the fifth pair of nerves, which endow it with a discriminating sensibility. We have said that it is a strainer: the edges internally are laminated, or furnished with close-set transverse lamellæ, which are more developed in some species than in others. In the Shoveller Duck, for example, this lamination is highly developed, and presents the appearance in both mandibles of a fine pectinated or comb-like appendage, accompanied with great dilatation and depression of the front part of the bill, which is spatulate in form or outline. This pectination acts as a strainer, and reminds us of the plates of fringed whalebone on the palate of the Greenland whale.

In accordance with the sensibility and structure of the beak is the tongue modified. It is also a sensitive organ, and instead of being slender and horny, is large and fleshy, and furnished on its margin and other parts with fimbriations, or appendages. The tongue, in fact, in the *Anatinæ*, cooperates with the mandibles in the discrimination and appropriation of food.

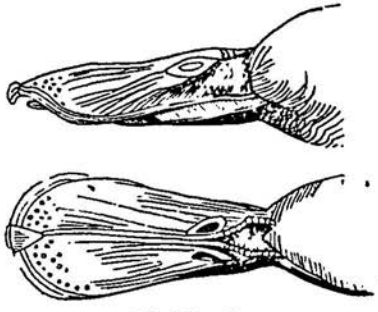
The peculiar action of the mandibles of the Duck, while probing in the mud for food, cannot have escaped observation. Yet the *Anatinæ* exhibit different modes of feeding, to say nothing of different partialities, according to the species. According to Skelton, the intelligent keeper of a decoy in Lincolnshire, and from whom Dr. Richardson obtained some interesting information, 'the mallard, pintail, and teal frequent rich flooded lands, *swittering with their nebs in the soil, and sucking out its strength;* but the widgeon feeds quite differently, being *an amazing fowl to graze*, a strange eater of grass.' It is especially fond of flutter grass (*Glyceria aquatica vel fluitans*), which it crops on the surface; but it likewise eats many other herbs. When the decoy has been so full of widgeons that they have devoured every blade on the landings, Skelton has taken advantage of their absence in the night, when they resort to the green salt marshes on the sea coast, and laid down sods pared from the fields, on which they readily graze. In common however with the mallard, teal, and pintail, they are fond of willow-weed, seeds (*epilobium?*) with which he feeds all the fowl in the decoy, as they prefer it to oats and every other kind of grain. In the 'Fauna Boreali Americana,' Mr. Waterton states that 'the Widgeon feeds by day, eating grass like a goose; whilst its congener, the mallard (wild-duck), invariably refuses this food, and seeks for its sustenance by night.'

We have said that the hind toe in the *Anatinæ* is free and simple, or not lobated; the three anterior toes are webbed, or united by a membranous expansion. The males are farther distinguished by a bony drum, or capsule, at the extremity of the trachea, near its bifurcation. The *Anatinæ* are universally distributed, and many species are common alike to Europe, Asia, Africa, and America. Most are migratory in their habits, and the flocks, during their aerial progress, assume definite figures, as lines or triangles, the leader giving place to others in succession. The males usually differ much from the females in plumage during the breeding season, but towards the close of the summer they lose more or less their distinctive livery, reacquiring it on the moult next ensuing. Most breed amidst the herbage of marshes, or along the borders of lakes, or sheets of water. Dr. Richardson observes that 'the *Anatidæ* are of great importance in the Fur Countries, as they furnish at certain seasons of the year, in many extensive districts, almost the only article of food that can be procured. The arrival of the water-fowl marks the commencement of spring, and diffuses as much joy amongst the wandering hunters of the arctic regions as the harvest or vintage excites in more genial climes. The period of their migration southward again, in large flocks, at the close of summer, is another season of plenty bountifully granted to the natives, and fitting them for encountering the rigour and privations of a northern winter. The *Anatidæ* have therefore very naturally been observed, both by the Indians and white residents of the Fur Countries, more than any other family of birds; and as they form the bulk of the specimens that have been transmitted to England, they are also better known to ornithologists. ('Fauna Boreali Americana.')

Genus *Spathulea*, Fleming (*Rhynchaspis*, Shaw; *Anas*, Swainson).

Example.—The Shoveller (*Spathulea clypeata*). This bird is the *Souchet* of the French; *Cucchiarone* of the Italians; *Schild-Ente* and *Löffel-Ente* of the Germans. The *Anas rubens* of Gmelin is regarded as the young male. In this genus

the beak is remarkable for its breadth anteriorly, its depression, its flexibility, and the fine and long lamination of the edges of the mandibles. The upper mandible overlaps the lower, and partially conceals it. Dertrum small and hooked.



Bill of Shoveller.

The Shoveller frequents marshes, lakes, and rivers, and is common in Europe, Asia, and North America. In all places it is a bird of passage, and arrives in the British Islands about October, and departs northward to its breeding haunts in March. Some few however breed in the marshes of our island. Its flesh is highly esteemed.

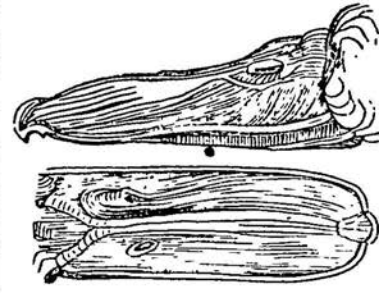
This form occurs in Australia: hence the genus is universal.

Genus *Malacorhynchus*, Swainson. Mr. Swainson ('Journal of the Royal Institution') observes, that among the broad-billed ducks of the southern hemisphere there is a remarkable modification of form. The breadth of the bill and the length of the laminæ are nearly the same; but the edge of the upper mandible, instead of being smooth, as in the European species, is furnished with a thin membranous skin, which projects considerably, and hangs down somewhat like a wattle on each side. For this form he proposes the generic name of *Malacorhynchus*.

Bill of *Malacorhynchus*.

Genus *Chauliodus*, Swainson (*Chaulelasmus*, G. R. Gray).

Example.—The Gadwall (*Chauliodus strepera*, Swainson). Bill of equal breadth, and depressed, with very fine, distinct, and numerous laminæ. Tail, wedge-shaped.



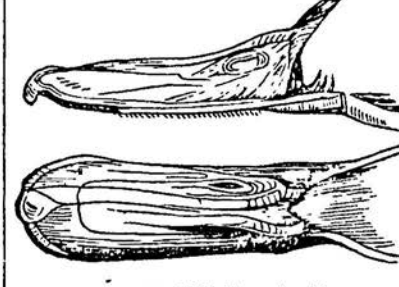
Bill of Gadwall (*Chauliodus*).

The Gadwall is rather a rare winter visitant to our island, but is abundant in Holland and along the coasts of France. In the former country it breeds in the marshes, as well as in more northern latitudes. This species is common in North America, where, as in Europe, it is migratory. It is the *Chipeau* or *Ridenne* of the French; *Anitra montanara* and *Anatra canapiglia* of the Italians; *Schwatter-Ente* of the Germans.

Genus *Dafila*, Leach.

Example.—The Pintail Duck (*Dafila caudacuta*). *Canard à longue Queue* or *Pilet* of the French; *Anatra di Coda lunga* of the Italians; *Spiess-Ente* of the Germans.

In this genus the bill is a little broader towards the tip than at the base; the laminæ are small, and almost concealed by the edge of the upper mandible. The tail is wedge-shaped, with the two middle feathers elongated and acute.

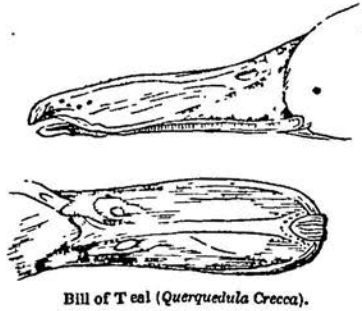


Bill of Pintail (*Dafila caudacuta*).

The Pintail Duck, or Sea Pheasant, is a regular winter visitant to our island, and is taken in abundance in the decoys of Lincolnshire, Norfolk, &c. It is met with in all the northern parts of Europe, Asia, and America, and returns in the summer to breed in high latitudes. It is shy and timorous, and rapid on the wing. Towards the end of summer the male acquires the plumage of the female, regaining his distinctive livery early in the succeeding spring. The flesh of this bird is excellent.

Pintail Duck (*Dafila caudacuta*).

Genus *Querquedula*, Stephens.
Example.—The Teal (*Querquedula Crecca*).
Bill as in *Dafila*. Tail wedge-shaped.



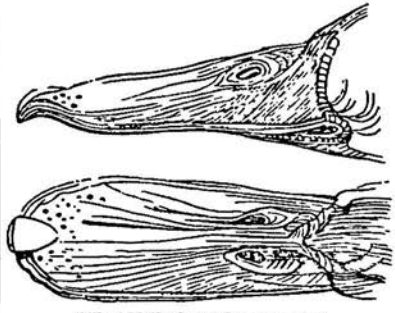
Bill of Teal (*Querquedula Crecca*).

This beautiful bird, one of the smallest of its family, is common over Europe and northern Asia; it also inhabits North America, according to Selby. Bonaparte however regards the American Teal as distinct. This species may be placed among our indigenous birds, as it breeds in our island, generally choosing the long rushy herbage about the edges of lakes, or the boggy parts of upland moors, as a situation for its nest. Vast numbers from more northern latitudes visit our island in winter and are taken in decoys. The flesh is very much prized at table. This bird is the *Petite Sarcelle* of Buffon; the *Crick-Ente* of Bechstein.

Genus *Anas*, Linn., Selby (*Boschas*, Swainson).

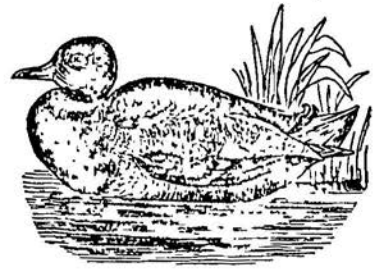
Example. — The Mallard, or common Wild Duck (*Anas boschas*). Bill depressed, broad; the breadth throughout being nearly equal; mandibles dentatolaminate. Tail somewhat wedge-shaped; in the male the two middle tail feathers are generally curled.

The Wild Duck is distributed through the temperate [illegible] Europe, Asia, and America. In the northern countries it is a bird of passage, and though numbers breed in our island, and the adjacent parts of the continent, it is rather to winter visitants from higher latitudes the decoy-keeper looks for his harvest, than to



Bill of Mallard (*Boschas domestica*).

home-bred flocks. As is the case with the Teal, the wild male loses in a great measure his distinctive markings towards the end of summer, acquiring a plumage not very different from that of the female, which he retains till the general moult. In the tame Drake, this change is not at all or but slightly perceptible. This species is the *Canard sauvage* of the French; *Cape verde* (the male) and *Anitra* (the female), of the Italians; *Wilde Ente* of the Germans.



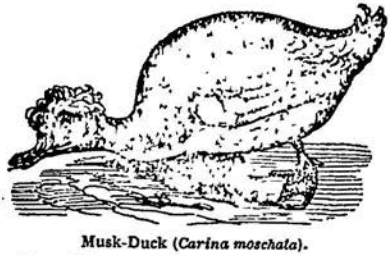
Wild Duck (*Boschas domestica*).

Genus *Carina*, Fleming (*Moschatus*, Lesson; *Moscha*, Leach; *Carina*, Eyton).

Example.—*Carina moschata*, or Musk Duck, erroneously, but frequently called the Muscovy Duck, now common in our island as a domestic tenant of the farm yard. The propriety of instituting a distinct genus for the reception of this species cannot be doubted. It differs from the common duck in the character of its plumage, in the caruncles at the bore of the beak, in the space of naked skin extending from the beak and encircling the eyes, and in the absence of curled tail-feathers in the male. Nevertheless it breeds freely with the common duck, and the hybrids, though not fertile with one another, will breed with either side of the two species from which they have sprung.

The Musk Duck (*Canard musqué* of Buffon) is a native of Guiana, Brazil, and other parts of South America. Margrave terms it '*Anas sylvestris, magnitudine Anseris*,' a wood-duck as

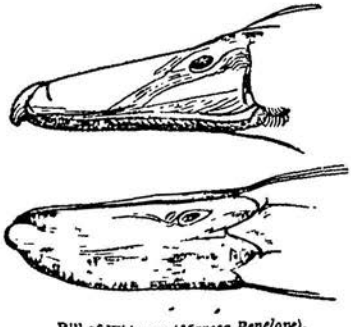
large as a goose. Ray calls it '*Anas sylvestris Braziliensis*,' the Brazilian Wood-Duck. According to Buffon this species was introduced into France in the time of Belon, about 1540. By this old writer the bird is termed '*Cane de Guinée*.' The male greatly exceeds the female in size, and is fierce and quarrelsome. The plumage is lax, the feathers large and not well compacted together, and the skin exhales a strong odour of musk.



Musk-Duck (*Carina moschata*).

Genus *Mareca*.

Example. — The Widgeon (*Mareca Penelope*, Selby; *Anas Penelope*, Linn.), *Le Canard Sifflieur* of Buffon; *Pfeif-Ente* of Bechstein. The Widgeons are distinguished from the Teals and the members of the genus *Anas* (*Boschas*, Swainson), by a much shorter and less cylindrical bill, and by its becoming narrower and more contracted towards the tip. The laminæ of the bill are also broader and set wider apart, approaching in form to those of the sub-family *Anserinæ*, or Geese. The Widgeons, instead of searching and sifting the mud with their bills in quest of insects, seeds, &c., subsist principally on grasses and vegetable diet, which they pluck in the same manner as geese. The tail is wedge-shaped and acute.

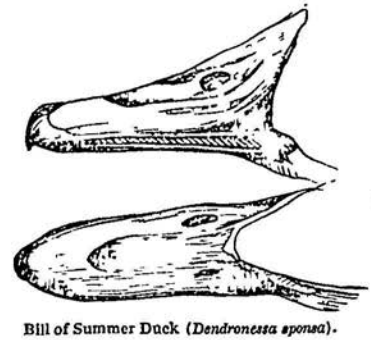


Bill of Widgeon (*Mareca Penelope*).

The Common Widgeon is a winter visitant to our island, and the temperate latitudes of continental Europe; and vast numbers are annually taken in decoys, for the sake of the fish, which, during the early part of the winter, is well flavoured. In America an allied species (*Mareca Americana*) represents its European relative.

Genus *Dendronessa*.

Example. — The Summer Duck (*Dendronessa sponsa*, Swainson). In this genus the bill is narrow at the tip, as high at the base as it is broad. Nostrils placed towards the middle of the bill. Tertial feathers ornamented.



Bill of Summer Duck (*Dendronessa sponsa*).

This beautiful little duck is confined to America, and ranges over the whole extent of the United States. It frequents fresh water only, and does not appear to be strictly migratory in its habits. It builds its nest in the hollows of trees, or in the hole made in some large branch by one of the larger woodpeckers. It breeds freely in captivity; but in its wild state, is it shy and recluse, preferring the secluded retreats of the ponds, bayous, or creeks in the woods.

Summer Duck (*Dendronessa sponsa*).

Another species of this genus is the Chinese Duck or Chinese Teal (*Dendronessa galericulata*), which divides the palm of beauty with the Summer Duck. It is a native of China, but breeds freely in our aviaries. Like the Summer Duck it is arboreal in its habits, and roosts on trees. According to Mr. G. Bennett, it is much admired by the Chinese.

For details relative to the *Anatinæ*, see Selby's 'British Ornithology;' Yarrell's 'British Birds;' Gould's 'Birds of Europe;' the 'Fauna Boreali-America;' Wilson's 'American Ornithology;' and Audubon's 'Biographical Ornithology.'

For the rest of the families or sub-families of the great genus *Anas*, or family *Anatidæ*, see FULIGULINÆ, GEESE, MERGANINÆ, SWANS.

Fossil Anatinæ. Dr. Buckland ('Bridgewater Treatise') mentions and figures the duck, *Anas* (the figure represents the common wild duck), among the land mammifers and birds of the third period of

the tertiary series, and he observes that many of the genera there enumerated occur both in the second, third, and fourth formations of the tertiary series, and also in caverns, fissures, and diluvium. Thus, among the remains found in the Kirkdale Cave ('Reliquiæ Diluvianæ') he enumerates and figures the right coracoid process of the scapula of a small species of duck or widgeon. Dr. Buckland also observes that the eggs of aquatic birds have been preserved in the lacustrine formations of Cournon, in Auvergne. (See Croizet and Jobert, 'Recherches sur les Oss. Foss. du Départ. du Puy-de-Dome,' &c.)

DUCLOS, CHARLES PINEAU, was born in 1704, at Dinant, in Bretagne, whence he went to Paris. He there published a Romance called 'Acajon et Zirphile;' and another, entitled 'Confessions du Comte de * * *,' was very successful. His reputation however depends on a collection of moral essays, published under the title of 'Considérations sur les Mœurs de ce Siècle,' which have been greatly extolled by many writers. In 1739 Duclos was admitted into the Academy of Inscriptions, and in 1747 into the Académie Française, of which he became perpetual secretary. He continued to reside at Paris, where he died in 1772. The romances and essays have been collected into 4 vols., 8vo., under the title of 'Œuvres Morales et Galantes.' Duclos also wrote a history of Louis XI., and a secret history of Louis XIV. and XV.

DUCTILITY is the property of bodies which admits of their being drawn out in length, while their diameter is diminished without any actual fracture. Gold, silver, platinum, iron, copper, zinc, tin, lead, nickel, are ductile in the order here given. Wire-drawing depends on ductility.

DUDLEY. [WORCESTERSHIRE.]

DUELLING. The rise of the practice of duelling in modern times is to be referred to the trial by battle which obtained in early ages, jointly with the single combat or tournament of the age of chivalry, which again most probably owed its own existence to the early trial by battle. The trial by battle, or duel (as it was also called), was resorted to, in accordance with the superstitious notions of the time, as a sure means of determining the guilt or innocence of a person charged with a crime, or of adjudicating a disputed right. It was thought that God took care to see that, in every case, innocence was vindicated and justice observed. The trial by battle was introduced into England by William the Conqueror, and established in three cases; viz., in the court-martial or court of chivalry, in appeals of felony, and in civil cases upon issue joined in a writ of right. Once established as a mode of trial, the duel was retained after the superstition which had given rise to it had died away, and was resorted to for the purpose of wreaking vengeance, or gaining reputation by the display of courage. Then came the age of chivalry, with its worship of punctilio and personal prowess, its tilts and tournaments; and the duel, originally a mode of trial established by law, became a practice dependent on fashion or certain conventional rules of honour.

The trial by battle in appeals of felony and writs of right was only abolished in 1819. An appeal of felony had been brought in the previous year, in a case of murder, and the appellee had resorted to his right of demanding wager of battle. (Ashford *v.* Thornton, 1 Barn. and Ald. 405.) [APPEAL.]

The law of England makes no distinction between the killing of a man in a duel and other species of murder; and the seconds of both parties are also guilty of murder.

The following three new articles of war were issued in the course of 1844, with a view to the abatement of duelling in the army:—

1. Every officer who shall give or send a challenge, or who shall accept any challenge to fight a duel with another officer, or who, being privy to an intention to fight a duel, shall not take active measures to prevent such duel, or who shall upbraid another for refusing or for not giving a challenge, or who shall reject, or advise the rejection, of a reasonable proposition made for the honourable adjustment of a difference, shall be liable, if convicted before a general court-martial, to be cashiered, or suffer such other punishment as the court may award.

2. In the event of an officer being brought to a court-martial for having acted as a second in a duel, if it shall appear that such officer had strenuously exerted himself to effect an adjustment of the difference on terms consistent with the honour of both parties, and shall have failed through the unwillingness of the adverse parties to accept terms of honourable accommodation, then our will and pleasure is, that such officer shall suffer such punishment as the court may award.

3. We hereby declare our approbation of the conduct of all those who, having had the misfortune of giving offence to, or injured or insulted others, shall frankly explain, apologize, or offer redress for the same; or who, having had the misfortune of receiving offence, injury, or insult from another, shall cordially accept frank explanations, apology, or redress for the same; or who, if such explanations, apology, or redress are refused to be made or accepted, shall submit the matter to be dealt with by the commanding officer of the regiment or detachment, fort or garrison; and we accordingly acquit of disgrace, or opinion of disadvantage, all officers and soldiers who, being willing to make or accept such redress, refuse to accept challenges, as they will only have acted as is suitable to the character of honourable men, and have done their duty as good soldiers, who subject themselves to discipline.

DUET (*Duetto*, Ital.), a musical composition for either two voices or two instruments.

DUFRESNE. [CANGE, DU.]

DUFRESNOY. [FRESNOY, DU.]

DUGDALE, SIR WILLIAM, was born at Shustoke, in Warwickshire, September 12, 1605. He was in part educated in the free-school at Coventry, and subsequently with his father, with whom he also read Littleton's 'Tenures,' some other law-books, and history.

Dugdale early adopted the study of the antiqui-

ties of his country, and having been introduced into the Herald's College as pursuivant-at-arms in 1638, he ascended through several of its dignities until he became at length Garter King-at-Arms, in 1677, on which occasion he was also knighted. This connexion he found and made largely available in the compilation of his many antiquarian works, as it gave him access to the records, not only in the college, but in the Tower and elsewhere.

His first large work was making, under the patronage of Sir Christopher Hatton, exact drafts of all the monuments in Westminster Abbey, St. Paul's Cathedral, and in several other cathedrals and parochial churches. The drawings made under his direction by W. Sedgwick, with the inscriptions copied by himself, were deposited in Hatton's library. On the breaking out of the civil wars, Dugdale joined the king's party. He was at the battle of Edgehill, and with the king at Oxford, until the surrender of the city to the parliament in July 1646. While at Oxford, where he became M.A. in 1642, he searched the Bodleian library for materials for his 'Monasticon,' which had been then projected by Roger Dodsworth and himself, as well as for his 'Baronage.' Having compounded for his estate, Dugdale went to London; where he and Dodsworth proceeded vigorously in completing their collections from the Tower Records and Cottonian library. Dodsworth and Dugdale printed the first volume at their own charge, which was published in 1655, in folio, under the title of 'Monasticon Anglicanum,' adorned with the views of abbeys, churches, &c. The second volume was published in folio, in 1661. A third volume was published in 1673.

Abridgments of and additions to the 'Monasticon' have subsequently been published. The last improved edition was completed in 1830, in six volumes folio, the last volume divided into three parts. Many valuable additions have been made in this edition, which was prepared by John Caley, esq., of the Augmentation Office, and Sir Henry Ellis, principal librarian of the British Museum.

In 1656 Dugdale published, at his own charge, 'The Antiquities of Warwickshire,' folio, London. This is one of the very best of our county histories. Other editions, revised and augmented, have been since published. While this work was printing, Dugdale remained in London, during which time he had an opportunity of collecting materials for another work, which he published in 1658, 'The History of St. Paul's Cathedral, in London,' folio. Of this also a third edition was given to the world in 1818, by Sir Henry Ellis. The plates of the original editions, both of the 'Warwickshire' and the 'St. Paul's,' were by Hollar. To the last two editions of the 'St. Paul's' a life of Dugdale was prefixed.

Dugdale wrote and published many other works, but the most important one was the 'Baronage of England,' of which the first volume appeared in 1675, and the second and third in 1676, folio. Upon this work he had spent thirty years of labour; and though the corrections to be made in it are numerous, it remains one of the best works which exist as a foundation of English history.

Dugdale died February 10, 1686, and was interred at Shustoke. His epitaph in Latin, written by himself, is inscribed upon a tablet near the spot of his interment.

An account of his other works, and of his MS. collections, will be found in his *Life, Diary, and Correspondence*, edited by William Hamper, Esq., 4to., London, 1827.

DUGONG. [WHALES.]

DUISBURG. [DÜSSELDORF.]

DUKE, the title given to those who are in the highest rank of nobility in England. The order is not older in England than the reign of king Edward III. Previously to that reign those whom we now call the nobility consisted of the barons, a few of whom were earls. Neither baron nor earl was in those days, as now, merely a title of honour. The barons were the great tenants in chief, and the earls important officers. It does not appear that in England there was ever any office or particular trust united with the other titles of nobility, viscount, marquis, and duke. They seem to have been from the beginning merely honorary distinctions.

The English word duke is from the French *Duc*, which originally was used to signify 'a man of the sword (a soldier) and of merit, who led troops.' The remote origin is the Latin *dux*, a 'guide,' or a 'military commander.' The word is used by the Latin writers to signify generally any one who has military command, but sometimes 'dux,' as an inferior officer, is contrasted with 'imperator,' commander-in-chief. Under the Lower Empire, dux was the title of a provincial general, who had a command in the provinces. In the time of Constantine there were thirty-five of these military commanders stationed in different parts of the empire, who were all *duces*, or dukes, because they had military command. Ten of these dukes were also honoured with the title of comites, or counts. [COUNT.] (Gibbon, 'Decline and Fall,' &c., cap. 17.)

The first person created a duke in England was Edward, Prince of Wales, commonly called the Black Prince. He was created duke of Cornwall in parliament, in 1335, the eleventh year of king Edward III.

The whole number of dukes in the English peerage is at present twenty, exclusive of the blood royal. There are seven Scottish dukes (Argyll, Atholl, Buccleuch, Hamilton, Lennox, Montrose, and Roxburgh), of whom two (Lennox and Hamilton) are also English dukes. The only Irish duke is the duke of Leinster.

All the dukes of England have been created by letters patent, in which the course of succession has been plainly pointed out. Generally the limitation is to the male heirs of the body.

DUKER, CHARLES ANDREW, was born at Unna in La Marck, in the year 1670. About the year 1700 he became professor of history and eloquence at Herborn, in Nassau. He [illegible] wards under-master in the school at [illegible] and in 1716 joint professor (with D[illegible]

of history and eloquence at Utrecht. In 1734 Duker gave up his professorship and retired to the country. He died at Meyderic on the 5th of November, 1752. Duker is best known by his edition of Thucydides, published at Amsterdam 1731 (fol.), which was, till Bekker's appeared in 1821, by far the best edition of that author. His edition of Florus, 1722, is valuable.

DULCIMER, a very ancient musical instrument, supposed to be the psaltery of the Hebrews. In the modern form, it is a trapezium in shape, has many strings, two to each note, and is struck by a pair of sticks with wooden or metallic knobs.

DULVERTON. [SOMERSETSHIRE.]

DULWICH. [ALLEYN; BOURGEOIS.]

DUMBARTON, or DUNBARTON, the chief town of Dumbartonshire, and an ancient royal burgh, is situated on the western bank of the Leven, not far from its junction with the Clyde, about 15 miles W.N.W. from Glasgow, and 52 W. from Edinburgh. The town consists of one tolerably well built street. The chief manufacture is crown glass and glass bottles. At high water the Leven is navigable for large vessels to the quay at Dumbarton. About 40 small vessels belong to the port. Population of the town, 3782. Dumbarton Castle stands on a steep rock, rising up in two points, and inaccessible on every side, except by a very narrow passage fortified with a strong wall or rampart. Within this wall is the guard-house, with lodgings for the officers, and from hence a long flight of stone steps leads to the upper part of the castle, where there are several batteries mounted with cannon, the wall being continued almost round the rock. There is an excellent well constantly supplied with water. The rock on which the castle stands is nearly surrounded with water, and presents a highly interesting view from the Clyde, whose waters wash its base. Considered as the key to the Western Highlands, this castle was always a great object of contention, and has sustained many memorable sieges. It is now garrisoned by some invalids, under the command of a governor and some subaltern officers.

DUMBARTONSHIRE, a small county in Scotland, between 55° 53′ and 56° 20′ N. lat., and 3 55′ and 4° 53′ of W. long. It consists of two separate parts, having an intervening distance of 6 miles between their nearest approaching points. The larger and western part is bounded on the west by Loch Long, by which it is separated from the county of Argyle; the southern boundary is formed by the river Clyde, the eastern by the county of Stirling, and the northern by Perthshire. It is about 36 miles in length from N.W. to S.E. in a straight line, and in the middle about 15 miles in breadth from E. to W. Loch Lomond is not wholly included within the county. The small detached eastern part is half enclosed by Stirlingshire on the north, and by Lanarkshire on the south, and measures 12 miles from E. to W., and about 4 miles from N. to S. The whole area of the county is 260½ square miles, or 167,040 acres, of which about 20,000 acres are water. Two-thirds of the surface consist of mountains, partially presenting woods, mosses, and moors, and incapable of cultivation. The most remarkable mountains are Ben Voirlich, Arrochar, Benequirach, Luss, Row, and Roseneath; the precipitous summits of which are frequently covered with snow. Ben Voirlich, in the northern extremity of the county, and near the northern extremity of Loch Lomond, is 3300 feet above the level of the sea. There are many highly picturesque situations in this county. The contrast of sterile mountains and verdant glens is very striking. Loch Lomond presents the richest description of lake and highland scenery. Its length is 22 miles. It is studded with many beautiful little islands, and its finely wooded shores are adorned with elegant villas. The climate is in general mild. Yet the lateness of the spring, the frequency of showers and cloudy weather during harvest, with blighting mountain winds in the spring and autumn, and the early commencement of winter, are insuperable disadvantages to agriculture; but for pasturage, and especially for the growth of timber, the climate is remarkably well adapted; nor is it unfavourable to health. The natural copse woods and plantations cover several thousand acres, and consist of oak, ash, yew, holly, mountain ash, birch, hazel, aspen, alder, crab, thorn, and willow. The comparative extent of arable land is very small; it is chiefly clay, and lies mostly on the south of Loch Lomond, and along the Clyde. The prevalent soils are clay, gravel, black loam, and a small portion of bog. Potatoes, oats, and wheat, are the principal crops. The cattle are chiefly of the West Highland breed. Cows of the Ayrshire breed have been introduced into most of the dairy farms. The sheep are of the small black-faced mountain breeds. Farms are of very various extent, but chiefly small. The principal mineral production is coal, of which there is a large field, but of inferior quality, which is wrought at Langfauld, in the southern extremity of the county. In the eastern division of the county iron-stone is dug, and conveyed on the Clyde and Forth Canal to the great iron-foundry at Carron. Some large quarries of limestone and of freestone are worked. There are also several slate quarries.

On the banks of the Leven are numerous and very extensive works for cotton-printing, and bleaching fields, the pureness of the Leven Water being peculiarly adapted for this process. This stream, which, with the exception of numerous mountain torrents, is the only one worthy of notice, runs rapidly a distance of about 7 miles from Loch Lomond to the Clyde at Dumbarton Castle, and is navigable for lighters. Some large iron works are established at Dalnotter; there are also extensive and prosperous manufactories of glass and paper. Dumbarton is the chief town. [DUMBARTON.] The county sends one representative to parliament. The population in 1841 was 44,296.

DUMBNESS. [DEAF AND DUMB.]

DUMFRIES, the county town of Dumfriesshire, a royal burgh, and a parliamentary borough contributory to the Dumfries district, is pleasantly situated on the east bank of the Nith, 9 miles above its influx into the Solway Frith. The town

is well built and clean, and lighted with gas. The houses are of red freestone, the older houses being whitewashed, and many of the modern ones painted in imitation of Portland stone. There are two parish churches, and eight places of public worship for different classes of dissenters. In the middle of High Street is the Mid Steeple, the work of Inigo Jones, where the town-council hold their meetings. The other public buildings are—the Trades' Hall, Theatre, Dumfries Academy, Infirmary, Dispensary, Poor-House, County Gaol, Bridewell, a Doric column erected to commemorate the virtues of a Duke of Queensbury, and a mausoleum in St. Michael's churchyard to the memory of Burns. The manufactures of the town are hats, stockings, shoes, clogs, and leather. The Nith is crossed at Dumfries by two bridges, of which the Old Bridge dates at least as far back as the reign of Edward I. It formerly consisted of 13 arches, of which however only 7 remain, and it is used exclusively by foot-passengers. The New Bridge is a little higher up the river than the Old Bridge, and was built in 1794. The channel of the river has been deepened within these few years, and vessels of a good size can discharge their cargoes close to the town. There is also a quay at the bend of the river near Castledykes; one for vessels of greater burthen a mile and a half farther down; and another near the mouth of the river for vessels of still larger size. The foreign trade is in timber from America. The coasting trade is with Liverpool, Whitehaven, Maryport, and other places on the west coast of England. A steam-boat plies once a week in the summer months between Whitehaven and Dumfries, in connection with one between Whitehaven and Liverpool. The number of vessels registered Jan. 1, 1848, was 121 (8366 tons). Population of the town, 10,069. Dumfries returns one member to parliament, in conjunction with Annan, Kirkcudbright, Lochmaben, and Sanquhar, the total population of the district being 21,628.

DUMFRIESSHIRE is a southern county of Scotland, lying between 55° 2′ and 55° 31′ N. lat., and between 2° 39′ and 3° 53′ W. long. It is bounded S. by the Solway Frith and Cumberland, N. by the counties of Lanark, Peebles, and Selkirk, E. by Roxburgh, and W. by Kirkcudbrightshire and Ayrshire. Its form is irregularly ellipsoidal: the greater diameter, from Liddel Mount to Corsincone Hill, measures about 50 miles; the lesser diameter, from the Solway to Loch Craig, about 32 miles. The area is 1016 square miles, or 644,385 acres. The county was formerly divided into three districts, Annandale, Eskdale, and Nithsdale, each comprehending a portion of territory which fell within the basins of the three rivers after which they are named; the Esk on the east, the Nith on the west, and the Annan in the centre of the county. In 1841 the population was 72,830. Considerable numbers emigrate to America and other places.

Surface, Hydrography, &c.—The surface of the county is very irregular. About half of it is mountainous, a small part is on the sea-coast, and one-third is upland, consisting of low hills, ridges, and vales. [illegible] the highest mountain in the county, is 3300 feet above the level of the sea. In the vicinity of Lochmaben are nine lakes or lochs, five of which are of considerable size. The mountain lake called Loch Skeen, situated near the head of Moffat Water, is 1300 feet above the level of the sea, and about 2 miles in circumference. There are several other lochs or lakes of less extent. The lakes are all abundantly stocked with various kinds of fish.

The principal rivers in the county are the Nith, Annan, and Esk. The Nith enters the county from Ayrshire, runs S.E. in a very winding course above 40 miles, and falls into the Solway Frith. The Annan takes its rise near the sources of the Clyde and Tweed, among the mountains near the junction of Lanarkshire and Peeblesshire with Dumfriesshire, runs a course nearly S. of about 30 miles, and enters the Solway Frith a little below the town of Annan. The Esk rises in the mountains on the borders of Selkirkshire, runs in a S. direction about 30 miles in the county, passes Langholm and Canobie, enters Cumberland, and turns W., and flows through an open country by Longtown into the Solway Frith. The Kirtle is a romantic little river that enters the Solway Frith a little distance from the Sark, which is a border stream, and forms the boundary between England and Scotland for some distance before it enters the Solway Frith. The Lochar is a moss rivulet, which runs about 13 miles in a very serpentine course, and discharges itself into the Solway Frith, a few miles east of the mouth of the Nith.

Game-birds of various kinds are very plentiful, particularly pheasants, black game, grouse, and partridges. The woodcock, curlew, plover, lapwing, and snipe, are also abundant.

Geological Character.—The southern and lower part of the county consists of reddish-coloured sandstone, which becomes of a lighter colour and harder quality towards the north. Proceeding farther northward, a reddish-coloured limestone, succeeded by a coarse white sandstone and blue limestone, appears, and after these mandlestone rock and primitive mountains containing metallic ores. Coals are wrought only at the two extremities of the county, Sanquhar and Canobie. A great portion of the county is supplied with coal from Cumberland, and from Lanarkshire and Ayrshire. The old red sandstone appears in the bed of the Annan, near Jardine Hall. At Wanlockhead, near Leadhills, are extensive lead-mines. From this lead silver is extracted in the proportion of six to twelve ounces in the ton. Gold is occasionally found in the mountains at Wanlockhead, in veins of quartz, or washed down into the sand of the rivulets. Gypsum occurs in thin veins. The rocks of many of the hills consist of greenstone, and of grauwacke and grauwacke slate. Floetz-trap is found on the summit of some of the mountains. Boulders of granite and sienite are found in various places. There are several basaltic or whinstone rocks, the finest of which are met with in the mountains in the vicinity of Moffat. Sulphurous, chalybeate, and other mineral waters, are resorted to in several parts of the county.

Climate and Agriculture.—That part of the

county which adjoins the Solway Frith is low and warm. The mountainous district is cold and bleak, but seldom remains long covered with snow. The whole of the county is supposed to be moist, and in general mild and salubrious. Wood is much wanted in the county, particularly on the higher ridges, both for use and ornament; and draining would be a most important improvement. At a moderate expense not only Lochar Moss, but several other extensive tracts of wet and mossy ground might be drained and converted into valuable meadows and corn-fields. The soil in the lower parts of the county is generally light and sandy. Along the margins of the great rivers are considerable tracts of rich alluvial soil. Peat-moss prevails on many of the hills, and in some of the vales: the most extensive moss is that of Lochar, near Dumfries, which is 10 miles long, and from 2 to 3 miles in breadth. Clay is found extensively as a sub-soil, and in a few places as a soil mixed with other substances. In Annandale and Nithsdale the dry soil prevails. On many of the hills the soil is naturally wet. A variety of crops are now cultivated, and the practice of farmers with respect to rotation is various. Oats and potatoes are cultivated more extensively than any other crop, both for home consumption and for exportation. A great quantity of hams and bacon of the very best quality are cured in this county, and sent off to the Liverpool, London, and Newcastle markets. The very general adoption of the culture of turnips has been one of the greatest improvements in the agriculture of the county. Bone manure is used with advantage upon high ground of difficult access. The farm implements in use are very similar to those in Cumberland, with the exception of the sickle, the use of which is in some places much laid aside, and the scythe substituted for it. The horses in general are of a middle size, and are the result of many crossings of different breeds. The quality of the cattle and sheep stocks has been lately much improved. The Galloway breed of cattle mostly prevails, except for the dairy, for which business many intelligent farmers prefer cows of the Ayrshire breed. The sheep are of the Cheviot and black-faced breeds. A great number of pigs are kept by the farmers and cottars, and bacon may be considered a staple commodity of the county. Sheep farms vary in size from 300 to 3000 acres, and two sheep for three acres may be considered an average number of stock. Arable farms extend from 50 to 600 acres; many are about 100 to 150 acres. Arable land in a good situation lets from 2*l.* to 5*l.* per acre, but about 1*l.* per acre may be considered an average of the county for arable lands, and 4*s.* for sheep-walk. Most of the modern farm buildings are commodious and well arranged; they are constructed of stone and lime, and generally covered with slate.

Divisions, Towns, &c.— There is no division of the county for political purposes, but within its limits are four royal burghs, Dumfries, Annan, Lochmaben, and Sanquhar. The natural division is into the districts or dales of Nithsdale, Annandale, and Eskdale. The synod of Dumfries extends over the whole county, and also over a part of some other counties. The county sends one member to parliament, and the burghs of Dumfries, Annan, Kirkcudbright, Lochmaben, and Sanquhar join in electing another representative.

The following are the principal towns, with the population of each in 1841:—

Annan is situated on the east bank of the river Annan, near the Solway Frith, 15 miles E. by S. from Dumfries. The town is well built. The road from Carlisle to Dumfries runs through the principal street. The church and the town-house have each a handsome spire. A stone bridge of three arches was erected in 1824 in place of the old wooden one. The harbour is formed by a creek of the Solway Frith at the mouth of the river, and can be entered by vessels of 250 to 300 tons burthen, and vessels of 60 tons burthen can sail up the river to the bridge at Annan. Jetties have been formed, where steamers plying between Liverpool and Carlisle call regularly to take in cattle, horses, sheep, goods, and passengers. About 40 vessels (about 1700 tons) belonging to Annan are employed, of which two or three are in the American timber trade, and the rest in the coasting trade. Annan is a royal burgh, and is contributory to the Dumfries parliamentary district. It is supposed to have been a Roman station. Population of the town, 4409.

Graitney or *Gretna Green*, a neat small village, about 7 miles E. from Annan, long celebrated for the clandestine marriages of fugitive lovers, is situated within a mile of the English border. Population of the parish, 1308.

Langholm is a well built town delightfully situated in the midst of some picturesque woodland and mountain scenery on the banks of the Esk. It consists of one principal street, in which is a town-hall and jail in the market-place. The village of New Langholm is on the opposite side of the river. The castle, now in ruins, has only been a square tower. There is an old church, two dissenting meeting-houses, an endowed school, and a savings-bank. Population of the town of Old Langholm, 1305; of the village of New Langholm, 1057.

Lochmaben is a very ancient burgh and market town seated on the west bank of the Annan. It consists chiefly of one broad street. The town-hall, under which is the jail and lock-up-house, was built in 1745. A handsome and substantial new church was erected in 1819. It is contributory to the Dumfries parliamentary district. The castle, now in ruins, has been a place of great strength, the fortifications covering nearly 16 acres. Population of the burgh, 1330.

Lockerbie is a market-town situated between the rivers Annan and Milk, 12 miles N. by E. from Dumfries. There is a good parish church and an antiburgher meeting-house. Population of the town, 1513.

Moffat, a watering-place, stands near the east bank of the river Annan, 20 miles N. by E. from Dumfries. It is protected on the N.E. by a screen of lofty mountains. Here are elegant baths, assembly-rooms, a church and burgher meeting-house, a subscription and a circulating library. The sulphureous water of Moffat contains 4 cubic inches

of nitrogen gas in the wine gallon, 5 cubic inches of carbonic acid gas, 10 cubic inches of sulphuretted hydrogen gas, and 36 grains of sulphate of soda. The chalybeate water of Hartfell, 5 or 6 miles N. by E. from Moffat, contains 5 cubic inches of azotic gas in a wine gallon, 84 grains of sulphate of soda, 12 grains of sulphate of alumina, and 15 grains of oxide of iron. The sulphureous water is found of great service in scrofula, cutaneous eruptions, and bilious complaints; the chalybeate water in disorders of the stomach and bowels. Population of the town, 1413.

Sanquhar, a royal burgh, is seated on the Nith, 27 miles S.W. from Dumfries. It has a handsome church, erected in 1820, and three dissenting places of worship; a prison, savings-bank, and a subscription library. The castle is a very picturesque ruin. Population of the town, 1638. Sanquhar is contributory to the Dumfries parliamentary district.

Antiquities, History, &c.—The remains of Druidical temples exist in three or four parishes. Near Moffat are vestiges of a British encampment and also of a Druidical temple. A Roman way has extended from Carlisle by Gretna. This way afterwards divided into two branches, one of which took the route of Nithsdale, and the other of Annandale. They united again at or near Crawford Castle. Another Roman way led from Carlisle by the station at Netherby and Liddel Strength through Canobie into Teviotdale. Several fortifications, both of a circular and square form, and some large Roman encampments can be distinctly traced in various parts of the county. There are ruins of many old towers, vestiges of forts, and a great number of cairns in different places. Several ancient castles still remain in Dumfriesshire. Among the remains of ancient castles, one of the most interesting is that of Caerlaverock, which, before the invention of gunpowder, was a place of vast strength, though without rock, or river, or swamp, or any other natural means of defence. It is situated near the shore of the Solway Frith, and not far from the eastern side of the mouth of the Nith. The form is triangular, and it is surrounded by two moats. It stood several sieges, of which one of the most formidable was by Edward I.

The Selgovæ were the most ancient inhabitants of this county. In the time of the Romans, Dumfriesshire formed a part of the Roman province of Valentia [BRITANNIA]; and after the Romans had relinquished Britain it constituted a portion of a new kingdom founded by Ida and the Angles. In the eighth century it was under the dominion of the Picts, who dismembered Galloway and Dumfriesshire from the Northumbrian monarchy. Until the reign of James VI. this county was the scene of many battles and of many a feud and foray, which were often occasioned by the jealousies of the rival chieftains. Being seated on the borders it was also liable to the incursions of the English.

(Dr. Singer's *General View of the Agriculture, &c., of the County, of Dumfries; New Statistical Account of Scotland; Communication from Dumfriesshire.*)

DUMONT, E'TIENNE, was born at Geneva in July, 1759. In his twenty-second year he was ordained minister of the Protestant church in Geneva. He left Geneva in the spring of 1783, on account of the political changes there, and he betook himself to St. Petersburg, where he assumed the charge of the French Protestant church. He stayed in that city eighteen months, when he was invited to London by Lord Shelburne, afterwards the Marquis of Lansdowne, to undertake the education of his sons. In Lord Shelburne's house he made the acquaintance of Fox, of Romilly, of Lord Holland, and most of the other distinguished members of the Whig party; and with Romilly in particular he formed a strong friendship. In 1788 Dumont and Romilly visited Paris together, and it was on the occasion of this visit, which lasted only two months, that Dumont first became acquainted with Mirabeau.

In 1789 Dumont made a second visit to Paris, in order to negotiate with M. Necker, for the liberty of Geneva and the return of her exiles. He stayed in Paris until 1791, and the acquaintance previously formed with Mirabeau ripened into intimacy. We learn from Dumont's posthumous work, entitled 'Souvenirs sur Mirabeau,' that Mirabeau frequently availed himself of the assistance of Dumont and Duroverai, especially the former, in the preparation of speeches and reports.

It was not until Dumont's return to England in 1791 that his intimacy and co-operation with Mr. Bentham commenced. [BENTHAM]. Admiring Mr. Bentham's talents, and impressed with the importance of his pursuits, he craved leave to arrange and edit those writings on legislation which their author would not himself publish. The following are those of Mr. Bentham's works which were edited by Dumont: 1. 'Traités de Législation,' 3 vols., published in 1802. 2. 'Théorie des Peines et des Recompenses,' 2 vols., in 1811. 3. 'Tactique des Assemblées Législatives,' in 1815. 4. 'Preuves Judiciaires,' 2 vols., in 1823. 'Organisation Judiciaire et Codification,' in 1828.

In 1814 Dumont returned to Geneva, which had then recovered its independence. He was elected a member of the representative council of Geneva, and, having been appointed on a committee that was to draw up laws and regulations for the council, he was the author of the plan that was ultimately adopted. Under his auspices, a penitentiary establishment was erected at Geneva in 1824, on the Panopticon plan of Mr. Bentham. Dividing his time between his senatorial duties and the publication of those of Mr. Bentham's works which have been named, he lived a useful and a happy life to the age of sixty. He died suddenly in the autumn of 1825, while travelling in the north of Italy

DUMOURIEZ, CHARLES FRANÇOIS, was born at Cambrai in 1739. He entered the army at an early age, and served in Germany during the Seven Years' War; and was afterwards employed as an envoy to Poland and to Sweden by Louis XV., whose ministers however, becoming jealous of him, caused him to be lodged in the Bastile by a lettre-de-cachet, whence he was released by Louis XVI. on his coming to the throne, and

in 1778 he furnished the ministry with plans for the conquest of the islands of Jersey, Guernsey, and Wight. At the beginning of the revolution he took the popular side, and became connected with the Girondins, by whose interest he was appointed minister of foreign affairs, in which capacity he prevailed upon the king to declare war against Austria in April, 1792. Soon after, he left office, upon the dismissal of the other Girondin ministers, Roland, Servan, Clavière, &c. He withdrew himself from internal politics, and went to serve under General Luckner on the northern frontiers. After the 10th of August he was appointed to replace La Fayette in the command of the army which was opposed to the Duke of Brunswick, and by his masterly stand in the forest of Argonne, by which he gave time to Kellermann and other generals to come up and win the battle of Valmy, September 20, 1792, was the means of saving France from a successful invasion.

At the end of October, Dumouriez began his campaign of Flanders; gained the battle of Jemmappes against the Austrians, 5th and 6th November; took Liege, Antwerp, and a great part of Flanders; but after the execution of the king, Dumouriez determined to support, on the first opportunity, the re-establishment of the constitutional monarchy under the son of Louis, and for that purpose, opened a communication with the Prince of Coburg, who had gained some advantages over him. The convention soon suspected him, and sent four commissioners, with Camus at their head, to summon him to Paris, but Dumouriez seized the commissioners, and sent them over to the Austrian general Clairfait, at Tournay, to be detained as hostages.

His design was now to march upon Paris, but his troops, and especially the volunteers, refusing, he was obliged to take refuge himself, with a few officers, at the Austrian head-quarters, April, 1793. He was now disavowed and neglected or persecuted by all parties. He at length, about 1805, settled in England, where he afterwards chiefly resided. He died in March, 1823, at Turville Park, near Great Marlow, at the age of eighty-four. (*Mémoires du Général Dumouriez*, 3 vols. 8vo., written by himself.)

DUN-LE-ROI. [CHER.]

DÜNA, a river in Russia, rises from several springs in the south-western part of the government of Tver. It winds in a direction generally W. until it has passed Vitepsk, a little above which it becomes navigable for flat-bottomed craft; from this town it turns N.W., in which direction it flows till its entrance into the Gulf of Riga, below Fort Dünamunde, after a course of about 655 miles. The navigable portion of the Düna is about 405 miles in length, but the navigation, owing to rapids and variableness of depth in the river, is difficult and dangerous. At Riga its breadth is about 3000 feet. It contains several islands and abounds in fish. The chief tributaries of the Düna are—the Toroptsa, the Ulla, the Kaspliu, the Ke[illegible], the Mejna, the Disna, and the Dolder Aa. The Narofna, which joins the Düna on its right bank, can be regarded only as an outlet for lake Peipus.

DÜNABURG. [VITEPSK.]

DUNBAR. [HADDINGTONSHIRE.]

DUNBAR, WILLIAM, is supposed to have been of the family of the Dunbars, earls of March, but neither his father nor the date of his birth are known with certainty. In 1475 he was sent to the university of St. Andrews, where he passed bachelor of arts, in St. Salvator's college there, in 1477; and in 1479 master of arts. He afterwards entered the monastic order of St. Francis; and in the habit of a friar travelled not only throughout the south of Scotland, but also in England and on the continent. We know little of his after-life, but from his own writings it appears he was often employed in missions by James IV., and his name occurs in the treasurer's and other accounts as the receiver of pensions and gifts on various occasions. The last is in 1510, a letter under the privy seal, increasing his pension to 80*l.* a year, till provided with a benefice of 100*l.* or upwards. This he enjoyed till the king's death at Flodden, in Sept. 1513, after which Dunbar's name no more appears, though it is supposed that he lived till 1520.

Dunbar's writings now extant are not numerous, but they exhibit an amazing versatility of genius, from grave to gay, from witty to severe. But it is in description that he shows his various powers most conspicuously. Thus, in his 'Golden Terge,' as in 'The Thistle and the Rose,' we have imagery brilliant and dazzling. In the 'Dance of the Deadly Sins in Hell,' the same creative ability appears. 'The Feigned Friar of Tungland' and 'The Justs between the Taylor and the Souter' display the same power of vividly portraying character, mingled with bitter sarcasm and biting satire.

DUNBLANE. [PERTHSHIRE.]

DUNCAN, ADMIRAL. Adam Duncan was born in 1731, at Dundee, of which his father was provost in 1745. He entered the navy in 1746, was made post-captain in 1761, and distinguished himself in several actions, especially in that of Cape St. Vincent. In 1787 he became a rear-admiral, and seven years afterwards was appointed to command in the North Seas. In this service he watched the mouth of the Texel, where a large Dutch fleet lay at the time of the mutiny at the Nore. By skilful manœuvring, although deserted by every ship except one ('Adamant,' 50), he detained them until he was joined by the rest of the fleet, and, on their leaving port, cut off their retreat, and brought them to action at Camperdown, where he captured nine sail of the line and two frigates. For this service Admiral Duncan was created a viscount and received the thanks of parliament. He died suddenly, August 4, 1804.

DUNDALK. [LOUTH.]

DUNDEE, a royal burgh, parliamentary borough, and seaport, in Scotland, is situated on the north shore of the Frith of Tay, in 56° 27′ N. lat., 2° 56′ W. long. The town stands on a gentle acclivity, rising from the water's edge towards a high hill called the Law. The average depth of water in the harbour is 17 feet at spring tides, and 11 feet at neap tides. The æstuary opposite the town is nearly two miles wide, but the navigation of the channel is much interrupted by a sand-bank near the centre, which extends about a mile

parallel to the course of the river. Dundee was a place of importance as far back as the reign of Edward I. In 1731 there were 70 vessels belonging to the port, of an aggregate burthen of 2309 tons. And in 1815 the renovation and extension of the harbour gave an impulse to its manufactures and commerce, which has led to its present state of prosperity. The harbour now consists of a wet dock of about six acres, a tide-harbour of much larger extent, a graving-dock, yards for ship-building, &c.

The greater part of the town is well built, and improvements are in course of rapid extension, both in the town and harbour. New and spacious streets have been opened, and narrow lanes removed. The supply of water however is somewhat deficient. There are several handsome public buildings, among which may be mentioned the Town-Hall, to which the Gaol is attached; the Trades' Hall; the Exchange Coffee-Room; the Academy; the Royal Infirmary; and the Royal Lunatic Asylum. Near the centre of the town are the principal parish churches, four of which are grouped together so as to form externally one edifice, with a lofty and massy tower at the western end, the whole presenting an appearance which is very imposing. Eight churches and chapels are in connection with the church of Scotland, and several others belong to different classes of dissenters from it. The Watt Institution, for the instruction of young men in science and art, was established in honour of James Watt. From 80 to 90 schools in Dundee supply instruction to about 4000 children. In the Grammar-School two masters teach Latin and Greek. There are several banks, a gas company, and other companies for commercial purposes.

The chief manufactures of Dundee consist of the spinning of flax, for which there are from 30 to 40 mills, the weaving of linen, and the making of cordage and ropes. Besides the fine linen, a large quantity of sail-cloth is woven.

The population of the burgh of Dundee in 1841 was 60,551. The population of the parliamentary borough, which returns one member to the House of Commons, was 62,873.

A complete oval of railroad extends from Dundee to Perth, Cupar, Forfar, and Arbroath, and so round again to Dundee, with a line from Dundee through the centre of the oval, thus forming the whole into two connected circles.

The number of registered sailing vessels, Jan. 1, 1848, was 329 (51,637 tons); steam-vessels, 7 (1380 tons). In the coasting trade, the sailing-vessels, Jan. 1, 1847, to Jan. 1, 1848, were, inwards, 2231 (160,230 tons); outwards, 1057 (78,824 tons); steam-vessels, inwards, 59 (22,437 tons); outwards, 61 (23,570 tons). In the colonial and foreign trade, the sailing-vessels were, inwards, 686 (110,995 tons); outwards, 40 (5045 tons).

Steam-vessels ply regularly between Dundee and Perth, Newport, Leith, Glasgow, London, and other places.

(*New Statistical Account of Scotland.*)

DUNFERMLINE. [FIFESHIRE.]

DUNGANNON. [TYRONE.]

DUNGARVAN. [WATERFORD.]

DUNKELD. [PERTHSHIRE.]

DUNKERQUE, (*Duyn Kerche, Dunkirk*), a seaport town and fortress in the department of Nord in France, stands at the junction of the canals of Bergues, Bourbourg, and Furnes, in 51° 2′ N. lat., 2° 22′ E. long., 174 miles N. by E. from Paris, and has 27,047 inhabitants. It is said to owe its origin to a chapel founded by St. Eloi, which, from its situation among the sandy downs of the coast, got the name of Duyn Kerche, which in Flemish means 'the church of the downs.' In the 10th century it was raised by Baudouin III., count of Flanders, from a mere village to the rank of a town. Charles V., to whom the town had come by inheritance along with the rest of Flanders, built a castle to defend the port, which has been since demolished. In 1558 the English, who had rendered themselves masters of the town, were driven from it by the French; but in the following year it was given up to the Spaniards. In 1646 it was taken from the Spaniards by the French under the duke of Enghien (afterwards the Great Condé); but it fell again shortly after into the hands of the Spaniards. In 1658 Turenne, having defeated the Spaniards, took Dunkerque, which, according to a treaty previously concluded with Cromwell, was put into the hands of the English: four years afterwards Charles II. restored it to France on condition of receiving for it a considerable sum of money. Louis XIV., by the fortifications he erected, enabled the town to repel an attempt made by the English to bombard it in 1695. By the peace of Utrecht, the fortifications were razed and the port filled up. At the peace of Aix-la-Chapelle the port and fortifications, which had been partially restored in the previous war, were again demolished; but by the peace of 1783 they were allowed to be restored. In 1793 the town was besieged by the allies under the Duke of York; but the French soon obliged the besiegers to retire with great loss.

Dunkerque is nearly three miles in circuit. The streets are broad and well paved; the houses are well built of brick. The public squares are spacious, handsome, and regular. The principal of these are the Champ-de-Mars and the Place Jean-Bart, which is planted with trees, and ornamented with a statue of Jean Bart. [BART.] The fortifications consist of the ramparts, surrounded by ditches, of Fort Louis and the Citadel. The principal buildings are—the church of St. Eloi, which, though a gothic structure, has a handsome Corinthian portico; the detached belfry in front of this church; the town hall; the barracks and naval storehouses; the tower of the port, on which there is a lighthouse; the college, theatre, and concert rooms. The only supply of water is from cisterns. The market is abundantly supplied with poultry, vegetables, and other kinds of provisions. The immediate neighbourhood is dreary and uninteresting.

The inhabitants are engaged in the manufacture of soap, starch, beer, beet-root sugar, cordage, and leather: there are metal foundries, gin distilleries, salt-works, and ship-building yards. As this port serves as the outlet for the great manufacturing department of Nord, the trade by sea is very

considerable. The harbour is large and safe, but of rather difficult entrance. The cod and herring fisheries are prosecuted with great activity; and the town has a considerable trade in Bordeaux wines and brandies.

Dunkerque has tribunals of first instance and of commerce, a chamber of commerce, a public library of 18,000 volumes, an exchange, a college, a school of navigation, and two hospitals. Foreign consuls reside at Dunkerque. A railway is now in course of construction from the town, which will join the Paris and Brussels Railway, a little E. of Arras.

DUNMANWAY. [CORK.]

DUNNING, JOHN, LORD ASHBURTON, was born at Ashburton, in Devonshire, October 18, 1731. He was removed from the free-school at Ashburton, and articled to his father, an attorney, as a clerk, in the thirteenth year of his age. He was afterwards induced to study for the bar, and entered of the Middle Temple, May 8, 1752. He was called to the bar July 2, 1756.

It was not till 1761 that he was enabled to distinguish himself; but in 1763 his argument in Combe *v.* Pitt, in which he was unexpectedly called in the absence of his leader, and the question of general warrants, throughout the whole of which litigation he was employed as the advocate of his friend Wilkes; and the argument on the Bill of Exceptions (June, 1765) afforded him an opportunity of establishing his reputation. After this his business rapidly increased: he was shortly chosen recorder of Bristol, and in December, 1767, appointed solicitor-general.

In the following year he entered parliament as one of the nominees of Lord Shelburne for the borough of Calne, under whose guidance he supported the policy of the Whig party with much ability; and was rewarded accordingly on their coming into power with the title of Lord Ashburton in 1782, a pension of 4000*l.* a year, and the chancellorship of the duchy of Lancaster. He died however in August 1783.

DUNOIS, a district of the old province of Orleanois in France, of which the capital was Châteaudun. It is now comprehended in the department of EURE-ET-LOIR.

DUNS SCOTUS, JOHN, was born probably about the year 1265. The English, the Scotch, and the Irish, have all claimed him as a countryman. The Scotch say he was a native of Dunse in Berwickshire, and in that village they still pretend to show the house where he was born. Mackenzie ('Lives of Scottish Writers,' i. 215) says that he was descended from the family of the Dunses in the Merse. Camden conceives he was called Scotus because descended from Scottish parents; and the addition of the name Scotus may imply that he was so called to signify that, though born in another country than Scotland, he was of Scottish origin.

It seems however to be agreed that he was chiefly educated in England. He is said to have been found when a boy tending his father's cows by two Franciscans, who were greatly struck with his intelligence; and by the monks of this order he was first instructed in the elements of learning, and then sent to Merton College, Oxford, of which he became a fellow. While a student, he is said to have become greatly distinguished for his proficiency in theology, in logic and metaphysics, in civil and canon law, in mathematics, in natural philosophy, and in astronomy. In 1301, on the removal of William Varron to Paris, he was appointed to the theological chair. His prelections were attended by crowds of auditors, the number of students at Oxford at this time, it is affirmed, exceeding 30,000, which is manifestly a great exaggeration. In 1307 Duns removed from Oxford to Paris, in which city he had on a visit some time before distinguished himself in an extraordinary manner by his defence, in a public disputation, of the doctrine of the immaculate conception of the Virgin Mary. On this occasion, it is said, there was formally conferred on Scotus the title of the Subtle Doctor (Doctor vel Magister Subtilis), by which he is commonly distinguished. He taught in his new chair with as much applause as at Oxford; but in 1308 he was ordered by the general of his order to remove to Cologne to found a new university there. On reaching Cologne he was met by nearly the whole body of the citizens, and drawn into the city in a triumphal car. On the 8th of November, in this same year, he was carried off by a fit of apoplexy. Some accounts make him to have died in his 43rd, others in his 34th year.

In 1639, his collected works appeared at Lyon, in 12 vols., folio A complete copy of this collection is exceedingly rare. It is dedicated to Philip IV. of Spain, and the editor is Luke Wadding, an Irishman. It does not however, as has been often stated, contain all the works of Scotus, but only those designated his 'Opera Speculativa,' the 'Positiva,' if they should be completely recovered, having been intended to form a future publication. The principal pieces of which it is composed are Questions or Commentaries on the Sentences of Peter Lombard, and on the physical, logical, and metaphysical writings of Aristotle. The following are enumerated by Wadding as the 'Opera Positiva' of Scotus: 'Tractatus de Perfectione Statuum' (of doubtful authenticity); 'Lectura in Genesim;' 'Commentarii in Evangelia;' Commentarii in Epistolas Pauli;' 'Sermones de Tempore;' and 'Sermones de Sanctis.' We are not aware that any of these treatises have ever been printed.

The admirers of Scotus extol his acuteness and subtlety as unrivalled, and he has always been accounted the chief glory of the Franciscans, as Thomas Aquinas has been of their rivals the Dominicans. If in his short life he actually wrote all the works that are commonly attributed to him, his industry must have been prodigious. His fame during his lifetime, and long after his death, was not exceeded by that of any other of the scholastic doctors. From him and Aquinas two opposing sects in theology took the names of Scotists and Thomists, and divided the schools. In philosophy the Scotists are opposed to the Occamists, or followers of William Occam, who was himself a pupil of Scotus, but differed from his master on the subject of Universals or general

terms, which the Scotists maintained to be expressive of real existences, while the Occamists held them to be nothing more than names. Hence the Scotists are called Realists, the Occamists Nominalists.

Wadding has prefixed to his edition of the works of Scotus an elaborate Life of the author, which was reprinted at Mons in 12mo, in 1644.

DUNSTABLE. [BEDFORDSHIRE.]

DUNSTAN, SAINT, was born of noble parents at or near Glastonbury, in Somersetshire, in the first year of the reign of Athelstan, A.D. 925. He was carefully instructed in the learning of his time, became a priest, and still early in life was introduced by his uncle, Aldhelm, archbishop of Canterbury, to Athelstan's court. He however soon retired to a sort of hermitage at Glastonbury, where his devotional austerities, his learning, and skill in many manual arts, so raised his reputation, that, on the succession of Edred to the throne in 948, Dunstan was withdrawn from his retirement and invested with almost unlimited authority by the king. Dunstan had already rebuilt and restored the abbey of Glastonbury, and he now imported into England a new order of monks, the Benedictines, who, by changing the state of ecclesiastical affairs, excited, on their first establishment, the most violent commotions. Upon the death of Edred, and succession of Edwy, Dunstan was accused of malversation in his office, was deprived of his abbacy, and banished the kingdom in 955. Edgar, however, who succeeded in the following year, restored him to Glastonbury, having promoted him first to the see of Worcester; he then made him bishop of London; and in 959 advanced him to the archiepiscopal see of Canterbury; and shortly afterwards he was appointed the papal legate in England. So absolute was his influence that he was enabled to give the Romish see an authority and jurisdiction of which the English clergy had been before, in a considerable degree, independent. The secular clergy were excluded from their livings and disgraced; and the monks were appointed to supply their places. The scandalous lives of the secular clergy furnished one plea for this measure, and it was not altogether groundless; but the principal motive was that of rendering the papal power absolute in the English church. During the whole reign of Edgar, Dunstan maintained his interest at court; and upon Edgar's death in 975 his influence served to raise Edward, Edgar's eldest son, to the throne. Whilst Edward was in his minority Dunstan ruled with absolute sway both in church and state; but upon the murder of that prince in 979, and the accession of Ethelred, his credit and influence declined. He died of grief, May 19, 988. A volume of St. Dunstan's works was published at Douay in 1626.

DUNWICH. [SUFFOLK.]

DUODECIMALS, a term applied to arithmetical fractions in which each denomination is the twelfth part of that which precedes. Such fractions were once used for the parts of a foot, in continuation of the inch.

DUODE'NUM (from a Latin word signifying twelve, because it is twelve inches in length), the first of the small intestines in immediate connection with the stomach. It commences at the pyloric end of the stomach, and terminates at the distance of twelve inches in the second portion of the small intestines called the jejunum. It is in the duodenum that the biliary and pancreatic fluids are mixed with the food, and it is probably an organ accessory to the stomach. There is evidence that it carries on the digestion commenced in the stomach. It is certain that alimentary substances which have escaped solution in the stomach are dissolved in the duodenum.

DUPLEX QUERE'LA (double querele or complaint), a process in ecclesiastical causes, in the nature of an appeal from the ordinary to his next immediate superior, as from a bishop to an archbishop, or from the archbishop to the king in council. (Burn, *Eccles. Law.*)

DUPLICATE RATIO, a termed used by Euclid, and defined as follows:—If A be to B in the same proportion as B to C, then the ratio of A to C is called the duplicate ratio of A to B. When A, B, and C are lines, the duplicate ratio of A to B is that of the square on A to the square on B: when numbers, that of A times A to B times B.

DUPLICATION OF THE CUBE, is the solution of the following problem: to find the side of a cube which shall be double the size of another cube. This question, which is insoluble with perfect exactness by the methods of ordinary geometry, attained such a degree of notoriety among the Greek geometers that its origin was the subject of a mythologic fable. Eutocius, has preserved a letter in which it is said that Euripides had introduced Minos erecting a sepulchre to Glaucus. The architect proposed one hundred palms every way, on which Minos declared that such a size would be too small for a royal sepulchre, and required that it should be doubled in size; and thereupon arose the difficulty. Eratosthenes also states another fable, namely, that the Delians, during a pestilence, had been ordered by the oracle to produce a cubical altar double of one which then existed. They applied to the school of Plato at Athens, who found that the problem eluded all their efforts.

Eutocius has mentioned the solution of Eudoxus, and has preserved those of Plato, Hero, Philo, Apollonius, Diocles, Pappus, Sporus, Menæchmus, Archytas, Eratosthenes, and Nicomedes. Pappus himself (in the third book, the first of those which remain entire) has preserved the solutions of Eratosthenes, Nicomedes, and Hero. In several instances these notices are the only clue which we have to the dates of the investigators, as there is strong presumption that those who are named by Eutocius and not by Pappus lived between the two.

The importance of this problem declined with the rise of arithmetic. Many different attempts were made, some avowedly mechanical (as opposed to geometrical), others by those who imagined they could overcome the original difficulty. Any process for the solution was called [illegible] (a term as old as Vitruvius).

DUPONCEAU, PETER S., LL.D., was born in the Ile de Rhé, in France, probably between 1750 and 1760. When he had finished his studies in his native province, he went to Paris to follow literature as a profession. In 1777, the Baron de Steuben, who was about to proceed to America as a volunteer in the insurrectionary war, took Duponceau with him as secretary and aide-de-camp. Duponceau served four campaigns in the American army, and after the peace of 1783 was appointed to a subordinate situation in the foreign office. In this line of employment he continued till the beginning of the present century, when he adopted the law as a profession. After some years' practice at the bar he retired, and devoted himself to literary researches. These particulars we learn from a notice prefixed to Duponceau's 'Mémoire sur le Systeme Grammatical des Langues de quelques Nations Indiennes de l'Amérique du Nord,' by M. J. B. B. Eyriès, under whose care the work was printed, in 8vo., at Paris, in 1838. This Mémoire contains an account and examination of the languages of what the author denominates the Algonquin races, or the tribes calling themselves the Chippeways or Ojibbeways. These form, according to Duponceau, one group of the Indian tongues of North America, as those of the Iroquois, the Sioux, the Esquimaux, and the aborigines of Florida, severally form other groups or families. Duponceau's examination is very elaborate, and gained him much reputation. He was made a correspondent of the Institute, and elected member of several other European literary societies, as well as president of the American Philosophical Society. He wrote several other works, of which the principal was 'A Dissertation on the Nature and Character of the Chinese System of Writing,' 8vo., Philadelphia, 1838, of which the object is to refute the common notion that the Chinese written characters do not in any sense represent words, but only ideas, and the inference thence deduced, that they may be read and made use of by other nations who do not understand the Chinese spoken language—as, for instance, by the Japanese and Coreans. Duponceau died at Philadelphia, April 2, 1844.

DUPUIS, CHARLES-FRANÇOIS, was born of poor parents, at Fryé-Château, between Gisors and Chaumont, on the 26th of October, 1742. Profiting by the lessons and the friendship of Lalande, he entered upon the study of astronomical history with a zeal which never abated till the close of his life. His attention was especially directed in the first place to the probable signification of the astronomical symbols which constituted the signs of the zodiac; and thence to all the other ancient constellations.

In 1777 and 1778 he published in the 'Journal des Savans' the first sketches of the theory at which he had arrived; and shortly after, both in the astronomy of his friend Lalande, and in a separate volume under the title of 'Mémoire sur l'Origine des Constellations et sur l'Explication de la Fable par l'Astronomie,' 1781. The sceptical tendency of the views entertained by Dupuis led Condorcet to recommend him to Frederick the Great, as professor of literature in the College of Berlin, and successor to Thiébault; and the offer was accepted by Dupuis. The death of Frederick, however, prevented the arrangement from being carried into effect; but the chair of Latin eloquence in the College of France becoming then vacant by the death of Bejot, he was appointed to fill it. He became a member of the French Convention, &c., but his political career presents nothing remarkable.

In 1794 he published his great work entitled 'Origine de tous les Cultes, ou la Religion Universelle,' 3 vols. 4to., with an Atlas. In 1798 he published an abridgment of the 'Origine' in one vol. 8vo., or rather a series of extracts from his large work, under the same title; but a much more methodical abridgment was shortly after given to the world by Destutt-de-Tracy.

The wildly displayed hatred towards Christianity which so strongly developed itself during the eventful period of the French revolution was well calculated to create deep interest in the work of Dupuis. He had been led to conclude that the earliest traces of the general mythology of the southern climates would be found in Upper Egypt, if indeed they had not their origin there. In this celebrated work, therefore, originated the 'Commission' to explore the ruins of that country, which was undertaken by Napoleon after his return from Italy.

The Zodiac of Tentyra (or Denderah) engaged much of the attention of Dupuis, upon which he published a Mémoire and an Explication, in the 'Revue Philosophique' for May 1806, which he afterwards published in an enlarged and separate form in one volume 4to., under the title of 'Mémoire Explicatif du Zodiaque Chronologique et Mythologique.' In this curious dissertation he compares the Greek and Egyptian Zodiacs with those of the Chinese, the Persians, the Arabs, and all the others of which he could obtain any distinct notices.

Dupuis died at Is-sur-Tille, on September 29, 1809, aged 67. He was a man of strict probity, and much esteemed by his friends for his personal qualities. He amassed no fortune, being satisfied to expend his income upon the materials for his researches.

He left in MS. a work on cosmogonies and theogonies, intended as a defence and illustration of the doctrines of the 'Origine des Cultes.' There is also reason to believe that it was in consequence of conversations with Dupuis that Volney composed his work on the 'Ruins of Empires.'

Dupuis has been often stigmatised as a paradoxical writer. Bold and speculative he was, but there is certainly little cause to call him paradoxical. His conjectures are often plausible, though his deductions from them are frequently inconsequential. Whatever might have been the immediate effect of his scepticism, there can be little doubt that the ultimate effect has been alike favourable to early history and to the Christian religion. He was a sincere and candid man, and always appeared to be fully impressed with the truth of the conclusions at which he had arrived. It

was indeed that earnestness of character that gave so much weight to his opinions and so much influence to his suggestions. Had this feature been wanting in the character of Dupuis, the expedition to Egypt had never been undertaken, nor, consequently, would the brilliant discoveries to which it finally led have been made.

DUPUYTREN, GUILLAUME, Le Baron, was born at Pierre-Buffière, a little village of the department of Haute-Vienne, in France, October 5, 1777 or 1778. His parents were poor, and at the age of three years he was stolen from them by a lady of rank, who wished to adopt him as her son. He was however returned to his parents, and received his early education at the college of Magnac-Laval. During one of the college vacations, whilst he was playing in his native village when a troop of cavalry passed through, one of the officers was much struck with the appearance of young Dupuytren, and being pleased with his answers to his questions, obtained his own and his parents' consent to take him with him to Paris, and to educate him. The officer had a brother in the Collège de la Marche, under whose care Dupuytren was placed. Here he had a brilliant career, and determined on pursuing medicine as a profession. He commenced the study of pharmacy under Lagrange and Vauquelin, and also attended the dissecting room. During this period he always commenced his work at four o'clock in the morning, and his means were very scanty.

In the year 1794 he obtained the office of prosector in the new school of medicine formed under Fourcroy. His emolument was barely sufficient to keep him in health.

Up to this time morbid anatomy had only been pursued in the same manner as descriptive anatomy. Little had been done towards regarding the appearances of bodies after death as the result of certain definite actions in life. Dupuytren saw this, and devoted himself with ardour to pathological anatomy. He however determined to connect this branch of inquiry with surgery. The results of his labour were not however published by himself, but appeared in a work by M. Marandel, entitled 'Essai sur les Irritations,' Paris, 1807.

In 1803 Dupuytren took his degree in the faculty of medicine. On this occasion he wrote a thesis on some points of anatomy, physiology, chemistry, and pathological anatomy. This thesis contained important statements of facts and deduction. It was published in Paris in 1804. The same year a society was also constituted in the faculty of medicine for the purpose of discussing and publishing papers on medical subjects. From 1804 to 1821 this society published seven volumes, under the title 'Bulletin de la Faculté de Médecine de Paris, et de la Société établie dans son Sein,' 8vo. The bulletins were drawn up by Merat and Dumeril, and contain a great number of reports and memoirs which had been communicated to the society by Dupuytren. Among the most important were papers on the influence of organic lesions on health, and on the cause of death to workmen in drains. The result of his researches on this last subject led to important alterations in the construction of drains, &c., so as to secure a more perfect ventilation, and thus the frequent occurrence of death amongst the workmen has been prevented.

The same year, 1803, a vacancy having occurred in the office of assistant-surgeon at the Hôtel Dieu, Dupuytren was a candidate. This office was given to Dupuytren after examination by public concours. Dupuytren succeeded Sabatier in the chair of surgery at the Hôtel Dieu. In 1815 he was transferred to the chair of clinical surgery, which he held till his death. In 1818 he was advanced to the post of senior surgeon to the Hôtel Dieu.

Although it would be difficult to point out a single department of surgery or morbid anatomy on which the views, opinions, and observations of Dupuytren are not known, yet he has left no record of these in works written by himself. During the twenty years however that he held the office of professor of clinical surgery at the Hôtel Dieu, his lectures were published in the various French medical periodicals, and many courses have been also published in the English medical periodicals.

The improvements introduced by Dupuytren in the treatment of surgical diseases were always founded on his great anatomical and pathological knowledge, and modern surgery owes much of its success to his exertions. In the department of practical surgery he was eminently successful; he possessed almost entire control over his feelings; and, with great anatomical knowledge, accuracy of perception, and perfect steadiness of manipulation, his operations were regarded as the most successful of the surgical staff of the Parisian hospitals. His presence of mind never forsook him; and the difficulties and accidents which must sometimes occur in operative surgery were always made subservient to the instruction and guidance of the pupils. During his career as an operative surgeon he invented many instruments.

His performance of his duties, as surgeon and clinical teacher, was remarkable. Although he had one of the largest private practices in Europe, and accumulated through it probably the largest fortune ever made by a medical man, he never neglected his public duties. He spent from four to five hours every morning in visiting his patients at the Hôtel Dieu, performing operations, making post-mortem examinations, giving clinical instruction, and in consultations. Every evening he returned to the hospital at six, for the purpose of visiting the worst cases and performing urgent operations. These severe duties he never intermitted, even during sickness, and when suffering from attacks of disease These labours, however, at last told upon even his iron constitution, and in November, 1833, he first gave symptoms of decay. On the 5th of that month he was seized with a slight attack of apoplexy, which lasted only a short time, but left behind it a difficulty of speaking, as well as an inclination of the mouth towards the right side. He still continued his duties at the Hôtel Dieu; but his friends at last persuaded him to make a journey to Naples. He remained in that city till May, 1834. On his return he resumed his visits and lectures at the hospital, and struggled on a little longer. He died

Feb. 8, 1835. He retained his intellectual faculties to the last.

In his will he left the bulk of his enormous fortune, amounting to 280,000*l.* to an only daughter. He also left 200,000 francs for the purposes of endowing a chair of pathological anatomy. This sum being found larger than was necessary to endow merely the chair, a certain portion of the income has been appropriated to maintaining, in connection with the chair, a museum of pathological anatomy, which is called the Musée Dupuytren. He was buried in the cemetery of Père la Chaise.

DURA MATER. [BRAIN.]

DURA'MEN, the name given by physiologists to the central wood or heart-wood in the trunk of an exogenous tree. It is the oldest part of the wood, and is filled by the secretions of the tree, so that fluid can no longer ascend through its tubes, which are choked up by the deposition of solid matter; otherwise it is of the same nature as the alburnum. It is only where plants form solid hard secretions that heart-wood is distinguished from sap-wood: in the poplar, willow, lime, &c., no secretions of this kind are formed; the two parts of the wood are both nearly alike, and consequently the timber of such trees is uniformly perishable.

DURANCE. [ALPES. BASSES.]

DURAND, JEAN NICOLAS LOUIS, Professor of Architecture at the Ecole Polytechnique, was born at Paris, September, 18, 1760. His father was a poor shoemaker, but the talent of young Durand acquired friends, who first placed him with a sculptor, and afterwards with Panseron the architect (author of 'Elémens d'Architecture,' Paris, 1772). Under him, his advance was exceedingly rapid; and within the course of about two years he became draughtsman to Boulée, the King's architect. While with Boulée, he also attended some of the courses of instruction at the Académie Royale d'Architecture, where he became one of the competitors, and in 1780 obtained the great prize. In 1793 the demand on the part of the National Convention for designs for public edifices of utility or embellishment, proposed to be erected in various parts of France, afforded Durand and Thibaud (who had become strongly attached to each other while both were with Boulee) an opportunity of displaying their talents upon a variety of subjects. Durand however practised scarcely at all during the latter and greater portion of his life; for on being appointed to the professorship at the Ecole Polytechnique, which he held for forty years, he gave himself up almost entirely to its duties, and to the self-imposed task of providing works of instruction for the pupils, and also the profession in general. Of these the most celebrated as a 'show-book,' is th 'Recueil et Parallèle des Edifices de tous Genres,' 1800, consisting of eighty-six plates of oblong or double folio size, and forming a sort of historical gallery or museum of architecture. The 'Recueil' itself contains no text, but Legrand's 'Essai sur l'Histoire Générale de l'Architecture' was published as an accompaniment to it in a separate octavo volume. Durand's other works were, the 'Précis des Leçons d'Architecture,' 2 tom. 4to., and 'Partie Graphique des Cours d'Architecture,' &c., 4to., Paris, 1821. He died at Thiais, in the neighbourhood of Paris, December 31, 1834.

DURAND, NICOLAS. Little is known with certainty of the life of this architect, but he was born, it is said, in Paris, in 1738, and was still living in 1824 at Châlons-sur-Marne. He was considered one of the best architects of his time, and built the Hôtel de la Préfecture (1758), and the Porte Dauphine (1769) at Châlons; and at Langres the Hôtel de Ville (1772), the Hôtel Dieu (1774), and the Dominican Convent, which last is commended by Wiebeking as one of the best buildings of that period in France.

DURANGO. [MEXICAN STATES.]

DURA'ZZO, the ancient *Epidamnus*, a town in the Turkish Pashalik of Skutari, is situated in 41° 22′ N. lat., 19° 27′ E. long., on the eastern coast of the Adriatic, a little S. of Cape Pali. Epidamnus was a colony of Corcyra, but it afterwards changed its name into *Dyrrhachium*. It fell under the Romans at the time of the conquest of Macedonia, and its harbour became the principal means of communication between Italy and the north parts of Greece, Macedonia, and Thrace. It is now a place of little importance; the population, which amounts to only 5000, carry on some trade by sea, and export the surplus corn which grows abundantly in the neighbouring plains. The town is the residence of a Greek and a Roman Catholic archbishop.

DÜREN. [RHEIN-PROVINZ.]

DÜRER, ALBRECHT, was born at Nürnberg, May 20, 1471. He was the son of a goldsmith, who gave him an excellent education, and instructed him in his own art, but, at the desire of his son, placed him under the most able painter of his native country, Michael Wohlgemuth (1486). After finishing his apprenticeship he set out on his travels, went through Germany, and visited Holland and Italy, where he executed some of his best pictures, such as the Martyrdom of St. Bartholomew, for the church of St. Mark; and Adam and Eve, for the German Church in Venice, which was afterwards bought for the Gallery of Prague. In Bologna he became acquainted with Raphael, who esteemed him highly. In token of their friendship, each presented the other with his portrait. He returned home in 1507, with the reputation of being the first painter of his country. His industry and perseverance were great, and his productions are numerous, but it is stated that he was unhappy in his domestic relations, and he died broken-hearted, April 6, 1528, in the 58th year of his age. The senate of Nürnberg decreed him a public funeral.

Dürer's paintings are admired for the vivid and fertile imagination, the sublime conception, and the wonderful union of boldness and correctness of design which they display. Besides his great historical paintings, the best of which are in the collections of Vienna, Prague, Munich, and Dresden, Dürer has left some landscapes that are highly valued. Some of his paintings were in England, in the collection of Lord Arundel. Dürer was also an excellent engraver in copper

and wood; his woodcuts are masterpieces of the art, and considered equal to those of Hugo da Carpi.

Dürer wrote several valuable works on geometry, perspective, and fortification. He bestowed such labour on the purity of his native tongue, that his writings even now are well worth the study of the German scholar.

D'URFEY, THOMAS, was born in Devonshire, but the exact time of his birth is uncertain. He died in 1723, and was buried at St. James's, Westminster. D'Urfey was the author of some dramas, more remarkable for their indecency than any better quality, but his principal fame rests on his songs and satirical odes, which he is said to have himself sung in a lively and agreeable manner. A collection of D'Urfey's poems, entitled 'Pills to purge Melancholy,' is extremely rare, and sells for a high price.

DURHAM, an English county, is bounded N. and N.W. by Northumberland, W. by Cumberland and Westmoreland, S. by Yorkshire, and E. by the German Ocean. Its greatest length, from E. to W., is 48 miles; its greatest breadth, from N. to S., is 39 miles. The area is 1097 square miles, or 702,080 acres. The population in 1841 was 324,284. Three are three detached portions of Durham in Northumberland, and one in Yorkshire.

Coast, Surface, Hydrography, &c.—The coast of the county of Durham is for the most part low, especially in the detached portions. In the main portion of the county there are several ranges of cliffs, which are of magnesian limestone, except those at Seaton Bents, which are formed of new red sandstone. Holy Island, about 4 miles long by 2 broad, is connected with the main land by a sand-bank, which is exposed at low water. The Farne Islands, consisting of several islets, or rocks, on two of which are lighthouses, lie a little S.E. of Holy Island.

Durham may be characterised as a hilly county. The western part is overspread by the branches of the great Penine Chain, from the eastern slope of which the chief rivers of the county flow. There are several elevations from 1000 to 2000 feet high, and one (Kilhope Law) 2196. Large portions of the mountain district consist of moorlands covered with heath. The moors are chiefly used as sheep pasturage.

The Tyne forms the northern boundary of the county for about 18 miles. Its Durham affluents are the Derwent, Team, Stanley, and Hedworth; and it is navigable for about 15 miles. The Wear rises near Kilhope Law, and flows through the wild and romantic district of Weardale, past Stanhope, Wolsingham, Bishop Auckland, Durham, and Chester-le-Street, to its junction with the German Ocean at Sunderland. It is about 65 miles long, and navigable for 20 miles. It is crossed at Sunderland by a fine bridge of one arch 236 feet span, and 100 feet above the river. It receives numerous streams, all of which are very small. The Tees rises at Cross Fell in Cumberland, and passes by Barnard Castle, Darlington, and Stockton, to its wide æstuary in the German Ocean. Its length is 85 miles; it receives a great number of tributaries, and has many picturesque falls. The other rivers of Durham are all small.

There is only one short canal in the county. The great north road to Scotland traverses the county. Among the earliest railways in the kingdom were those of Durham, for conveying coals from the collieries to the sea-side. But besides these, there is now a complete network of passenger railways: most of which (except the Clarence and Hartlepool and the Stockton and Darlington) form parts of the York and Berwick Railway.

Geology, Soil, Agriculture, &c.—The lower part of the valley of the Tees, and the coast from the mouth of the Tees to Hartlepool, are occupied by the new red sandstone. The conglomerate limestone crops out from beneath the north-western limit of the red sandstone. This limestone forms a range of round-topped hills along the coast, of small elevation. The upper stratum of the limestone is a species of breccia, with which wide chasms or interruptions in the cliff are filled: the next strata are thin and slaty, of a white colour inclining to buff; but lower down the stratification becomes indistinct, the rock is of a crystalline and cellular texture, and of a light-brown colour. The brown variety is quarried near Sunderland. A description of the coal-deposit is given under COAL-FIELDS. The coal-field of Durham is intersected by many remarkable dykes of basalt and greenstone. The coal-field is bounded on the west by millstone-grit, the beds of which are estimated to be 900 feet thick: they comprise, besides the grit, many strata of shale and sandstone. Much of the grit is employed for making millstones. Westward of the district just named occurs the carboniferous or mountain limestone, interstratified with siliceous grit and slate-clay: many of these layers are valuable for building and for cement. This group is the great depository of the lead veins of the north. The lead ore is chiefly galena, which is found in the veins.

A great part of the county lay at one time in open commons and common fields, most of which are now divided and inclosed. The moors and heaths that remain are chiefly in the poor district westward, and even there cultivation has spread very generally; and the wastes are profitable, in some degree, by rearing a hardy breed of sheep and cattle. The general state of cultivation throughout the county is above mediocrity. Fallows are found indispensable on the cold wet clays; but wherever turnips can be raised this useful root supersedes the old summer fallow. The rotation usually adopted on the better soils includes two or three years of grass, and begins invariably with turnips. The convertible husbandry is very generally adopted by the best farmers, and found most profitable in the end. The farms are not, in general, very large. The implements of husbandry have nothing peculiar in them. Horses are almost exclusively used for agricultural purposes; and an ox-team is a rarity. Thrashing-mills are common.

There are many rich upland meadows and permanent pastures, where cattle and horses are bred to great advantage, and where oxen and sheep are fattened by grazing; but there are very few water-meadows, although there are many situations where they might very easily be established. The quan-

tity of hay on the upland meadows is on an average 1½ ton per acre. The best meadows are mown every year, and manured every third or fourth year. When grass land is ploughed up and converted into arable, the practice of paring and burning the surface is very generally adopted. This county is not remarkable for its gardens or orchards. There are some good oak-woods, and many new plantations, where the tenure is freehold.

The cattle bred in the county are in great repute, and a great number are annually purchased at the different fairs in this county, and driven northward and southward. The Teeswater or Holderness breed is the finest of the short-horns. The cows are remarkable for the quantity of milk which they give, as well as their aptitude to fatten. The oxen are considered as the most profitable breed for stall feeding, as they become fit for the butcher at an earlier age than most other breeds. The milkmen near London and other large towns scarcely ever have any but Durham cows. The horses bred in this county are of a superior description, both for draught and for the saddle. There was once a very large breed of sheep in the south-eastern part of the county, which bore heavy fleeces, and when killed often weighed from 50 lbs. to 60 lbs. the quarter. But the improved Leicester breed has nearly superseded them, as being more profitable, and fattening at an earlier age.

Divisions, Towns, &c.—The county of Durham is a county palatine, *i. e.*, a county within which some lord had a jurisdiction 'as fully as the king had in his palace;' but an Act of Parliament having some years since transferred the palatinate jurisdiction from the bishop of Durham, by whom it had long been held, to the crown, the distinction has been for most practical purposes abolished. The county of Durham is divided into 4 wards, Chester Ward, Darlington Ward, Easington Ward, and Stockton Ward, and has 4 outlying districts. Islandshire, Norhamshire, and the parish of Bedlington, which are locally in Northumberland, and the parish of Craike, which is in Yorkshire. The county is in the bishopric of Durham, and archbishopric of York. It constitutes an archdeaconry, except the three outlying portions, which are in the archdeaconry of Northumberland. The number of parishes is about 60, to which are to be added 15 parochial chapelries. The county of Durham is included in the Northern Circuit, and the assizes are held in the city of Durham. For parliamentary purposes it is divided into North Durham and South Durham, each of which returns 2 members to parliament, in addition to which 2 members are returned for the city of Durham, 2 for the borough of Sunderland, 1 for Gateshead, and 1 for South Shields.

The following are the principal towns, with the population of each in 1841:—

Barnard-Castle is situated on the north-eastern bank of the Tees, on an acclivity which rises rapidly from the river, 23 miles S.W. from Durham. The town has its name from a large castle, the remains of which extend over upwards of six acres. Portions of the walls exist, and a large circular tower which stands on a perpendicular cliff 100 feet above the river. The town has several narrow streets, and one very wide. The church, or rather chapel-of-ease, is an ancient structure, with a detached bell-tower. Population of the chapelry, 4452.

Bishop-Auckland is situated on the south bank of the river Wear, 10 miles S.W. from Durham. The small river Gaunless flows past the eastern side of the town into the Wear. The town is well-built and has a spacious market-place. There is an endowed grammar-school, and another endowed school. The bishop of Durham has a palace here, to which is annexed a beautiful gothic chapel, the whole occupying the site of a former magnificent palace belonging to the bishops of Durham. The Gaunless flows through the bishop's park. Population of the township, 3776.

Chester-le-Street is on the high north road between Durham and Newcastle-upon-Tyne, 6 miles from Durham, and 8¼ miles from Newcastle. This town became, A.D. 882, the seat of the bishopric, which was removed hither from Lindisfarne, and it retained its episcopal rank until 995, when a Danish invasion drove away the bishop and his clergy, who afterwards settled at Durham. The church, after losing its rank as a cathedral, became first rectorial, afterwards collegiate: the manor has been constantly vested in the see of Durham. The village extends nearly a mile along the north road; another more irregular line of houses runs along the Cone, a brook which flows past it at right angles to the main street. The church has a tower at the west end surmounted with a lofty spire. Population of the township, 2599.

Darlington is situated on the west bank of the Skerne, about 18 miles S. from Durham. The town, which stands on the eastern slope of a hill, at the foot of which the river flows, consists of a square market-place, of which the church forms the eastern side, and several streets branching from it. A bridge of three arches over the Skerne communicates with Yorkshire by the Yarm and Stockton roads. The church has a central tower surmounted by a light spire. It is very ancient except the east end of the chancel and the spire, which are modern. There are places of worship for several classes of dissenters. The trade of Darlington is considerable. The chief occupation of the inhabitants is combing wool and making woollen yarn (which is applicable for imitation India shawls, Brussels carpets, &c.), spinning flax, grinding optical glasses, and founding iron. The town has a well-endowed grammar-school, founded by Queen Elizabeth, and several other schools. The York and Newcastle Railway passes by Darlington, whence there are branches to Stockton, Bishop-Auckland, and Wolsingham. Population of the township, 11,008.

Durham is the capital of the county. [DURHAM.]

Gateshead, a municipal borough and parliamentary borough, is situated on the south bank of the river Tyne, opposite to Newcastle, with which it communicates by a handsome stone bridge. There are two principal streets, one of which descending towards the bridge, is exceedingly steep. The church is ancient and spacious,

and has a lofty tower. The town is annually increasing in manufacturing and commercial importance. There are coal mines within the limits of the borough, which are extensively worked, and employ a large proportion of the inhabitants. The chief manufactures are of glass and iron. There are places of worship for dissenters, a free grammar-school, and several other schools. The municipal borough is divided into 3 wards, and governed by 6 aldermen and 18 councillors. Population of the parishes of Gateshead with Gateshead-Fell, 19,505. The parliamentary borough returns one member to the House of Commons, and has a population of 19,843. The Sunderland, South Shields, Durham, and Wear Valley railways communicate *through* Gateshead with the Newcastle and Carlisle Railway, and Newcastle and Edinburgh Railway.

Hartlepool is built on a small peninsula jutting out into the sea, a few miles from the mouth of the Tees. The peninsula is partly formed by a pool, dry at low water, into which flows a small brook. The peninsula forms one of the most marked features of the eastern coast; the town, now much decayed, is on its S.W. side. There appears to have been a monastery early founded here, of which St. Hilda was abbess: it is mentioned by Bede. King John, by charter A.D. 1200, erected Hartlepool into a borough. In the course of the thirteenth century the walls were erected, and a small haven of nearly twelve acres formed. The walls inclosed and defended the town and haven on every side, except where the abrupt cliffs on the eastern side of the peninsula rendered defence needless: a considerable part of these walls still remain. The old haven is now quite disused. The present harbour is formed by a pier run out on the south side of the town: it is the only safe harbour between Sunderland and Bridlington, easily accessible in every wind to light vessels or to laden vessels under 100 tons, which ride secure from the storms most frequent and destructive on the eastern coast, and in moderate weather they can sail out with all winds. The town rises from the edge of the old haven towards the town moor, and consists of one principal and several smaller streets. Wet docks have been recently formed under the provisions of a local act, and many new houses have been built. There is a town-hall, erected about the middle of the last century. The inhabitants are chiefly engaged in fishing. Hartlepool is a place of some resort for sea-bathing. The church is on an elevated site at the south-east end of the town. It is a large and curious building, chiefly in the early English style. Population of the parish, 5236.

Sedgefield is on the road from Stockton to Durham, 9 miles S.S.E. from Durham, and 9 miles N.N.W. from Stockton. Sedgefield is a small neat town, situated on an eminence which commands an extensive prospect over the vale of Tees and Yorkshire hills beyond. The church is one of the handsomest in this part of the county: the date and style of the architecture are different in different parts. Population of the township, 1345.

South Shields, a parliamentary borough and seaport, is situated on the south side of the Tyne, at its mouth. The town, which has risen into importance with the extension of the coal-trade in modern times, consists of a long and narrow street running parallel to the river, and this is the old part of the town, but the modern part is better and more conveniently built. The Town-Hall, near the centre of the town, has a market-house beneath it. There is an ancient chapel and a modern chapel of ease. There are several dry docks, and the building and repairing of ships is carried on with activity. The chief manufactures are of glass, earthenware, soda, alum, and ale. Coals are brought down the river in keels, and *shipped* at South *Shields*, and there are also coal-mines in the vicinity. Population of the township, 9082. The borough returns one member to parliament, and consists of the township of South Shields and chapelry of Westoe, the population being 23,072. The parish of Jarrow, once celebrated for its monastery, in which the venerable Bede was educated, contains, besides South Shields and Westoe, the chapelry of Heworth, with a population of 7008; the township of Jarrow, with a population of 3250; and the small townships of Harton, Hedworth, and Monkton. South Shields has communication by railway with Durham and Newcastle.

Staindrop is about 19 miles S.S.E. from Durham. It is an ancient town situated in a beautiful vale. Many of the houses are well built, and chiefly form one wide street ranging east and west. Staindrop Beck runs at the east end of the town. The church is an ancient fabric, consisting of a nave, aisles, chancel, and an embattled tower at the west end. Close to Staindrop is Raby Castle, a structure of great extent and grandeur, with its park, which is very extensive.

Stanhope is situated on the *north* bank of the Wear, and has a population of 1827, who are chiefly engaged in the lead mines. The church is a plain and ancient building.

Stockton, or *Stockton-upon-Tees*, a municipal borough and port, is situated on the northern bank of the Tees. The principal street is wide, and is nearly a mile long, and the other streets are either parallel or at right angles to it. It is a very handsome town. The church is spacious, and there are several places of worship for dissenters. The town-hall has a clock-tower and spire, and there is a custom-house, a news-room, an assembly-room, a small theatre, a mechanics' institution, and a dispensary. The municipal borough is divided into 2 wards, and is governed by 6 aldermen and 18 councillors. Population, 9825. The number of sailing-vessels registered Jan. 1, 1848, was 151 (24,322 tons); steam-vessels, 27 (572 tons). A stone bridge of five arches crosses the Tees, and the town has railway communication with Darlington and Redcar.

Sunderland. [SUNDERLAND.]

Wearmouth. [SUNDERLAND.]

Wolsingham is pleasantly situated on the north side of the Wear, on a point of land formed at the confluence of the Westrow and the Wear. The market is chiefly for the supply of the lead-mine

district, which commences between this town and Stanhope. The district is easily recognised by the blue unwholesome vapours which arise from the smelting-houses.

History and Antiquities.—At the time of the Roman invasion the main part of the county of Durham was included in the territory of the Brigantes. The Romans had several stations in the county, of which two are supposed to have been at Ebchester, on the Derwent, and Binchester, near Bishop-Auckland. Roman antiquities have been met with in every part of the county.

In the establishment of the Saxon Octarchy, Durham was probably included in the kingdom of Deira, the southernmost of the two which are frequently comprehended under the general name of Northumberland. When Oswald, who united the two kingdoms under one sceptre, wished to introduce or rather revive Christianity, Aidan, a monk of Iona or elsewhere in Scotland, who had come as a missionary (A.D. 634), fixed his residence at Lindisfarne, or Holy Island, and established a monastery and a bishopric there. The bishopric was afterwards removed successively to Hexham, Chester-le-Street, Ripon, and Durham. The ruins of the conventual church still remain: the north and south walls, and great part of the west wall, are still standing: the east wall has fallen in. It has been a very magnificent building, in the Norman style.

When William of Normandy attacked Durham, a defeat which one of his generals suffered led him to take a most dreadful revenge. For sixty miles between York and Durham he did not leave a house standing, reducing the whole district by fire and sword. He did not even spare the churches and monasteries. A famine ensued, and a mortality not equalled in the annals of the country: the inhabitants were reduced to eat the flesh of horses, dogs, cats, and vermin. The lands lay untilled for nine years, infested by beasts of prey; and the poor remnant of the inhabitants spared from the sword died in the fields, overwhelmed with want and misery. The Normans on many subsequent occasions treated the county of Durham with great severity; and in the many incursions of the Scots between the 11th and 14th centuries, Durham, from its vicinity to the border came in for a full share of disaster.

Durham does not appear to have been the scene of any remarkable event in the war of the Roses. At the time of the Reformation, the inhabitants showed a leaning towards Catholicism, which exposed them to much persecution except when Mary was on the throne. During the civil war of Charles I. Durham took but a subordinate part in the king's favour.

DURHAM, a city, municipal borough, parliamentary borough, and the capital of the county of Durham, is 67 miles E.S.E. from Carlisle, 67 N. by W. from York, and 259 W.N.W. from London.

We have no evidence of any town having existed where Durham now stands before the end of the tenth century, when the monks of Lindisfarne, or Holy Island, rested there with the remains of St. Cuthbert. A church was built on the site by Bishop Aldun, and dedicated to St. Cuthbert, whose remains were enshrined in it. The town of Dunholme, or Durham, was built around the church, and was soon afterwards well fortified. In 1072 a strong castle was built here, and Walcher, a Norman, was appointed to the bishopric. This prelate purchased the earldom of Northumberland, and assumed the title of Count Palatine. In 1093 the old church built by Aldun was pulled down, and the present magnificent edifice begun by King Malcolm, Carilepho the bishop, and Turgot the prior.

By the 6th and 7th Will. IV., chap. 19, the palatine jurisdiction of the bishops of Durham is taken away, and is vested in the crown as a separate franchise and royalty. Before the passing of that act, the bishop of Durham, as count palatine and earl of Sedberg, was custos rotulorum of the county; he presided at the assizes, with his Majesty's judges, and the sheriff was accountable to him, and not to the king.

The city is situated on the northern bank of the Wear, which, sweeping round, forms a peninsula, on which the city is built, and the centre of which rises to a lofty eminence, partially inclosed by the ancient walls, and skirted with hanging gardens descending to the river, on each side of which are delightful public walks called 'The Banks.' The river is crossed by two ancient bridges and one modern bridge.

The cathedral and the castle crown the summit of the rocky peninsula on which the city is built. The cathedral was begun during the reign of William Rufus by Bishop William de Carilepho, and was continued, if not quite finished, by his successor Ranulf Flambard. The cathedral erected by these prelates was of the form of a long cross, with two turrets at the west end, and between them a large and richly ornamented arched door of entrance.

The first addition to the original church was the Galilee, or Western Chapel, built between 1153 and 1195. The nave was vaulted by Prior Thomas Melsonby, who acceded in 1233, to whom also some ascribe the projecting of the great central tower and the beginning of the building of the Chapel of the Nine Altars. These great works were finished by Richard Hotoun, who became prior in 1290, and who is recorded to have vaulted the choir. The great west window was inserted by prior John Fossour about the year 1350. The successive additions to this cathedral have rendered the church, as it now stands, not only a perfect specimen of the Norman architecture, but an instructive series of examples illustrative of the gradual changes of the English style to the beginning of the 15th century. The extreme length of the cathedral is 507 feet; extreme breadth, 194 feet; height of the nave, 70 feet; height of the central tower, 210 feet. A plan of Durham Cathedral is given in the 'Penny Cyclopædia,' in the article 'Church.'

The castle, which forms the occasional residence of the bishops of Durham, is supposed to have been built by William the Conqueror. The north gateway was used as a county gaol. In the market-place is the guildhall, erected by Bishop Tunstall in 1555 and on the Palace

Green is the exchequer. The town is lighted with gas, and well paved. A public fountain stands in the centre of the market-place, to which the water is conveyed through pipes from a spring about half a mile distant. There is a theatre, as well as a subscription library, news-room, and assembly-rooms. There are iron and brass foundries, and manufactories of stuffs and carpets, for spinning and combing wool, and for making hats.

The city comprises six parishes, each having its church, and there are places of worship for various classes of dissenters. There is a grammar-school connected with the cathedral, with 18 boys on the foundation, and at which about 60 other boys are educated. There are several other schools and some charities.

Durham University.—In 1831 an Act was passed 'to enable the Dean and Chapter of Durham to appropriate part of the property of their church to the establishment of a University in connection therewith, for the advancement of learning.' By this act the government of the University was vested in the dean and chapter, subject to the jurisdiction of the bishop of Durham for the time being as visitor, and the establishment was to consist of a warden or principal, of certain professors and readers, tutors, students, and other officers and persons. In 1847 the university had Professors of Divinity and Ecclesiastical History, of Greek and Classical Literature, and of Mathematics and Astronomy. It had also Readers of Hebrew, of Law, of History and Polite Literature, of Natural Philosophy, and of Chemistry. The management of the University is committed by charter to the warden, a senate, and convocation. Twenty-five fellowships have been founded, some tenable by laymen. The students are lodged in the castle and other adjacent buildings. The University College has a master and vice-master, a bursar, and 2 chaplains, and Bishop Hatfield's Hall has a principal and chaplain.

The municipal borough is divided into 3 wards, and is governed by 6 aldermen and 18 councillors. Population, 14,151. The parliamentary borough returns 2 members to the House of Commons. Population, 9577.

The bishopric of Durham includes Durham, Northumberland, and Hexhamshire, and the bishop's income is fixed at 8,000*l.* per annum.

DURHAM UNIVERSITY. [DURHAM, City.]

DURHAM, JOHN GEORGE LAMBTON, EARL OF, was born at Lambton Castle, Durham, on April 12, 1792. The family is said to have possessed its manor of Lambton ever since the 12th century, the male succession never having been interrupted since that remote date. He was educated at Eton, and on Jan. 1, 1812, he was married at Gretna Green to Miss Harriet Cholmondeley. By Miss Cholmondeley, who died July 11, 1815, he had three daughters, who all died before himself, though not till after they had all attained the age of womanhood. On December 9, 1816, he married the Lady Louisa Elizabeth Grey, eldest daughter of Earl Grey.

On August 1, 1813, Mr. Lambton had been returned to parliament for his native county. He very soon took a part in the proceedings of the House, his maiden speech having been delivered on May 12, 1814. He continued to sit for the county of Durham so long as he remained a commoner, and, though he did not speak often, he made a considerable figure in the debates. On April 17, 1821, he submitted to the House a plan of parliamentary reform, which was rejected. His exertions in the House of Commons now began to relax under the pressure of ill health; and his name is scarcely connected with any measure of consequence down to the great and eventually successful renewal of the Reform agitation in 1830. With the generality of his party, he supported both the Canning ministry of May 1827, and that of Lord Goderich, by which it was succeeded in October of the same year; and on the dissolution of the latter, in January, 1828, he was raised to the peerage with the title of Baron Durham of the City of Durham.

On the formation of the ministry of Lord Grey, in November, 1830, Lord Durham was made Lord Privy Seal; and the preparation of the government Reform Bill was intrusted to four persons, of whom he was one, the others being Lord John Russell, Sir James Graham, and Lord Duncannon. A speech which Lord Durham delivered on March 28, 1831, in the House of Lords, in explanation of the measure, was published. He took no part in the discussion of the second Reform Bill in the House of Lords, where it was defeated on the second reading on October 3. He spoke several times however in support of the third and last bill, which was discussed in the Lords in April and May, 1832, and especially made a very able speech in committee on the 22nd of May, 'on the enfranchisement of the metropolitan districts,' which was published. On March 12 in the latter year he resigned his office in the government, and three days after was made Earl of Durham.

In the summer of 1833 Lord Durham was dispatched on a special mission to Russia in favour of the Poles, but it was not attended with any success. From the time of his return to England, after a few months' absence, he more distinctly joined the section of the liberal party which advocated still further reforms in the representation. In 1835 he was sent out a second time to Russia, as ambassador at the court of St. Petersburg; and he retained that post till the summer of 1837.

Lord Durham's last political undertaking was perhaps his most important—the pacification of the troubles and dissensions of Canada, to which country he was sent out as High Commissioner and Governor-General, with extraordinary powers, in 1838. He arrived at Quebec on the 27th of May; but a misunderstanding or difference of views soon arose between him and the ministry at home; and, conceiving that he was not supported as he ought to be, without having been either recalled or having obtained leave to return, he re-embarked from the same port on the 1st of November following. His arrival in London on the 7th of December was speedily followed by the publication of a report addressed to the Queen, dated 'London, January 31, 1839,' of great

ability and interest, detailing the history of his colonial administration, vindicating his conduct, and explaining the principles on which he had proceeded, and on which he conceived that the management of the affairs of Canada ought to be conducted.

The state of his health now no longer permitted him to take any part in public affairs, at least beyond attending occasionally in the House of Lords. At last, early in the summer of 1840, he retired, with no hope of recovery, to the Isle of Wight; and he died at Cowes, on the 28th of July. A son, the present earl, and three daughters, one of whom is since dead, survived him.

DU'RIO, a genus of which the name has been derived from *durion* or *doorean*, a well-known fruit of the Malayan Archipelago. It belongs to the natural family of *Bombaceæ*.

Durio zibethinus is a large and lofty tree, with alternate leaves, which are small in proportion to its size; in form they resemble those of the cherry.

The Durion is a favourite food of the natives during the time (May and June) when it is in season; but there is usually also a second crop in November. It is as remarkable for the delicacy combined with richness of its flavour, as for the intolerable offensiveness of its odour, which is compared by Rumph to that of onions in a state of putrefaction, on which account it is seldom relished by strangers, though highly esteemed by many European residents.

The seed, with its edible enveloping pulp, is about the size of a hen's egg; the latter is as white as milk, and as delicate in taste as the finest cream, and should be eaten fresh, as it soon becomes discoloured, and undergoes decomposition.

The seeds of the Durion are likewise eaten when roasted, and have something of the flavour of chestnuts. The wood of the tree is valued for many economical purposes. The rind of the fruit is likewise turned to account by the industrious Chinese, as its ashes, when burnt, probably from containing potash, are used by them in the preparation of some dyes.

DURLACH, a town in the Grand Duchy of Baden, situated on the Pfinz, at the foot of the Thurmberg, a richly cultivated hill, about 4 miles S.E. of Carlsruhe, the road to which is formed by a straight avenue of Lombardy poplars. It is in 48° 59′ N. lat., 8° 25′ E. long., and has 4400 inhabitants. The town is old, and was long the residence of the margraves of Baden-Durlach. The palace, called the Carlsburg, and its grounds, in which are some Roman altars and milestones, are the chief attraction to the place.

DÜRRENBURG. [Mersburg; Saltzburg.]

DURSLEY. [Gloucestershire.]

DURTAL. [Maine-et-Loire.]

DUSSEK, JOHANN LUDWIG, a celebrated composer for and performer on the piano-forte, was born in Bohemia, in 1760. Dussek came to London about the year 1790, and immediately distinguished himself. In 1800 he quitted England, and two years afterwards became part of the household, and also the confidential friend of Prince Louis Ferdinand of Prussia, who died at Saalfield in 1806. He then entered into the service of Prince Talleyrand, in which he continued till his death in 1812.

DÜSSELDORF, a government in the Prussian Rhein-Provinz, is bounded N. by Holland, E. by Westphalia, S. by the government of Cologne, and W. by Holland. It has an area of 2065 square miles, and had in 1843 a population of 851,456. It is the most densely peopled portion of the Prussian dominions. About four-sevenths of the inhabitants are Roman Catholics, and the rest Protestants. The Rhine, which enters this government near Rheinfeld, divides it into two nearly equal portions, and, after receiving several small rivers, quits it near Schenkenschanz, where it is 2300 feet in width. Its principal feeders on the left bank are the Erft and Mörs, and on the right bank the Wipper, Düssel, Ruhr, Emsche, and Lippe. The northern part of the government is level, and though it contains large tracts of sand, it has also a considerable extent of good arable land and pastures: The soil of the other parts is highly productive in general, but there are many forests and barren tracts in the mountainous districts, on the right bank of the Rhine. There are extensive manufactures of woollens, silks, cotton, thread, leather, steel, iron, ironware and cutlery, tobacco, soap, &c. Iron, coals, and potters' clay, are among the native products. Grazing and the rearing of horses and cattle are actively pursued. The government is crossed by railroads which communicate with the Belgian, Hanoverian, and Prussian lines. The chief towns are Barmen, Cleves, Crefeld, Düsseldorf, and Elberfeld. [Rhein-Provinz.]

Among the other towns are—*Duisburg*, which stands on the left bank of the Ruhr, near its junction with the Rhine, 15 miles N. by railroad from Düsseldorf; it is a free port, and has five churches, a gymnasium, a large vitriol factory, steam cloth mills, slips for building steam and sailing vessels, and several other industrial establishments: population, 7000: *Essen*, which stands E. of Duisburg, between the Ruhr and the Emsche, in a rich iron and coal district, has four churches, a gymnasium, an hospital, iron blast furnaces, cast-steel works, smalt factories, &c., and a population of about 6000: *Emmerich*, a frontier fortress of Prussia, which stands on the right bank of the Rhine, and has 5600 inhabitants; it stands in the centre of a rich agricultural district, has four churches, a custom-house, considerable manufactures of woollens, soap, leather, hats, &c.: *Lennep*, not far from the left bank of the Wipper, which has important cloth factories, and dye-houses, and trades in wines, hats, iron ware, &c.; population, 4500: *Mühlheim*, a pretty town on the right bank of the Ruhr, which has large silk and cotton factories, zinc and iron works, establishments for the manufacture of steam machinery, and 6500 inhabitants: who are also largely engaged in the export of coals: *Neuss*, a fortress and flourishing manufacturing town, 4 miles S.W. of Düsseldorf, which has 8000 inhabitants; it is said to be the *Novesium* of the Romans; up to the 13th century the Rhine flowed close past the walls, from which it is now nearly 2 miles distant; the church of St. Quirinus is the most important building; the manufactures

are woollen cloth, flannel, cotton cloth and yarn, ribands, hats, starch, vinegar, soap, oil, &c.; there is also a good trade in corn, slates, timber, coals, quills, and stone: *Ronsdorf*, 4 miles N.W. from Lennep, has 6000 inhabitants, who manufacture cutlery, silk, cotton cloth, woollen cloth, and linen: *Ruhrort*, at the entrance of the Ruhr into the Rhine, which has a large trade in coals, yards for building steam-tugs, workshops for the construction of steam and other machinery, and about 2000 inhabitants: *Solingen*, 15 miles S.E. from Düsseldorf, which has 4000 inhabitants, and is famous for the manufacture of sword-blades, foils, cutlery, and iron ware: and *Wesel*, which stands at the junction of the Lippe with the Rhine, and on the right bank of the latter; is a fortress of the first class, defended by a citadel on the south side of the town, and connected by a bridge of boats with Fort Blücher, on the left bank of the Rhine; the town, including the garrison, has 13,000 inhabitants, who manufacture woollen and cotton cloths, soap, hats, cordage, leather, beer, &c., and carry on a considerable trade with Holland by the Rhine, and with Westphalia by the Lippe, which has been made navigable; the chief articles of commerce are corn, timber, coals, salt, wine, brandy, and colonial produce; it has a gymnasium, 7 churches, a synagogue, a handsome rath-haus (town-house), an arsenal, house of correction, and a great number of distilleries.

DÜSSELDORF, the capital formerly of the duchy of Berg, now of the government of Düsseldorf, is situated at the junction of the Düssel with the Rhine, on the right bank of the latter, in 50° 13′ N. lat., 6° 46′ E. long., 22 miles by railway N. from Cologne, and has a population of 26,134. It is one of the best-built towns on the Rhine, is surrounded by extensive garden grounds, and consists of three quarters; namely, the Alstadt, on the right bank of the Düssel, the Carlstadt and the Neustadt, which are the finest quarters. The streets are broad, planted with avenues of trees, and contain many showy shops. There are five squares or open spaces, on one of which stands a bronze equestrian statue of Johann Wilhelm, elector-palatine, the remains of whose palace forms the most remarkable structure in the town. The town had formerly a famous picture gallery, founded in 1710; but the paintings were removed to Munich in 1808, and those it now contains are said to be of little value. It is the seat of a school of painting, which has thriven well, and has conferred great benefits upon the manufacturing population of the district. An exhibition of paintings is held every summer. The other buildings of consequence are—the present palace, where the governor resides; the observatory, town-hall, courts of law, new barracks, theatre, gymnasium, a mint, and public library of about 30,000 volumes. Düsseldorf has seven churches, including two Protestant; the most remarkable are St. Lambert's and St. Andrew's, which contain some good pictures, and the tombs of several of the dukes of Berg. There are also a synagogue, several schools, a house of correction, and a lying-in institution in the town.

Düsseldorf is the seat of the provincial government and tribunals of justice. A court of assize has been held in the town for several years, at which trial by jury is allowed in criminal cases. It has manufactories of woollens, cottons, leather, hats, tobacco, jewellery, mirrors, stockings, &c., and carries on a considerable trade in cotton, wool, wines and spirits, colonial produce, coals, timber, slates and other commodities. It has been a free port since 1829. The growing importance of Düsseldorf as a commercial port is seen from the following table of the quantity of merchandise imported and exported in the years stated:—

	Imported. Cwts.	Exported. Cwts.
1836 ...	855,533	113,144
1840 ...	1,160,952	135,825
1843 ...	1,332,465	219,647
1844 ...	1,311,310	193,773
1845 ...	1,535,926	206,370

Steamers ply regularly up and down the Rhine. (Hassel, *Handbuch;* Banfield, *Industry of the Rhine;* Murray, *Handbook for N. Germany.*)

DUTCH AUCTION. [AUCTION.]

DUTCH METAL. [BRASS.]

DUTE'NS, LOUIS, was born at Tours, of a Protestant family, in 1730. After receiving his education in France, he came to England, and travelled with several noblemen in succession over the continent, and also acted for a time as secretary to the English minister at the court of Turin. On his return to England he was presented to the living of Elsdon in Northumberland. He was made member of the Royal Society of London, and of the Académie des Inscriptions et Belles Lettres of Paris. Being well versed in ancient and modern philology, and in archæology and numismatics, he wrote many works on those subjects. Dutens died in England in 1812.

DUU'MVIRI, the name given to any magistrates in the republic of Rome who were elected in pairs for the discharge of any class of duties.

DWARF is a technical term employed by gardeners to distinguish fruit trees whose branches proceed from close to the ground from *riders* or standards whose original stocks are several feet in height.

DWARFING TREES. There are various methods of producing this effect; such as selecting peculiar kinds of stocks and grafting upon them. For example, if the pear-tree be grafted upon the quince stock, or the peach upon the plum, their growth is very much retarded, and their ultimate size is comparatively small: the same effect is produced upon all other trees where there is a difference between the tissue of the stock and that of the scion which has been grafted upon it; or if dwarf varieties be grafted upon stocks of a similar constitution, though taller in growth, the former will still retain their original character. Again, if the branches be bent, and the flow of the sap in any way impeded, or if a quantity of the fibrous roots be cut away, and nourishment more sparingly supplied to the branches, we arrive at the same results. Sometimes trees are dwarfed by very severe pruning. This method is very common among the Chinese.

There is another method of producing dwarf trees, which may be termed accidental; namely, selecting dwarf individuals and obtaining seed from them; and, if this is done repeatedly through successive generations of trees, a variety may be obtained of a very small size. This is the origin of dwarf roses, sweet williams, dahlias, and other common cultivated flowers.

DWIGHT, TIMOTHY, an eminent American Presbyterian divine, was born at Northampton, in Massachusetts, May 14, 1752. At the age of seventeen, very soon after taking the degree of B.A. at Yale College, Newhaven, he was appointed master of a grammar-school in that town, and, before he was twenty, one of the tutors of Yale College. He was licensed to preach in 1777, in which year, the sessions of the college having been stopped by the war of the Revolution, he offered his services as a chaplain in the American army. The death of his father in the following year rendered it desirable that he should return to Northampton, and the rest of his life was principally occupied in discharging the duties of tuition, first as master of a private seminary, next as president of Yale College, to which office he was appointed in 1795. He also held the professorship of theology. He died January 11, 1817.

Dr. Dwight published in 1823 his 'Travels in New England and New York,' 4 vols. 8vo., 1823, which contain a great quantity of information, statistical, topographical, and historical. The historical parts, especially those relating to the Indian history, manners, and warfare, are of much interest. Dr. Dwight's chief work however is 'Theology explained and defended in a Series of Sermons,' 5 vols. 8vo. It is a course of 173 lectures, delivered by him as professor of divinity on the Sundays in term-time, so as to occupy about four years.

Two more volumes of his sermons, 59 in number, were published in 1827. Dr. Dwight is said to have been a very useful and effective as well as a learned preacher.

DWINA, the largest river that falls into the White Sea, originates in the confluence of two smaller rivers, the Sukhona and Yug, in 60° 46′ N. lat., 46° 30′ E. long. The Sukhona, a navigable stream, which flows out of Lake Koubinskoe, and runs through the south-west of the Russian government of Vologda, describes a course of about 285 miles between that lake and its junction with the Yug. The Yug, flowing down from a morass on the northern slope of the Vologda mountains, and in the upper part of its course washing the walls of Nikolsk, has a length of about 248 miles. These two rivers unite below the town of Veliki-Usstiug and form the Dwina. From this point the Dwina flows in a general north-westerly direction through the governments of Vologda and Archangel, and discharges its waters, through five arms below the town of Archangel, into the bay of Dwinskaya, in the White Sea. Its length is about 700 miles. It is navigable, from the close of April to the first week in November, for a distance of about 240 miles. It generally flows between high banks, and is on an average from 500 to 600 feet in width; at Archangel this width is increased to four miles. Soon after it has received the Pinega on its right bank, it forms a number of islands, which extend to its mouth. Its chief navigable tributaries on the right are the Vitshegda, which falls into the Dwina near Kershensko, in Vologda, from which point the Dwina becomes navigable; and the Pinega, which enters the Dwina, in the government of Archangel, a little above the town of Kholmogory. By a canal which joins the Keltma, a feeder of the Vitshegda, with the Kuma, a large tributary of the Volga, the communication between the White Sea and the Caspian is completed. On its left bank the Dwina receives the Vaga and the Yamza, or Emtsa. The tides of the Dwina are perceptible nearly 30 miles above Archangel. The basin of the river occupies an area of about 123,900 square miles. Its waters abound in fish.

DYEING is the art of staining textile substances with permanent colours. It was an art known and practised to a considerable extent by the ancient Egyptians, Phœnicians, Greeks, and Romans. The moderns have obtained from the New World several dye-drugs unknown to the ancients; such as cochineal, quercitron, Brazil wood, logwood, arnotto; and they have discovered the art of using indigo as a dye, which the Romans knew only as a pigment. But the vast superiority of our dyes over those of former times must be ascribed principally to the employment of pure alum and solution of tin as mordants, either alone or mixed with other bases; substances which give to our common dye-stuffs remarkable depth, durability, and lustre. Another improvement in dyeing of more recent date is the application to textile substances of metallic compounds, such as Prussian blue, chrome yellow, manganese brown, &c.

Bergman appears to have been the first who referred to chemical affinities the phenomena of dyeing. Having plunged wool and silk into two separate vessels, containing solution of indigo in sulphuric acid diluted with a great deal of water, he observed that the wool abstracted much of the colouring matter, and took a deep blue tint, but that the silk was hardly changed. He ascribed this difference to the greater affinity subsisting between the particles of sulphate of indigo and wool, than between these and silk; and he showed that the affinity of the wool is sufficiently energetic to render the solution colourless by attraction the whole of the indigo, while that of the silk can separate only a little of it. He thence concluded that dyes owed both their permanence and their depth to the intensity of that attractive force. We have therefore to consider in dyeing the play of affinities between the liquid medium in which the dye is dissolved and the fibrous substance to be dyed. By studying these differences of affinity, and by varying the preparations and processes, with the same or different dye-stuffs, we may obtain an indefinite variety of colours of variable solidity and depth of shade.

Dye-stuffs, whether of vegetable or animal origin, though susceptible of solution in water,

and, in this state, of penetrating the pores of fibrous bodies, seldom possess alone the power of fixing their particles so durably as to be capable of resisting the action of water, light, and air. For this purpose they require to be aided by another class of bodies, *mordants*, which bodies may not possess any colour in themselves, but serve in this case merely as a bond of union between the dye and the substance to be dyed. Mordants may be regarded in general as not only fixing but also occasionally modifying the dye, by forming with the colouring particles an insoluble compound, which is deposited within the textile fibres. Such dyes as are capable of passing from the soluble into the insoluble state, and of thus becoming permanent, without the addition of a mordant, have been called substantive, and all the others have been called adjective colours. The first principle of dyeing fast colours consists in causing the colouring matter to undergo such a change, when deposited upon the wool or other stuffs, as to become insoluble in the liquor of the dye-bath. The more powerfully it resists the action of other external agents, the more solid or durable is the dye.

In the following details concerning the art of dyeing we shall consider principally its application to wool and silk, having already treated, in the article COTTON OR CALICO PRINTING, of what is peculiar to cotton and linen.

The operations to which wool and silk are subjected preparatory to being dyed are intended, 1, to separate certain foreign matters from the animal fibre; 2, to render it more apt to unite with such colouring particles as the dyer wishes to fix upon it, and also to take therefrom a more lively and agreeable tint, as well as to be less liable to soil in use. The matters foreign to the fibre are either such as are naturally associated with it during its production by the animal, such as have been added to it in the spinning and weaving operations, or such as have been accidentally applied.

Silk is scoured by means of boiling in soap and water, whereby it is freed from a sort of varnish: if intended to be very white, it is bleached by humid sulphurous acid. Wool is first washed in running water to separate its coarser impurities; it is then deprived of its *yolk* (a species of animal soap secreted from the skin of the sheep) either by the action of ammoniacal urine, by soap and water, or by a weak lye of carbonate of soda. It receives its final bleaching by the fumes of burning sulphur, or by aqueous sulphurous acid. Wools present remarkable differences in their aptitude of combining with dye-stuffs, which depend upon the different structure of the imbrications of the filaments. The wool is often subjected to preparatory processes to increase its power (when deficient) of imbibing colour.

Tinctorial colours are either simple or compound. The simple are black, brown, or dun; blue, yellow, and red; the compound are gray, purple, green, orange; and other numerous modifications, all producible by the mixture of simple colours. It would extend this article to too great a length to detail the processes for each colour separately. The principle is nearly the same in all. Gall-nuts, pyrolignite of iron, logwood, copperas, and verdigris, are the chief materials for producing black. Walnuts, sumach, madder, cochineal, cudbear, acetate of iron, catechu, Brazil wood, arnotto, are all employed in producing brown. Indigo, Prussian blue, and woad, are employed for blue. Fustic, Persian berries, quercitron, turmeric, and weld, for yellow. Cudbear, Brazil wood, cochineal, kermes, lac, logwood, madder, safflower, for red; and various compounds for purple, green, orange, &c.

The black dye for hats is communicated by logwood, copperas, and verdigris, mixed in certain proportions in the same bath; from that mixture there results a vast quantity of an ochreous muddy precipitate, which takes some trouble to remove, and which increased chemical knowledge would obviate altogether. A good black may be dyed upon an indigo ground with 100 pounds of wool, by taking 200 pounds of logwood, 60 pounds of sumach, 2¼ pounds of galls, and 20 pounds of green copperas; and giving three heats of two hours each to the wool, with airings between. A good black, without an indigo blue ground, may be given to 100 pounds of wool, by boiling it in a bath of 25 pounds of alum and 6¾ of tartar; grounding it with weld and madder; then passing it through a bath of 200 pounds of logwood, 60 of sumach, and 2½ of galls; taking it out, adding to the bath 20 pounds of copperas; lastly, giving it three heats of two hours each time. The ordinary proportions used by the English black dyers for 100 pounds of cloth, previously treated in the indigo vat, are about 5 pounds of copperas, as much nut-galls bruised, and 30 pounds of logwood. They first gall the cloth, and then pass it through the decoction of logwood in which the copperas has been dissolved. A finish of weld is often given after fulling.

Silk is dyed black in two methods, according to the market for which it is made. When sold by weight, it is an object with the dyer to load it with as much colouring or other matter as possible. When silk is sold by superficial measure, on the other hand, it becomes the dyer's object to give it a black colour with as little weight of materials as possible. Hence the distinction well known in trade of heavy and light silks. The silk dyers keep up from year to year a black vat, often of very complex composition. The essential constituents of the vat are sulphate of iron and gum; but many vegetable matters, as well as filings of iron, are usually added. This bath being heated short of boiling, and then allowed to settle for about an hour, the silks are worked in it with much manipulation, occasional wringing out, airing, and redipping. As the copperas and gum get exhausted, the bath must be replenished with these ingredients in due proportions. The addition of logwood and verdigris is very useful to the black silk dye, and is now generally made. A ground of walnut peels is a good and cheap preparation for this dye.

The infusion of walnuts, as used by the continental dyers, affords very agreeable and perma-

nent brown tints without any mordant, while it preserves the downy softness of the wool, and requires but a simple and economical process. In dyeing with this infusion, a quantity of it proportional to the shade required is to be put into the copper, diluted with water, and made to boil. The cloth or yarn needs merely to be moistened beforehand with tepid water, to be then plunged in the bath, and turned about till sufficiently dyed. Some dyers, however, give the stuff a preparatory mordant of alum, and leave it to drain for twenty-four hours before subjecting it to the bath of walnut-peels. Sumach is usually employed in this country to dye fawns, and some browns; but more beautiful browns may be given to woollen stuffs by boiling them first with one-fourth their weight of alum and some tartar and copperas; washing, and afterwards dyeing them in a madder bath. The shade of colour depends upon the proportion which the copperas bears to the alum. The finest browns are produced by boiling each pound of the wool with two ounces of alum, dyeing it in a cochineal bath, and then transferring it into a bath containing a little cochineal darkened with acetate of iron. Instead of cochineal the archil or cudbear bath may be used with a little sumach or galls. This forms a cheaper but a more fugitive colour.

Silk may receive a ground of arnotto, and then be dyed in a bath of logwood or Brazil wood, whereby a fine brown tint is obtained. Catechu is used for giving a bronze and brown to cotton goods.

Additional details are given under the names of the colours and of the dye-materials, such as ARNOTTO, COCHINEAL, INDIGO, MADDER, &c.

DYER, JOHN, born in 1700, was the second son of a respectable solicitor of Aberglasney in Caermarthenshire. He received his education at Westminster school, and when that was completed began the study of the law, which he relinquished for painting. He then wrote his poem 'Grongar Hill,' which was published in 1727. Though he seems to have made but small proficiency in painting, he went to Italy to study, where he wrote the 'Ruins of Rome,' a descriptive poem, published in 1740. On his return to England, having a small independence, he retired into the country, entered into holy orders, and married a lady named Ensor, said to be a descendant of Shakspere. He died in 1758, shortly after the publication of his longer poem 'The Fleece.'

It is on the poem of his youth, 'Grongar Hill,' that Dyer's reputation depends. There is perhaps no depth of thought, no new idea in this work, but it is a most vivid and brilliant combination of pleasing images.

DYER, GEORGE, was born in London, March 15, 1755. He was educated at Christ's Hospital. In 1774 he entered at Emanuel College, Cambridge, and took the degree of B.A. in 1778. After being for a time usher at a free grammar-school, and several others, he returned to Cambridge, and became a dissenter. Of the life of Robert Robinson, a dissenting minister, in whose family he was tutor, which he afterwards wrote, Dr. Parr said that it was one of the best specimens of biography in the language. He officiated for some time at Oxford as a dissenting minister of the Baptist persuasion; but after relinquishing this duty, and again residing for some time in Cambridge, he finally settled in London in 1792. From that time till 1830 his time was employed at first as a reporter in the House of Commons (which occupation he abandoned after two months' trial of it), afterwards as a private teacher, finally in various literary undertakings. As he advanced in age his eyesight gradually failed, and at length he became totally blind. He died at his chambers in Clifford's Inn, March 2, 1841.

Dyer was a poet, a scholar, and an antiquarian, deeply versed in books and their history. As a poet he attracted notice, but not fame. As a scholar he edited some plays of Euripides and an edition of the Greek Testament; but he is best known as editor, or joint editor, of Valpy's combination of the Delphin, Bipont, and Variorum editions of the Classics, in a hundred and forty-one volumes, in which all the original matter and *additamenta*, except the preface, were contributed by him. As an antiquarian, his principal works are—'History of the University and Colleges of Cambridge,' 2 vols. 8vo., London, 1814; 'Privileges of the University of Cambridge,' 2 vols., 8vo, London, 1824; the first volume containing the charters, statutes, &c., the second being a supplement to the history; and in connection with these, 'Academic Unity,' 8vo., London, 1827, being a translation with additions of the 'Dissertatio Generalis' in the second work. Dyer published many other works of less note (a list of which is in the postscript of the second volume of the 'Privileges,' &c., just mentioned), and was a large contributor to the magazines.

DYKE (in Geology), a fissure caused by the dislocation of strata, commonly also termed a *fault*, or *trouble*, and when it is small, a *slip* or *hitch*. Dykes are of frequent occurrence, and often extend several miles, penetrating frequently to an unknown depth. They must have been produced by some violent disturbances, and the amount of dislocation of necessity would vary in proportion to the intensity of the disturbing force. The strata are in all cases uplifted on one side of the dyke higher than those on the other side, sometimes, as in a *slip*, only a few inches, and sometimes, as in a *dyke*, many fathoms. Some dykes consist of basalt and other igneous rocks, which seem to have been injected into them in a state of fusion, but for the most part dykes are filled with the broken materials of the strata through which they pass. [COAL FIELDS; GEOLOGY.]

DYNAM. In estimating the effect of mechanical labour, it is desirable to have some idea of a simple unit well fixed in the mind. All who have studied know how much advantage there is in referring every kind of pressure to weight, and measuring it by the weight which will balance it. Thus if one hundred pounds weight will bend a spring into a certain position, we have no difficulty in substituting an opposite force to the weight for

the recoil of the spring at the point of application. It is equally convenient to arrive at a distinct notion of a unit of useful effect in the workmanship of machines. We may consider any machine as simply applied to raising a weight, and look upon the weight raised as a dynamical synonyme for any possible effect that the machine could have produced; observing that the useful effect of any application of power varies jointly as the weight raised, and the height to which it is raised. Accordingly, the product of the number of pounds raised, and the number of feet to which it is raised, is a *relative* measure of the quantity of power.

We can convert the above relative measurement into an absolute form by assuming as a unit one pound raised through one foot: let this be called a *dynam*, or dynamical unit. Thus, what is commonly called a horse power is meant by our engineers to signify 550 dynams in a second: a steam-engine which can raise one pound through 550 feet in every second is said to be of one-horse power.

This term was introduced by French writers, who called the effect of a cubic metre of water raised through one metre, a *dynamie* or *dyname*. Dr. Whewell ('Mechanics of Engineering,' Cambridge, 1841, 8vo., p. 150) proposed to naturalise the term dynam, as applied to our most convenient units, the pound and the foot. Mr. Watt was really the first who assumed, as a dynamic unit, the simple notion of one pound raised one foot: but he did not venture on a name, though the now common term, the *duty* of an engine, first used by him, has reference to the number of such simple units as may be obtained from the engine.

DYNAMETER. [Micrometer.]

DYNA'MICS (δύναμις, force), a word of comparatively modern use, now universally adopted as signifying the science of matter in motion, as distinguished from *statics*, which relates to matter at rest. Under so general a term, our plan requires us simply to refer the reader to the several articles connected with the subject.

Dynamics may be divided into two distinct parts: the mathematical consideration of motion, *without reference to any connection with its cause*; and the experimental investigation of the connection between pressure and the motion produced by it, together with the mathematical exhibition of the laws under which the second is a consequence of the first. The different branches of the subject, mathematical and experimental, are treated of under the heads Motion; Motion, Laws of; Forces, Impressed and Effective; Virtual Velocities, &c.

DYNAMO'METER (measurer of power), a term which has been applied to an instrument which measures any thing to which the name of power has been given, whether that of an animal, or (to take a very different instance) of a telescope.

DYNO'MENE, a genus of brachyurous crustaceans belonging to the division *Notopoda*, founded by Latreille.

Character.—Ocular pedicles longer than those of *Dromia*. Shell wide, nearly heart-shaped and truncated posteriorly, hairy or bearded. Two posterior feet only, dorsal, and much smaller than the others.

Example.—*Dynomene hispida* the only species known to M. Latreille. Locality, Isle of France.

DYRRHACHIUM. [Durazzo.]

DY'SENTERY (δυσεντερία, *Dysenteria*, from δύς, *with difficulty*, and ἔντερον, *intestine; difficultas intestinorum, bloody flux*), a disease in which there is difficulty and pain in passing the stools, which consist of mucus and blood, containing little or no fæculent matter, and generally attended with fever. The desire to evacuate the bowels is frequent and urgent, but the effort is accompanied with severe pain, and is often altogether ineffectual, constituting the affection called tenesmus. What scanty stools are passed consist, as has been stated, of mucus mixed with blood, or of pure blood in considerable quantity; and if any fæculent matter be present, it is commonly in the form of round and hard balls called scybalæ. There is always griping pain in the abdomen. More or less fever is invariably present. The seat of the disease is chiefly in the large intestines: the disease itself consists essentially of inflammation of the mucous membrane.

The forms of this disease, the causes which produce it, the circumstances under which it prevails, the pathological conditions on which its essential characters depend, and its degrees of intensity, are infinitely various.

In hot climates this disease is most intense. The heat, the tormina, and the tenesmus, are most urgent and distressing; the thirst becomes excessive, the urine scanty or altogether suppressed, the stools slimy, streaked with blood, and attended with *prolapsus ani*, or watery and ichorous, 'resembling the washings of raw beef, in which float particles or even large shreds of coagulable lymph,' thrown off from the acutely inflamed surface.' In these cases the prostration of strength is extreme, and is increased by most distressing and exhausting vomiting. When, as sometimes happens in this form of the disease, portions of the mucous coat of the intestine slough away, the countenance of the patient is sunk and cadaverous, and the odour of the stools, and in some degree, indeed, of the whole body, is putrid.

The duration of dysentery is as various as its types. It may prove fatal in a few days or hours, or last for weeks and even months, and ultimately destroy life by inflammation and gangrene of the bowels.

The causes which predispose to dysentery appear to be long-continued exposure to a high temperature, or alternations of heat and cold; hence the disease is generally most prevalent in summer or autumn, after considerable heats have prevailed for some time, and especially after very warm and at the same time very dry states of the weather. Persons addicted to drinking spirituous liquors are more liable to it than others.

In the acute form of dysentery, when the fever is high, the pain intense, and the inflammation active, blood-letting from the arm is indispensable, which must be repeated till the acute inflammatory symptoms are subdued. After the inflam-

matory state has been subdued by blood-letting, and the evacuation of the accumulated fæces by mild purgatives, the great object is to soothe the irritated membrano by opiates, on the judicious employment of which, and the skilful combination and alternation of this class of remedies with mild purgatives, the successful treatment of ordinary dysentery mainly depends. It is seldom however that the dysentery of our own climate requires general blood-letting, although the application of leeches may be sometimes useful.

DYSPE'PSIA (δυσπεψία, *dyspépsia*), *Indigestion*, the difficult and imperfect conversion of the food into nutriment.

The causes of dyspepsia are either those which act directly and immediately upon the stomach itself, or those which act upon the whole body or upon particular parts of it, but which still affect the stomach principally and almost solely.

Of the first kind are noxious, irritating, and indigestible substances taken into the stomach as articles of food or drink, such as tainted meat, decayed vegetables, unripe fruit, very acid matters, ardent spirits, &c.; and even wholesome food taken too frequently or in too large a quantity, especially when its nature is very nutritious, as when it consists principally of animal matter, or when a large quantity of nutriment is presented to the stomach in a very concentrated form, or is rendered too stimulating by being highly seasoned; the abuse of fermented and spirituous liquors, which is one of the most frequent causes of dyspepsia in its severest and most fatal forms; and large quantities of fluids, habitually taken at too high a temperature, as very hot tea, coffee, or soup.

Of the second kind, or the causes which act upon the body generally, the following may be mentioned:—Want of pure air; hence the frequency of dyspepsia in large and crowded cities, and more especially in narrow and confined lanes and alleys, in the dirty and ill-ventilated houses of the poor. Want of exercise: from physical inactivity all the organs of the body languish, but the stomach first and most. Intense study or close application to business too long continued, implying both want of air and want of exercise. Mental emotion, more especially the depressing passions, fear, grief, vexation, disappointment, anxiety, and hope deferred. Exposure to the influence of cold and moisture. In persons with weak stomachs and delicate skins, a cold damp day, more especially suddenly succeeding a hot day, often produces a severe attack of dyspepsia. Hence it is that dyspeptic complaints are so prevalent when cold and damp weather first sets in. Excessive discharges from the body, as flooding, leucorrhœa, large bleedings from the arm, profuse and long-continued sweating, and above all protracted suckling.

The state of dyspepsia is most frequently a state merely of disordered function, without any appreciable change of structure in any of the tissues of the stomach. But all the symptoms of dyspepsia are produced in their intensest degree when they arise from some organic disease of the stomach. Of these the most frequent is inflammation of its mucous coat. This inflammation may be either acute or subacute. When acute, the nature of the malady is indicated by characters so striking that it cannot be overlooked; but the subacute form often exists for a long period quite unsuspected, producing violent and obstinate dyspepsia, which is often greatly aggravated by the remedies employed to remove the complaint.

Dyspepsia is often the result of disease situated not in the stomach, but in some other organ. The organs the diseases of which are most apt to produce disorder of the stomach are—the liver, the spleen, the uterus, the kidney, the bronchi, and the skin.

The indications of cure are to avoid or remove the remote causes, to remove the symptoms which especially contribute to aggravate and continue the disease, and to restore the healthy tone of the disordered organs. There is no drug, no class of medicines, no one mode of treatment capable of removing dyspepsia when present, or of preventing its recurrence. This can only be done by a careful study of the exact cause of the disease in every individual case, and the precise seat and nature of the affection. The mode of treatment must be modified in strict accordance with these circumstances; and no mode of treatment will be attended with success of which the appropriate regulation of the diet and exercise does not form an essential part.

DYTI'SCIDÆ, a tribe of pentamerous coleopterous insects, founded on the genus *Dytiscus* of Linnæus. It now includes the following genera:—*Pœlobius, Matus, Coptotomus, Eunectes, Agabus, Ilybius, Colymbetes, Acilius, Hydaticus, Dytiscus, Cybister, Copelatus, Anisomera, Laccophilus, Noterus, Hydrocanthus*, and *Suphis*.

The insects composing this genera are almost all oval and flattened in form. They are very variable in size, some being very minute, others several inches in length. Their four posterior extremities are longer than the anterior, flattened, and ciliated. They are all aquatic insects, and organized for swimming, though at the same time capable of flying through the air with facility. They live in fresh water, and swim with great rapidity, chasing other water insects, and seizing them with their anterior feet. Although capable of existing a long time under water, they are obliged to ascend at intervals to the surface to breathe. This they effect by remaining quiet, when their bodies, specifically lighter than the surrounding fluid, rise to the surface obliquely, with their heads downwards, so that the extremity of the abdomen, at which the stigmata of the tracheæ are situated, is exposed to the air on reaching the surface. At night they fly from one pool to another, and hence are often met with in places flooded by temporary rains. The larvæ of the *Dytiscidæ* leave the water and bury in the earth before changing into pupæ. Thus they are at first aquatic insects, next terrestrial, and in their final stage amphibious.

The typical genus *Dytiscus* has engaged the attention of *Dr. Aubé*, who enumerates ten European, one African, and six American species.

E occupies the fifth place in the Hebrew alphabet and those derived from it. The vowels, when arranged according to their physical affinity, would lie in the series, *i, e, a, o, u*, and accordingly *e* is frequently interchanged with *i* and *a*, and occasionally with *o* and *u*.

1. *E* is interchanged with *i*. In Latin the old datives *heri, mani, ruri, musai*, afterwards took the forms *here, mane, rure, musae;* and the words *magis, videris, tristis*, when written without an *s*, were *mage, videre, triste*. The same interchange appears in the declension of the adjective *is, ea, id*, and the conjugation of the verbs *eo* and *queo*.

2. *E* in Latin often corresponds to *oi* in French. Thus many Latin infinitives in *ere* reappear in French with the termination *oir*, as *habere, debere; avoir, devoir*. The Latin past imperfect has the suffix *eba*, which passed through the forms *eva* and *ea* to *oie* and *oi*. Thus from *habebam* were deduced *aveva, avea, avoie*, and lastly *avois*, or *avais*. This final *s* does not appear in the oldest forms of the French language. Other instances of this change are *Viennensis, Viennois; mensis, mois*.

3. *E* Latin into *ie* French, as *mel, bene, ped, venit; miel, bien, pied, vient*.

4. *E* into *a*. This is well marked in the dialects of the Greek; σοφιη, Ionic; σοφια, Doric. Hence the Latins have often an *a* where the common dialect of the Greek had *e*, as μηχανη, πλαγη; Lat. *machina, plaga*. Both forms often co-exist in Latin, as *tristitia* and *tristitie*. The *a* is often changed into *e* in Latin, if a prefix is added, particularly if two consonants follow the vowel, as *factus, confectus; pars, expers; castus, incestus*. [A.]

5. *E* into *o;* especially in Greek, as λειγω, λογος; νεμω, νομος. The Latin language prefers the *o*, as *emo, vomo; coquo; nos, novus*. This change is particularly common in words beginning with a *w*, or with what was pronounced as a *w*, the Latin *v*. Thus *vester, velim, verto, vetо*, were once written *voster, volim, vorto, voto*. Hence likewise to the Latin *vermis, vellus, verruca* correspond our English *worm, wool, wart*. While the German *schwert* is in English *sword;* and *vice versa* the German *antwort* (as it were *anti-word*) is in English *answer*. Lastly, our own *worm* (vermis, Lat.), and *work* (ϝεργον, Gr.), are now pronounced as if written with an *e*. The Greek even interchanges a long *o* with a long *e*, as πατηρ, πατερ, πατορ. So in Latin *Anio, Anienis*.

6. *ĕ* in Greek is changed into *u* in Latin before an *l*, as Σικελος, Siculus, ιλιλιλιλιν, *ululare*.

E, in Music. [Diatonic; Gamut; Scale.]

EADMER, or EDMER, the friend and historian of Archbishop Anselm, lived in the twelfth century. He received a learned education, was a monk of Canterbury, and became the bosom friend and inseparable companion of two archbishops of that see, St. Anselm and his successor Ralph. In 1120, by the desire of Alexander I. of Scotland, he was elected bishop of St. Andrews: but as Alexander refused to allow him to be consecrated by the archbishop of Canterbury, for which Eadmer contended, he abandoned his bishopric, returned to England, and died, it is said, in 1124. Eadmer is now best known for his history of the affairs of England in his own time, from 1066 to 1122. The best edition is that by Selden, intitled 'Eadmeri Monachi Cantuariensis Historiæ Novorum, sive sui Sæculi, Libri Sex,' fol., London, 1623. His life of St. Anselm was first printed in 12mo., at Antwerp, in 1551, under the title of 'Fratris Edmeri Angli de Vita D. Anselmi Archiepiscopi Cantuariensis, Libri Duo.' Others of his works, with the 'Historia Novorum,' were given at the end of Father Gerberon's editions of the works of St. Anselm, fol., Par., 1675 and 1721. His Lives of St. Wilfrid, St. Oswald, St. Dunstan, &c., with that of St. Anselm, were inserted by Wharton in his 'Anglia Sacra.'

EAGLE. [Falconidæ.]

EAGLE, Roman Standard. The eagle is often seen on ancient coins and medals, as on those of the Ptolemies of Egypt and the Seleucidæ of Syria. As an ensign or standard, borne upon a spear, it was used by the Persians in the time of the younger Cyrus. (Xenoph. 'Anab.' i. 10.)

Pliny ('Hist. Nat.' x. c. 4, ed. Hardouin) says that, till the time of C. Marius, the Romans used five different animals for standards—the wolf, the minotaur, the horse, the boar, and the eagle—but that in the second consulship of Marius they adopted the eagle as the sole ensign for their legions.

The eagle used by the Romans as a standard was of gold or silver. It was borne on the summit of a spear, and was of the size of a pigeon, with its wings displayed. The name of the legion was usually engraved upon it. Tacitus ('Annals,' i. 60) relates the finding of the eagle of the 19th legion by Germanicus, which had been lost in the massacre of Varus.

A Roman eagle in steel, found at Silchester, presumed to have been a legionary eagle, was exhibited to the Society of Antiquaries in 1788.

(Le Beau, *Quatorzième Mémoire sur la Légion Romaine; Des Enseignes; Mém. de l'Académie des Inscript.* tom. xxxv. 4to. Par. 1770, pp. 277–308.)

EAGLE-WOOD, one of those substances of which the name, from similarity of sound in a foreign language, has been converted into another

having no reference to its original signification. It is a highly fragrant wood, much esteemed by Asiatics for burning as incense, and known in Europe by its present designation ever since the Portuguese visited and imported the substance direct from the Malayan islands and the kingdom of Siam, where it has always been abundant, and long established as an article of commerce. The Malayan name is *Agila*, whence the wood was called *Pao-d'Agila* by the Portuguese, and has since been converted into *Pao-d'Aguila*, and *Pao-d'Aquila*, *Bois-d'Aigle*, and *Eagle-Wood*.

This term is also applied to the wood known to the ancients by the name of *Agallochum*.

Of the two kinds of agallochum which are most valued, and both considered genuine, one is distinguished by the name of Calambac, and the other as the Garo of Malacca. Calambac appears, as far as hitherto known, to be a native of Cochin China only, growing on the mountains of that country in about 13° of N. lat., near the great river Lavum, which may be the Maykiang, flowing between Cochin China and the Laos. It has been described as a lofty tree with erect stem and branches, long lanceolate shining leaves, and terminal bunches of flowers. The other kind, Garo, to which the name of Eagle-Wood is more frequently applied, has long been an article of export from Malacca and the kingdom of Siam. Specimens of the tree which yield this were first obtained by M. Sonnerat in his second voyage to India, from which probably have been given the figure and description by Lamarck. The fragrant nature of genuine agila or eagle-wood is well known, and that it has from very early periods been employed both by the natives of India and of China as incense. Mr. Finlayson, in his visit to Siam, says, that the consumption of this highly odoriferous wood is very considerable in Siam, but that the greatest part is exported to China. In China it is used in a very economical manner. The wood being reduced to a fine powder and mixed with a gummy substance is laid over a small slip of wood, about the size of a bull-rush, so as to form a pretty thick coating. This is lighted, and gives out a feeble but grateful perfume. French authors inform us that the Eagle-Wood was burned as a perfume by Napoleon in the imperial palace.

EAR. The only essential part of the organ of hearing is a nerve, not materially different from those of common sensation, lodged at a sufficient depth to be secured from external injury, and sufficiently sensitive to be affected by the delicate impulses of atmospheric undulations. This is called the acoustic or auditory nerve.

Amongst the invertebrate animals, the *Radiata* (star-fish, sponges, &c.), which constitute the lowest division of the animal kingdom, appear to be universally unprovided with an organ of hearing: many of them have no nervous system, and are therefore probably altogether devoid of the sense.

The *Articulata*, which form the next division, are all furnished with a nervous system, and it is likely that they all enjoy the sense of hearing. The parts of the ear which are found in these animals are a cavity which is called the vestibule; a soft membranous bag of fluid called the vestibular sac; a round external opening, called, from its shape in man and most other animals, the fenestra ovalis. There are fluids within and without the sac. The principal tribes of the *Articulata* ascertained to possess organs of this kind are the air-breathing insects of the orders *Hymenoptera* (bees), *Orthoptera* (grasshoppers), and *Coleoptera* (beetles), the *Arachnida* (spiders), and the *Decapodous crustacea*, such as the lobster and crab.

The *Mollusca*, though placed higher in the scale of animals by Cuvier, do not afford so many examples of animals possessing a distinct organ of hearing as the *Articulata*. Such as have been discovered all belong to the order of the *Cephalopods* with two branchiæ, or gills, which approach more nearly to the true fishes in their structure than the other mollusks.

The vertebrated classes of the animal kingdom, comprising the true fish, reptiles, birds, and the mammalia, are all provided with acoustic organs, which are very various in their degrees of complexity, but much exceed in that respect the comparatively simple organs of the inferior divisions.

In the cartilaginous fishes, such as the ray and the shark, the vestibule is deeply imbedded in the elastic walls of the back part of the cranium, near its junction with the spine. The fenestra ovalis, closed by a tense transparent membrane, faces upwards, backwards, and towards the middle line, and which may be considered as a rudiment of the tympanum, or middle ear, of the higher vertebrata, with its Eustachian Tube. The inner surface of the membrane is turned towards three *sacculi*, one of which is much larger than the rest, arranged at the opposite side of the cavity of the vestibule, and containing each an otolithe. Besides the fenestra ovalis, other perforations lead out of the vestibule into three arched cylindrical canals of considerable diameter and dimensions, the diverging curves of which take a wide circuit within the cranial cartilage, and terminate at both ends in this central cavity. Within the canals, in which the vestibular perilymph freely circulates, there are three similarly curved but more slender membranous elastic tubes: they are nowhere in contact with the sides of the canals, but are suspended in the midst of them by means of cellular network. They all swell out at one end like a flask (*ampulla*) as they enter the vestibule, after which the anterior and horizontal tubes separately enter a common pouch, or sinus. Into this their other ends likewise open by a conduit common to both. The acoustic nerve is distributed in two principal branches only to the sacs and the ampullæ; chiefly to the latter, to which it gives a white colour.

In serpents there is but one sacculus containing chalky matter, and all the semicircular tubes communicate with a central membranous sinus, which the anterior and posterior tubes enter by a common trunk. The fenestra ovalis is closed, not as in fishes by a membrane, but by the expanded trumpet-shaped extremity of a slender bone (*ossiculum* or *columella*) attached at the other extremity by a ligament to the outer end of the intermaxillary bone.

Nearly the same arrangement of the internal ear prevails in the four-footed reptiles (turtle, crocodile, frog, lizard); but a new and important step is here made towards the ultimate perfection of the organ by a development of an air-cavity, called the tympanum, or ear-drum, between the vestibule and the surface of the head.

In birds, besides a greater nicety and tenuity in the conformation of the parts hitherto described, the ear is furnished with two additional provisions. The first is a short *meatus auditorius externus*, or outer passage, which removes the delicate membrane of the tympanum to some depth from the surface of the head, and thus places it more securely, and, at the same time, to greater advantage for observing the direction of sound. The other additional provision in birds is an appendage to the mechanism of the internal ear. This is a small conical cavity in the bone, somewhat curved, with a double spiral ridge winding round the interior, and inclosing a cartilaginous structure so corresponding in form with the ridge as to divide the cavity into two partitions. These communicate with another at the apex, and with the vestibule and tympanum respectively, at their other ends. The cavity is termed the cochlea, from its resemblance to a spiral shell.

In the mammalia the ear reaches its complete development. It is nearly the same in all of them, including man; the difference being only in the comparative size and shape of the component parts of the organ, and not in their essential structure, number, or arrangement.

The parts of the ear may be described under a three-fold division of the internal, middle, and external ear.

1. The internal ear, comprising the acoustic nerve, vestibule, and labyrinth, is deeply placed in the interior of the head, within the rocky portion of the temporal bone. Near the inner point of this portion of the temporal bone which nearly meets its fellow on the other side, and upon its posterior declivity, there is a large trumpet-like hole (*meatus auditorius internus*) into which the seventh cerebral nerve enters from the *medulla oblongata*. After penetrating about half an inch, it splits into several sets of filaments, and finds its way through small sieve-like openings at the bottom of the lower fovea into the internal ear, and is here distributed in three separate portions to the cochlea, the ampullæ of the semicircular tubes, and the *utricle*, or vestibular sac. The *cochlea* is more complicated than in birds; it consists of a spiral canal in the bone, gradually diminishing as it ascends to a point, wound round a central hollow pillar of bone, called the *modiolus*. From its inner surface, that namely which may be considered as a groove in the modiolus, a thin and spongy lamella of bone projects rather more than half across the canal, ascending in a similar spiral. From the edge of this lamella (called the *lamina spiralis*) a membrane passes to the outer surface of the canal, where it is attached; thus completing the separation of the canal into two *scalæ*, or winding partitions, which unite at the summit, and open (as before), the lower and narrower into the vestibule, the superior and larger into the tympanum; each scala taking two turns and a half round the modiolus in ascending from the base of the cochlea to the cupola, or inverted cup-shaped cavity at the summit, placed over the funnel (*infundibulum*) into which the top of the modiolus expands. The modiolus is hollow to some distance from the base. Up this tubular cavity rises the large cochlear branch of the acoustic nerve, giving off lateral filaments through minute openings arranged spirally, which pass through the light spongy bone, and emerge from different points on the spiral floors and sides of the scalæ, where they ramify in a delicate pulpy expansion upon the membranous tubes which line the spiral osseous canals: the rest of the cochlear nerve passes through capillary perforations in the cul-de-sac of the tubular cavity, and ascending in the substance of the central pillar of the modiolus, is distributed through the bone in a similar way to the upper turns of the cochlea and the infundibulum. The two other branches of the acoustic nerve are distributed to the vestibular sac, which lies in a round depression or pit in the barrel-shaped cavity of the vestibule, and to the ampullæ of the semicircular tubes. The principal opening from the vestibule is the fenestra ovalis, situated on the outer side towards the tympanum, which is closed by a membrane; at the lower and front part there is another opening into the scala vestibuli of the cochlea. There are five openings at its posterior and outer side, which lead into the semicircular canals, of which the superior and posterior enter the vestibule by a common foramen. The sac and utricle each contain a cretaceous deposit, which, in some of the lower mammalia has the consistence of soft chalk. The cochlea and semicircular canals, from their complexity, are termed the *labyrinth*.

2. The *middle ear* comprises the cavity of the *tympanum*, with its contents; the cells in the bony prominence behind the ear, called the *mastoid process*, with which the tympanum communicates; and the *Eustachian Tube*, or passage leading from the tympanum into the upper and back part of the throat, where it opens in the form of an expanded slit on each side behind the posterior nares.

The tympanum is an irregular cavity scooped in the petrous portion of the temporal bone between the vestibule and the external meatus. The principal entrances to it are the fenestra ovalis and the round or somewhat oval opening at the bottom of the external passage upon which the membrana tympana is stretched. Between these there is extended a chain of three small bones, obliquely articulated to each other with perfect joints, so placed that the chain somewhat resembles in figure the letter Z.

Bones of the Ear, of their natural size. *m*, malleus; *i*, incus; *s*, stapes; *o*, orbiculare.

These bones are called respectively the *stapes* (stirrup), the *incus* (anvil), and *malleus* (hammer), from some similarity in form to those implements. The base of the stapes is applied to the fenestra ovalis, exactly fitting it, and is attached firmly to

its membrane. The extremity of the longer leg of the incus is articulated to the head of the stapes, and there is a minute bone between them of the size of a small shot, which is generally considered to be only a process of the incus. It is howeve, called from its spherical shape the *os orbiculare*, and is sometimes reckoned as a fourth bone. The shorter leg of the incus rests against the bony parietes of the tympanum at the back part, near the mastoid cells. Upon the hollowed cavity in the head of the incus the lateral depression of the head of the malleus is articulated, and moves easily; the long handle of the latter is attached by its extremity to the middle of the membrana tympani, as well as by a portion of the side of the handle, which lies close to and parallel with the membrane. The long slender process of the malleus lies in a slit passing to the articulation of the jaw called the glenoid fissure.

The use of these bones is undoubtedly to transmit the vibrations of the membrana tympani to the membrane of the fenestra ovalis, and thence to the internal ear, and thus to permit the membrana tympani to be drawn into a conical shape so as to tighten it, and adapt it either to resist the impulse of too loud a sound, or favour a more acute or gentle one. This is done by a series of small muscles which are not under the dominion of the will, being supplied with nerves in a way peculiarly interesting to a physiologist, and acting automatically in correspondence with the impressions on the auditory nerve.

The fenestra ovalis is situated nearly opposite the membrana tympani, on the upper edge of a prominence called the *promontory*, and beneath it is the *foramen rotundum*, closed by a membrane, and leading into the cochlea by the scala tympani. Besides these openings from the tympanum, there are others which lead into the mastoid cells behind it. These are also filled with air, and are supposed to contribute to the distinctness of the tympanic vibrations. There is also an opening from the tympanum forwards into the Eustachian Tube.

Deafness arising from closure of the Eustachian Tube has been sometimes cured by dilating that canal by instruments passed for that purpose into its outer expanded extremity through the nostrils, or from the back of the throat; or by injecting fluids into it by means of a syringe with a small curved pipe.

3. The external ear consists of the *meatus auditorius externus* and *concha*. The former, commencing from the membrana tympani, is an osseous canal in the first part of its course in the adult, and then becomes nothing more than a tubular continuation of the expanded cartilage of the concha, or outer appendage of the ear. It is lined throughout with a delicate skin, covered by thin cuticle, which also covers the outer surface of the membrane. Beneath the skin, and opening through it on the surface, are numerous glandular follicles which secrete the ear-wax, or *cerumen*. The wax, which is very bitter, serves to prevent the entrance of insects and to keep the skin soft. When secreted too abundantly, it is often a cause of deafness, and should be removed as a foreign body by means of a syringe and a solution of soap in warm water. The commonest kind of ear-ache is that caused by inflammation of this passage, and is generally followed by a copious and fœtid secretion poured out by the ceruminous follicles. If this last long, deafness is sometimes the result from thickening of the membrane, and has been removed, as well as that arising from closure of the Eustachian Tube, by puncturing the membrane.

The *concha*, or *pinna*, or *auricle* (for by all these names the outer appendage of the ear is known), consists of several pieces of elastic cartilage expanded in a form more or less resembling an ear-trumpet in different animals. In man it serves the purpose of collecting the sonorous vibrations and directing them into the meatus externus much less perfectly than in many other animals, which are also provided with muscles for directing it to the source of sound, which in man are but rudimentary.

EAR-RING, a ring hung from a hole, perforated for that purpose through the ear, sometimes set with pendant jewels, pearls, or other precious stones. In the Latin of the middle age ear-rings are termed *pendentes*, from the more common form of the ornaments usually attached to the ring itself.

EAR-TRUMPET, an instrument employed to aid defective hearing, by collecting and concentrating the waves of sound, so that they may impinge upon the tympanum with increased force. It is in principle the reverse of the speaking-trumpet. Many varieties of ear-trumpets are made, under the names of *auricles*, *ear-cornets*, *ear-conchs*, *conversation-tubes*, and *table-sonifers*, adapted to different requirements of partially deaf persons.

EARL. The title of count or earl, in Latin *comes*, is the most ancient and widely spread of the subordinate or subject titles. By the English it is called earl, a name derived to us from the ealderman of the Anglo-Saxons and the jarle of the Danes. By the French it is called *comte*, by the Spaniards *conde*, and by the Germans *graf*, under which title are included several distinct degrees of rank—landgraves or counts of provinces, palsgraves, or counts palatine, markgraves, or counts of marches or frontiers (whence marchio or marquess), burggraves, or counts of cities, counts of the empire, counts of territories, and several others. [COUNT; BARON.]

After the battle of Hastings, William the Conqueror having annexed the feudal title of earl to the counties of the Saxon earls (with whom the title was only official), granted them to his principal captains.

These earldoms were of three kinds, all of which were by tenure. The first and highest was where the dignity was annexed to the seisin or possession of a whole county, with 'jura regalia.' In this case the county became a county palatine, or principality, and the person created earl of it acquired royal jurisdiction and *seigniory*. The second kind of earls were those whom the king created earls of a county, with civil and criminal jurisdiction, with a grant of the third part of the profits of the county court, but without giving them actual seisin of the county. The third kind

was where the king erected a large tract of land into a county, and granted it with civil and criminal jurisdiction to be held *per servitium unius comitatus*.

Under the early Norman kings, all earls, as well as barons, held their titles by the tenure of their counties and baronies; but with the solitary exception of the earldom of Arundel, earldoms by tenure have long since disappeared, and in late times the title has been conferred by letters patent under the great seal. Earls have now no local jurisdiction, power, or revenue, as a consequence of their title, which is no longer confined to the names of counties or even of places.

The number of earls in the House of Lords is at present 117.

EARL MARSHAL OF ENGLAND, one of the great officers of state, who marshals and orders all great ceremonials, takes cognizance of all matters relating to honour, arms, and pedigree, and directs the proclamation of peace and war. The *curia militaris*, or court of chivalry, was formerly under his jurisdiction, and he is still the head of the heralds' office, or college of arms. The office is now hereditary in the family of Howard, and is enjoyed by the Duke of Norfolk.

EARLE, JOHN, was born at York about the year 1601. He was sent to Oxford, and entered as a commoner at Christchurch College, in 1620; admitted as a probationary fellow of Merton College; proceeded M.A. in 1624, and D.D. in 1642. He was in orders in 1631, and became rector of Bishopstone in Wiltshire, chaplain to Prince Charles, and chancellor of the cathedral of Salisbury. Of all these preferments he was soon deprived by the civil wars. After the battle of Worcester he fled from England, and, meeting Charles II. at Rouen, was made his chaplain and clerk of the closet. Earle remained abroad during the whole exile of his master. Immediately after the Restoration he was made dean of Westminster. In 1662 he was consecrated bishop of Worcester, whence he was translated in the next year to the see of Salisbury. He died November 17, 1665. His tomb stands near the high altar of Merton College Chapel. Bishop Earle is now remembered on account of his work called 'Microcosmography, or a Piece of the World discovered, in Essays and Characters,' 8vo., 1628. In addition to this work, which has been several times reprinted, Bishop Earle was author of a few poems, and of a Latin translation of the 'Icon Basilike.'

EARLOM, RICHARD, a distinguished English engraver, was born in the early half of the 18th century, and, according to Bryan, was still living in 1816. The dates of his works, which are very numerous, range between 1760 and 1790. As a mezzotinto engraver Earlom has never been equalled; his historical and other figure pieces in this line are excellent, but some fruit and flower pieces, after Van Os and Van Huysum, are of unrivalled beauty and effect. Earlom also executed many etchings and imitations of chalk drawings, the principal of which is the celebrated 'Liber Veritatis,' published by Boydell, consisting of a series of fac-similes from the original sketches of Claude Lorraine, in the possession of the Duke of Devonshire. Among his masterpieces are—the Royal Academy, after Zoffany; Lord Heathfield, after Reynolds; and the Iron Forge, after Wright. There is a list of his principal works in Bryan's 'Dictionary of Painters and Engravers.'

EARTH. The old chemists imagined that all material substances were ultimately resolvable into four simple bodies, viz. air, fire, water, and earth, which were therefore called the four elements. It is now universally admitted, that the bodies called earth are compounds of oxygen and a base, and in fact that they are mostly metallic oxides. The principal earths are alumina [ALUMINUM], barytes [BARIUM], glucina [GLUCINUM], lime [CALCIUM], magnesia [MAGNESIUM], silica [SILICIUM], strontia [STRONTIUM], yttria [YTTRIUM], zirconia [ZIRCONIUM].

EARTH (Astronomy). In the language of astronomers, the earth is rarely treated as a planet. All the phenomena connected with its motion are seen in the apparent motion of the SUN, to which article we therefore refer.

EARTH, DENSITY OF THE. [WEIGHT OF THE EARTH.]

EARTH, FIGURE OF THE. [GEODESY.]

EARTH, MOTION OF THE. [MOTION OF THE EARTH.]

EARTH-NUTS are either the fruit of certain plants which bury it below the ground after the flowering is past, as the *Arachis hypogœa*, *Lathyrus amphicarpos*, and others, or else the subterranean tubercles of fleshy-rooted plants, such as *Bulbocastanum*, *Cyclamen*, *Lathyrus tuberosus*, *Apios tuberosa*, and the like.

EARTHENWARE. [POTTERY.]

EARTHQUAKES are the most terrific of all natural phænomena. The solid surface of the globe is put in motion by them, and assumes an appearance which in some cases may be compared with the sea when agitated by the wind.

The least dangerous of these phænomena are those which by the Creoles of South America are called *Temblores*, a term which may be translated by *tremors*. The surface of the earth is put in a trembling motion, by which such objects as are not well supported are thrown to the ground, and even walls are split, but the damage does not extend farther. These tremors are by far the most common kind of earthquakes, and occur in some countries of South America, especially in Chile, almost every day, at least in certain seasons.

The *terremotos* of the Creoles, or proper earthquakes, give to the surface either horizontal oscillations, not dissimilar to the waves of an agitated sea, or they consist in violent perpendicular upliftings, so that it would seem as if repeated explosions were exerting their force against the roof of a subterraneous cavern, threatening to burst it open and to blow into the air every thing placed over it. By these earthquakes walls are overthrown, and fissures are produced in the ground. The latter are frequently more than a foot in width, and sometimes water gushes out of them like a fountain.

Earthquakes are generally preceded and some-

times attended by a subterraneous noise, which may be compared to the echo of distant thunder in a mountainous country.

Considerable changes may be produced on the surface of the globe by earthquakes. The coast of Chile has undergone a considerable change by earthquakes during the last twenty years. In 1825 the island of S. Maria (near 37° S. lat.) was upheaved nine feet, so that the southern port of this island has been almost destroyed, and the soundings round the island have diminished a fathom and a half everywhere.

The single shocks of an earthquake last from a few seconds to two or three minutes. Sometimes they follow one another at short intervals. Sometimes they are continued for several days, and even weeks; and in some places, as at Copiapo, in Chile, they are of daily occurrence.

Earthquakes are sometimes experienced over an immense tract of country. The earthquake in Chile, in 1835, was felt at all places between the Island of Chiloe (40° S. lat.) and Copiapo (27° S. lat.), and from the Island of Juan Fernandez to the town of Mendoza, on the east side of the range of the Andes. It consequently extended over 13 degrees of latitude, and 10 degrees of longitude. But when earthquakes extend over such an immense tract of country, some districts are always convulsed with greater violence, and these may be considered as the centre of the earthquake.

We know little, or rather nothing, of the origin or cause of earthquakes. It may however be considered as certain that they are due to the same agency which produces volcanic eruptions. These eruptions are frequently preceded by earthquakes.

Ancient authors, especially Thucydides, frequently mention earthquakes; but only in general terms. Yet we learn enough from these slight notices to show that they were often equal in violence to those which in modern times have convulsed the continent of Europe and Asia. ('Thucyd.' i. 101; iii. 89; v. 50; viii. 41.) No detailed description of an earthquake in Europe or in the old continent exists before that which, on the 1st of November, 1755, almost destroyed the city of Lisbon. This is the most destructive earthquake which has ever occurred in Europe. The number of persons that perished by it is stated to have been 30,000. In February and March, 1783, the north-eastern part of Sicily and the southern portion of Calabria were convulsed by repeated and very violent shocks, which overthrew the town of Messina, and killed many thousands of its inhabitants, as well as many persons in Calabria.

America is more subject to earthquakes than any portion of the Old Continent, but they are only strongly felt between 20° N. lat. and 40° S. lat.; and it is not the whole country included between these latitudes that is visited by them, but only the table-lands of the Mexican isthmus, the Andes, and the countries bordering on them, and those which are adjacent to the Caribbean Sea.

EARWIG. [FORFICULIDÆ.]

EASEMENT. An easement is a right which the owner of one piece of land, sometimes called the dominant land, has in respect of his ownership, by virtue of which right the owner of another piece of land, sometimes called the servient land, is obliged to allow the owner of the dominant land to do something on the servient land, or something which has relation to that land, or is himself obliged not to do something on that land; and this power on the part of the owner of the dominant land, or this duty to forbear on the part of the owner of the servient land, must be something that is for the benefit of the owner of the dominant land.

Easements may be divided into Affirmative and Negative. Examples of affirmative easements are, a right of way over a neighbour's land, or a right to discharge water through it, as in the case of a drain. An example of a negative easement is where the owner of land is prevented building on his own land or some part of it. Though the division into affirmative and negative easements is admitted by writers on English law, the different cases of easements are not always correctly referred to these two separate classes. There is a great number of these rights called easements, as many indeed as can exist by virtue of the contiguity of two pieces of land belonging to different owners, with or without buildings on them, and the convenience that may be derived to one piece of land or to one building from some limitation of the power of the owner of another piece of land or of another building, over his land or building.

The 2 and 3 Wm. IV. c. 71, has regulated the law of easements in some respects.

The term Servitutes, in the Roman law, is much more comprehensive than the term easements; but the law which relates to the class of Servitutes, called Urban and Prædial, comprehends most of the rules that are applicable to the doctrine of easements. ('Dig. 8.') The French law on Servitudes, or Services Fonciers, is contained in the 'Code Civil,' liv. ii. *tit.* 4.

There is an English treatise on the Law of Easements, by C. J. Gale and T. D. Whatley, London, 1839.

EAST, the point of the compass which is in a direction at right-angles to that of north and south, and which is towards the *right* hand of a spectator who faces the north. The distinction between east and west must ultimately be derived from a reference to the human body; for we can only define a spectator's *right* hand by saying that it is the hand which is not upon the same side as the heart.

EAST INDIA COMPANY. This association originated from the subscriptions of a few private individuals. It gradually became a commercial body with gigantic means, and next, by the force of unforeseen circumstances, assumed the form of a sovereign power.

The Company was first formed in London in 1599, when its capital, amounting to 30,000*l.*, was divided into 101 shares. In 1600 the adventurers obtained a charter from the crown, under which they enjoyed certain privileges, and were formed into a corporation for fifteen

years, with the title of 'The Governor and Company of Merchants of London trading to the East Indies.' The first adventure of the association was commenced in 1601; and this, as well as seven or eight subsequent voyages, yielded a commercial profit of 100 to 200 per cent. The charter was renewed for an indefinite period in 1609, subject to dissolution on the part of the government upon giving three years' notice to that effect. In 1611 the Company obtained permission from the Mogul to establish factories at Surat, Ahmedabad, Cambaya, and Goga. The capital was increased by a new fund of 1,600,000*l.* in 1617. The functions of government were first exercised by the Company in 1624, when authority was given to it by the king to punish its servants abroad either by civil or by martial law, embracing even the power of taking life. In 1632 a third fund of 420,700*l.* was raised. The king encouraged the formation of a rival company in 1636, but the rivals coalesced to form a joint company in 1650.

In 1652 the Company obtained from the Mogul, through the influence of a medical gentleman, Mr. Broughton, the grant of a licence for carrying on an unlimited trade throughout the province of Bengal without payment of duties. An increase of capital, an extended charter, and a successful attempt to keep down a new rival company, marked the next ten years. Factories were established at Bantam in 1602, Surat in 1612, Madras in 1639, Bengal in 1652, and Bombay in 1668.

The first occasion on which the Company was brought into collision with any of the native powers of India occurred in 1664, when Sevajee, the founder of the Mahratta States, attacked the city of Surat. The aid which the Company's servants gave on this occasion to the inhabitants won for them the good will of the Mogul; and the Company gradually obtained increased power, both from the Mogul and from Parliament. In 1693 the Company obtained a new charter by gross bribery of the highest officers of state; but the House of Commons refused to sanction it. Another new company was formed about the same time, and another amalgamation took place, which left the United Company on the footing which it maintained from 1702 till 1833. The capital has been gradually increased to 6,000,000*l.*, on which dividends are paid.

The home government of the Company consists of—1, The Court of Proprietors; 2, The Court of Directors; and 3, The Board of Control.

The Court of Proprietors elect the directors of the Company, declare the amount of dividend, and make bye-laws. The votes of the proprietors are given according to the amount of stock which they possess, ranging from 1 vote for 1000*l.*, or upwards. The number of proprietors is about 1900. The Court of Directors consists of 24 proprietors elected out of the general body. The qualification is the possession of 2000*l.* stock. Six of the directors go out of office every year; they retire in rotation, so that the term of office for each is four years. The directors appoint the governor-general of India and the governors of the several presidencies; but as these appointments are all subject to the approval of the crown, they may be said to rest virtually with the government. The directors have the uncontrolled power of recalling any of these functionaries; and in 1844 they exercised this power by recalling Lord Ellenborough, the governor-general. The Board of Control is a government office, established in 1784, the duty of which is to superintend the territorial and political concerns of the Company; to inspect all letters between the directors and their agents which relate to those subjects; to alter or amend the despatches prepared by the directors; and, in urgent cases, to transmit orders to the functionaries in India without the concurrence of the directors.

The act of Queen Anne gave the Company exclusive trading powers to the East, which lasted with little alteration till 1813. In this year much of the trade was thrown open by a new charter for 20 years: that with China being however retained as a monopoly. In 1833 another renewal for 20 years was granted, which took away from the Company the right of trading either to its own territories or the dominions of any native power in India or in China, and threw the whole completely open to the enterprise of individual merchants.

The Company's nominal profits in the 18th century were very high; but as their trade was conducted in a costly way, and was burdened with military charges, it yielded little real profit. Private traders have always been able to outbid the Company, when allowed to compete. Thus, in the twenty years from 1813 to 1833 the value of goods exported by the private trade increased from about 1,000,000*l.* sterling to 3,979,072*l.*, while the Company's trade fell from 826,558*l.* to 149,193*l.* The impossibility, as thus shown, of the Company's entering into competition with private merchants had a powerful influence with parliament; and in the charter of 1833, the Company was confined altogether to the territorial and political management of its vast empire. The dividend guaranteed by the act of 1833 is 630,000*l.*, being 10½ per cent. on a nominal capital of 6,000,000*l.* The dividends are chargeable on the revenues of India, and are redeemable by parliament after 1874.

The following are the names and dates of the Company's acquisitions in the east:—

Date.	Districts.
1757	Twenty-four Pergunnahs.
1759	Masulipatam, &c.
1760	Burdwan, Midnapore, and Chittagong.
1765	Bengal, Bahar, &c.
—	Company's Jaghire, near Madras.
1766	Northern Circars.
1775	Zamindary of Benares.
1776	Island of Salsette.
1778	Nagore.
—	Guntoor Circar.
1786	Pulo Penang.
1792	Malabar, Dundigul, Salem, Barramahal, &c.
1799	Coimbatore, Canara, Wynaad, &c.
—	Tanjore.

1800 Districts acquired by the Nizam in 1792 and 1799 from Sultan of Mysore.
1802 The Carnatic.
— Gorruckpore, Lower Doab, Bareilly.
— Districts in Bundelcund.
1804 Cuttack and Balasore.
— Upper part of Doab, Delhi, &c.
1805 Districts in Gujerat.
1815 Kumaon and part of the Terraie.
1817 Saugur and Huttah Darwar, &c.
— Ahmedabad Farm.
1818 Candeish.
— Ajmeer.
— Poonah, Concan, Southern Mahratta Country, &c.
1820 Lands in Southern Concan.
1822 Districts in Bejapore and Ahmednuggar.
1824 Singapore.
1825 Malacca.
1826 Assam, Aracan, Tarvi, Tenasserim.
1828 Districts on the Nerbudda, Patna, Sumbhulpore, &c.
1832 Cachar.
1834 Coorg, Loudiana, &c.
1835 Jynteeah.
1840 Kurnoul.
1843 Scinde.
1846 Jullindar Doab, &c.

The executive government of the Company's territories is administered at each of the presidencies by a governor and three councillors. The governor of Bengal is also the governor-general of India, and has a control over the governors of the other presidencies. The governors and their councils have each in their district the power of making and enforcing laws, subject in some cases to the concurrence of the supreme court of judicature, and in all cases to the approval of the court of directors and the board of control. Two concurrent systems of judicature exist in India, viz. the Company's courts, and the king's or supreme courts. In the Company's courts there is a mixture of European and native judges. The jurisdiction of the king's courts extends over Europeans generally throughout India.

Previously to the passing of the act of 1833, the Company possessed the power of arbitrary deportation against Europeans without trial or reason assigned, and British-born subjects were not only restricted from purchasing lands, but were prohibited from even renting them. Under this act however the arbitrary powers are materially limited.

Between 1767 and 1813, the Company was liable to an annual payment to the country of about 400,000*l.*, in lieu of their extensive and rather anomalous privileges in the East. This tribute was very irregularly paid; and in 1813 it was abolished altogether; but provisions were at that time laid down, which established the right of Parliament to assume possession of the Company's territories, at some future time. The Company levies a land tax in all its Indian possessions.

The revenue of the Indian government is not confined to its collections from the land, but consists likewise of customs' duties, stamp duties, subsidies, and tribute from certain native states, some local taxes, and the profits arising from the monopolies of salt and opium.

The gross revenue of the Company is about 17,000,000*l.* sterling, and the net revenue is about 15,000,000*l.* Of this sum, about four-fifths are disbursed in India, and the rest in England. In 1844 the ships which sailed to and from the United Kingdom and the Company's ports amounted to—

Inwards, 534 ships (247,087 tons).
Outwards, 540 ships (239,368 tons).

The British and Irish produce and manufactures exported to the Company's territories have been—

In 1841	£5,595,000
1842	5,169,888
1843	6,404,519
1844	7,695,666
1845	6,703,778

The customs' duties in the Company's territories, in 1844, amounted to 1,679,118*l.* *gross*, 1,286,770*l.* net.

EAST INDIES. The portion of the *globe* to which the name of India, or the East Indies, is given, is usually understood to comprehend the peninsula of Hindustan lying to the east of the river Indus, and thence eastward as far as the boundary of the Chinese empire, by which empire, and by Tartary, India is also bounded on the north. The East Indies include also the islands of the Indian Ocean which lie between Hindustan and Australia as far north as the Philippine Islands, and as far east as Papua, but without including either the Philippines or Papua.

EASTER, a moveable feast, held in commemoration of the Resurrection; being the most important and most ancient in observance, it governs the whole of the other moveable feasts throughout the year.

That the observation of Easter is as ancient as the time of the Apostles seems undoubted. In the second century, however, a controversy arose as to the exact time of its celebration. The disputes continued till towards the middle of the fourth century, when the rule for the celebration of Easter was fixed by the Council of Nice, A.D. 325. It was ordered to be held on the Sunday which falls next after the first full moon following the 21st of March, or vernal equinox.

Brand, in his Popular Antiquities, has given a long enumeration of the sports and observances at Easter in former times, including a few superstitions. The mutual presentation of coloured eggs at this season from friends continues both in the East and in Russia.

EASTER. By the act of parliament (24 Geo. II. cap. 23) Easter Sunday is 'the first Sunday after the *full moon* which happens upon or next after the 21st day of March: and if the full moon happens upon a Sunday, Easter Day is the Sunday after.' The act which makes this statement also prescribes rules, that is, copies the rules of the Gregorian calendar, and the tables constructed from them. According to the rules and tables, Sunday, March 23, was Easter Day of 1845. But the full moon was on this very day, at past eight

o'clock in the evening: so that by the explanation Easter Day ought to have fallen on the 30th. The error arises from a mistake and an omission in the act of parliament: Easter was never determined by the day of the 'full moon,' but by the '*fourteenth day* of the moon,' which words ought to have been written instead of 'full moon;' and, moreover, the moon of the calendar is not the moon of the heavens, but an imaginary moon in advance of it. See the articles on the Calendar and on Ancient Almanacs in the 'Companion to the Almanac,' for 1845 and 1846; also the article 'Easter' in the 'Supplement to the Penny Cyclopædia.'

The disputes which agitated the Christians of the 2nd century respecting the observance of Easter depended upon two questions: first, whether the feast was to be a version of the passover, to be kept on the fourteenth day of the moon, or an anniversary of the Resurrection, to be kept on the first day of the week; secondly, in what manner the full moon was to be predicted. It seems clear that towards the end of the second century, the Metonic cycle of nineteen years was frequently introduced into the reckoning.

The Nicene Council (A.D. 325) attempted to bring about a general usage in keeping Easter. All their interference in the matter, as far as it can be collected from the earliest historians of the council, Socrates and Theodoret, is contained in one sentence of the synodical epistle, as follows—'We also send you the good news concerning the unanimous consent of all in reference to the celebration of the most solemn feast of Easter, for this difference also has been made up by the assistance of your prayers; so that all the brethren in the East, who formerly celebrated this festival at the same time as the Jews, will in future conform to the Romans and to us, and to all who have of old observed our manner of celebrating Easter.' The case is clear enough: there was a great schism between the Easterns and Westerns, and the council simply decreed that the former should adopt the usual practice of the latter. St. Ambrose, in the next generation, in a letter written A.D. 386, says that the council had got up the method of the cycle of nineteen years, which they had named *Enneadecaëteris*. That is, Ambrose was not astronomer enough to know that both the thing and the name had been current even in elementary works for hundreds of years before the council.

Shortly after the Nicene Council, there were disputes about the proper cycle for Easter. It is unnecessary here to note the various cycles which were proposed. It was not till the time of Pope Hilarius (A.D. 463) that the cycle of nineteen years obtained a permanent footing. This pontiff employed Victorinus of Aquitaine to correct the calendar, and Victorinus actually constructed the cycle of 532 years, or of 28 Metonic cycles. When Dionysius Exiguus (A.D. 530) altered the mode of reckoning, and abandoned the Diocletian era in favour of what he supposed to be the year of the birth of Christ, he adjusted the mode of reckoning employed by Victorinus accordingly, and the cycle of the latter has ever since been called Dionysian. From his time till that of the Gregorian reformation the rule was strictly observed, no disapprobation producing anything but written arguments. So that the Nicene Council neither succeeded, nor intended to succeed, in doing more than destroying, among the great bulk of Christians, what was called the *quartadeciman* heresy, the opinion that Easter was to be kept on the fourteenth day of the moon. The settlement of the arithmetical or astronomical question is the work of Hilarius and Victorinus.

The assumption of the so-called Dionysian cycle involved two errors. The Julian year being too long by about a day in 130 years, threw the vernal equinox back by a day in that time: while the rule of the cycle supposed that the equinox remained fixed on the 21st of March. Again, the cycle of nineteen years, which supposes 235 lunations to fill up that time exactly, was wrong in a manner which caused the new moons of the calendar to advance a day in every 300 years. The consequence was, that by the time of Pope Gregory XIII., in 1582, the equinox had receded to the 11th of March, while the calendar new moon generally fell on the fourth day following that of the real new moon. These errors were obvious enough to every astronomer. The Council of Trent sanctioned an alteration, and referred the details to the see of Rome. A plan was presented to the pope by the relatives of one Aloysius Lilius, deceased, who had occupied himself with the subject. This plan was approved of, and in 1577 a circular was forwarded to princes and universities throughout the Catholic world, stating the nature of the intended alterations, and inviting suggestions. The Jesuit Clavius was the person, or the principal person, to whom the concoction of the scheme was intrusted. March 1, 1582, a bull was published, dated February 24th, 1581, abolishing the old calendar, giving a general description of the new one, and announcing that it would be fully explained in a forthcoming work. Clavius published this work, namely, 'Romani Calendarii a Gregorio XIII., Pont. Max. restituti Explicatio,' 4to. Rome, 1603; and it was reprinted in the folio collection of his works.

Referring for a full description of the details to the article in the 'Companion to the Almanac,' we shall give a slighter account of the process. Clavius held astronomical considerations to be secondary in importance to the general notions of his predecessors and contemporaries. One of these was, that it was not desirable ever to keep Easter on the same day as the Jews keep the Passover. To avoid this, he uniformly lessens the moon's age by a day, taking care, as much as possible, that all the necessary errors of the imperfect cycle shall have the same effect, namely that of lessening the moon's age, or throwing the new moons forward. Accordingly, his new moons are seldom on the real day, generally one or two days in advance, about as much of one as of the other, and sometimes even three days in advance. *It* is therefore very important to remember that the moon of the calendar is not the moon of the heavens, and not even the mean moon of the astronomers. So that in the act of parliament, instead of the *full moon*

(being the fifteenth or sixteenth day) *of the heavens* (the first day being that of new moon), should have been read the *fourteenth day of the moon of the calendar*. There is evidently a compensating effect: the fourteenth day of a moon, which begins for the most part one or two days after the moon of the heavens, is of course generally the fifteenth or sixteenth day of the moon of the heavens.

Clavius uses the Dionysian cycle in a way which we may describe as follows:—Neglecting the preceding arbitrary alteration, which may be made once for all when everything else is done, there are two things to be provided for. First, the defect of the cycle itself, the error of which is to advance the new and full moons by a day in about 300 years; Clavius took it to be eight days in 2500 years, and accordingly he allowed one day for seven periods of 300 years, and then one day for a period of 400 years. Next, the abandonment of three leap-years in every four centuries, which, though necessary for keeping the equinox at or about one day of one month, would destroy the efficiency of the cycle of nineteen years. There are then two shiftings, as it were, of the cycle necessary—arbitrary alterations of the moon's age at certain periods (we are now speaking only of the calendar moon). We shall now give a set of cycles, from which we shall be able to make the shifts apparent, and to connect them with the above-mentioned necessary corrections. Tables of this form were not given by Clavius himself, but were published in England, we believe, by Lord Macclesfield, at the time of the discussions preceding the alteration of the style in 1752.

In the first column are the days of the month, from March 21 to April 25, and Easter may fall on any one of these days except the first. In the second column are the dominical letters, explained in DOMINICAL LETTER, and which can be found by the table there given. In leap-year, take the second letter of the year in finding Easter. Then follow certain columns, each of which has a heading to show to what years it belongs. Thus the column headed 1700–1899, is to be used between 1700 and 1899, both inclusive, and the column headed O.S. is for the ancient calendar. These columns contain the nineteen golden numbers variously dispersed. Every year has its golden number found thus: add 1 to the year and divide by 19; the remainder, or 19, if there be no remainder, is the golden number.

Take the second of these columns, namely 1583–1699. Opposite to April 8 is written the number 15. This means that, from 1583 to 1699, whenever the golden number is 15, the fourteenth day of the calendar moon is the 8th of April. And so in like manner throughout these columns each golden number is written opposite the day which is the fourteenth of the calendar moon when that golden number occurs. Thus from 2600 to 2899, the fourteenth of the paschal (calendar) moon is always on the 2nd of April whenever the golden number is 16.

At the bottom of the columns it will be seen that there are in one or two places numbers which do not rise or fall with the rest. This was a sacrifice of uniformity to the desire of preserving

		O. S.	1583–1699.	1700–1899.	1900–2199.	2200–2299.	2300–2399.	2400–2499.	2500–2599.	2600–2899.
March 21	C	16	3	14	—	6	17	6	17	—
22	D	5	—	3	14	—	6	—	6	17
23	E	—	11	—	3	14	—	14	—	6
24	F	13	—	11	—	3	14	3	14	—
25	G	2	19	—	11	—	3	—	3	14
26	A	—	8	19	—	11	—	11	—	3
27	B	10	—	8	19	—	11	—	11	—
28	C	—	16	—	8	19	—	19	—	11
29	D	18	5	16	—	8	19	8	19	—
30	E	7	—	5	16	—	8	—	8	19
31	F	—	13	—	5	16	—	16	—	8
April 1	G	15	2	13	—	5	16	5	16	—
2	A	4	—	2	13	—	5	—	5	16
3	B	—	10	—	2	13	—	13	—	5
4	C	12	—	10	—	2	13	2	13	—
5	D	1	18	—	10	—	2	—	2	13
6	E	—	7	18	—	10	—	10	—	2
7	F	9	—	7	18	—	10	—	10	—
8	G	—	15	—	7	18	—	18	—	10
9	A	17	4	15	—	7	18	7	18	—
10	B	6	—	4	15	—	7	—	7	18
11	C	—	12	—	4	15	—	15	—	7
12	D	14	1	12	—	4	15	4	15	—
13	E	3	—	1	12	—	4	—	4	15
14	F	—	9	—	1	12	—	12	—	4
15	G	11	—	9	—	1	12	1	12	—
16	A	—	17	—	9	—	1	—	1	12
17	B	19	6	17	17	9	—	9	—	1
18	C	8	14	6	6	17	9	17	9	9
19	D	—	—	—	—	—	—	—	—	—
20	E	—	—	—	—	—	—	—	—	—
21	F	—	—	—	—	—	—	—	—	—
22	G	—	—	—	—	—	—	—	—	—
23	A	—	—	—	—	—	—	—	—	—
24	B	—	—	—	—	—	—	—	—	—
25	C	—	—	—	—	—	—	—	—	—

one characteristic of the old calendar, namely, that the fourteenth of the calendar moon never fell on the same day of the same month at any two epochs which were within nineteen years of each other. This would have happened sometimes, owing to the corrections above described; and Clavius took a very simple method of avoiding it, which is explained in the article already cited. The effect of his method is to produce the slight departure from uniformity of alteration above noted.

To find Easter by the preceding table, first find the golden number, and then the dominical letter. [DOMINICAL LETTER]. Take the proper column, and find out the day opposite to which the golden number stands. Go on from that day to the next following day which has the dominical letter opposite to it; that day is Easter Sunday. For example, take 1847. Add one, and divide by 19; the remainder is 5, the golden number. The dominical letter found as in the article cited is C. In the column 1700–1899, we find 5 opposite to March 30, which is the fourteenth of the calendar moon. The next C is opposite April 4, which is Easter Sunday.

EASTER-DUES. [OFFERINGS.]

EASTER ISLAND, a small island in the eastern part of the Pacific Ocean, is situated between 75° 5′ and 75° 12′ S. lat., and between 109° and 110° W. long. It is of volcanic origin, and has a stony and hilly surface, and an iron-bound coast. The island has no safe anchorage, no fresh water, and no domestic animals, except a few fowls. The inhabitants live on yams, potatoes, and sugar-cane. The population is said to be between 1200 and 2000. (Cook, La Perouse, and Beechey.)

EASTERN EMPIRE. [ROMAN EMPIRE.]

EA'USE. [GERS.]

EBEL, JOHANN GOTTFRIED, a writer on statistics and geology, born at Francfort on the Oder, Oct. 6, 1764; died at Zürich, 1830. The most popular of his works is his 'Guide to Travellers in Switzerland.' His work on the geology of the Alps touches also on the structure of the globe in general, and contains valuable information on the geognostical relations of the Alps.

EBELING, CHRISTOPHER DANIEL, born 1741, at Garmissen in Hildesheim; died in 1817. He studied theology at Göttingen, and acquired great knowledge of the oriental languages, especially the Arabic, and was thoroughly acquainted not only with the classical literature of Greece and Rome, but also with that of modern Europe, particularly England. His chief work is his 'Geography and History of the United States of North America,' 7 vols. 8vo. That part of his library which related to America, consisting of 3900 volumes, was purchased after his death by M. Israel Thoredino, a friend of learning, at Boston, and presented to Harvard college. Ebeling was for thirty years professor of history and of the Greek language in the gymnasium at Hamburg. His industry was untiring, and his disposition friendly and cheerful.

EBENA'CEÆ, a natural order of monopetalous exogens. The species consist entirely of bushes or trees, some of which are of large size; their leaves are alternate, with no stipules, and generally leathery and shining. *Diospyrus ebenus* and some others yield the valuable timber called ebony. The fruit of *Diospyrus Kaki* is about as large as an apricot, and is dried as a sweetmeat by the Chinese. Most plants of this order are tropical.

EBERSBACH. [LAUSITZ.]

EBIONITES, a sect of Christian Jews, which existed in Palestine and other parts of the East in the first and second centuries of our æra. Origen, Epiphanius, Eusebius, and other early fathers, distinguish two sorts of Ebionites, namely, those who denied the divinity of Jesus Christ, asserting that he was the son of Joseph and Mary, though endowed with a prophetic gift, and those who maintained that he was born of a virgin, but denied his pre-existence as God. (Mosheim, *Institutes of Eccles. History*, with *Notes* by Dr. Murdoch; Neander, *Kirchengeschichte*.)

EBONY is well known as a hard black-coloured wood, brought from the hot parts of the world. The Greek name is ébenos (ἔβενος), from which the Latin *ébenus*, and our word ebony have been immediately derived. From its hardness, durability, susceptibility of a fine polish, and colour, which has almost become another name for blackness, ebony has always been in high estimation, and in the present day is much used for mosaic work and ornamental inlayings, though cheaper woods dyed black are frequently substituted. Several trees yield this kind of wood, and all belong to the genus *Diospyrus*. All the species of *Diospyrus* form large trees, with alternate, thick, and often coriaceous leaves. The species are found chiefly in the tropical parts both of Asia and America, as in the Malayan archipelago and peninsula, and in almost every part of India. One species extends southwards to New Holland; one, *D. lotus*, to Switzerland, and *D. Virginiana* into the United States of America.

Diospyrus ebenus, the true ebony, and that which is considered to be of the best quality, is a large tree, a native of the Mauritius, Ceylon, and Madagascar. The leaves are very smooth, short, petioled, alternate, bifarious, oblong in shape, the buds very hairy; male flowers sub-racemed, with about twenty anthers, the hermaphrodite solitary, octandrous. Large quantities of the ebony of this species have been sometimes imported into Europe. *D. ebenaster* is also a tree of considerable magnitude, a native of Ceylon, of which the leaves are coriaceous and smooth on both sides, and the buds smooth. *D. reticulata* is another elevated tree, a native of the Mauritius, of which the heart-wood forms ebony. *D. melanoxylon* is the ebony tree of the Coromandel coast. It is found on the mountains of that coast as well as of Malabar, and in Ceylon.

Several species of the genus bear fruit, which, though clammy and subastringent, is eaten by the natives of the countries where the trees are indigenous. *D. lotus* bears a sweet yellow fruit, about the size of a cherry. *D. Virginiana*, the Persimmon Tree, is indigenous in North America, especially in the middle and southern of the United States, where it attains a height of sixty feet, but it does not flourish beyond 42° of N. latitude. The fruit while green is very astringent, but when ripe it is sweet and palatable.

EBRO, the ancient *Ibérus*, a river of Spain, rises near Reynosa in Old Castile, at the foot of the Asturian mountains, and flowing in a general south-east direction, crosses the north part of the province of Burgos, marks the boundary between Alava and part of Navarra on its left bank, and Burgos and Soria on its right, passing Miranda and Logroño, and then enters Navarra, dividing the districts of Tudela and Cascante from the rest of that province. It then enters Aragon, which it divides into two nearly equal parts, flows past Zaragoza and Mequinenza, and below the latter town enters Cataluña, where it assumes a S.S.E. direction, and passes by Tortosa, below which it enters the sea by two branches, the southernmost of which forms the port of Alfaques, after a course of rather more than 400 miles. The Ebro begins to be navigable for boats at Tudela, but the navigation is often impeded by rapids and shoals. To avoid these a canal has been constructed, which begins near Tudela, and running along the right bank of the river, rejoins it 6 miles below Zaragoza. It was intended to carry it as far as Tor-

tosa. The Ebro receives numerous affluents, the principal of which are the Aragon, which rises in the mountains of Navarra and enters the Ebro near Milagro; the Gallego, which flows from the mountains of Jaca in Aragon, enters the Ebro nearly opposite Zaragoza; the Segre [CATALUNA]; the Jalon, which rises E. of Siguenza in the province of Soria, and joined by the Jiloca (which springs from the Sierra de Albarracin), enters the Ebro a few miles N.W. of Zaragoza; and the Guadalupe, which enters the Ebro above Mequinenza. [ARAGON; CASTILLA LA VIEJA.]

EBULLITION. [BOILING OF FLUIDS.]

ECBA'TANA (Ἐκβάτανα), or Agbatana, the ancient capital of Media, founded by Déioces (Herod. i. 98). It appears in the 'Itinerary' of Isidore of Charax under the form of Apobâtana. There was a city of the same name in Syria, of uncertain position (Herod. iii. 64), where Cambyses died. [CAMBYSES.]

Ecbatana was situated in a plain at the foot of a lofty mountain called Orontes. Being in a high and mountainous country, it was a favourite residence of the Persian kings during summer.

Hamadan, which is on or near the site of Ecbatana, is near the parallel of 35° N. lat., and in 48° E. long., in a plain at the foot of Mount Elwund. Elwund belongs to that mountain-chain which forms the last step in the ascent from the lowlands of Irak Arabi to the high table-land of Iran. 'During eight months in the year the climate of Hamadan is delightful: but in winter the cold is excessive, and fuel with difficulty procured. The plain is intersected by innumerable little streams, covered with gardens and villages, and the vegetation is the most luxurious I ever beheld.' (Kinneir's 'Persia,' p. 126.) Kinneir says that the summit of Elwund is tipped with continual snow, and seldom obscured by clouds. Hamadan has a large manufacture of leather, and also a considerable trade, owing to its position on the high road from Bagdad to Tehran and Ispahan. According to Kinneir, it has about 10,000 inhabitants.

For further references as to the history of Ecbatana, see the fourth number of the 'Journal of Education;' Bähr's 'Ctesias,' p. 88; the note on Q. Curtius, v. c. 8, ed. Pitiscus, 1708; and Wesseling's note on Herod. i. 98.

ECCLESIASTES, or THE PREACHER, a canonical book of the Old Testament, placed after the Proverbs, and before the Song of Solomon. The English title is taken from the Septuagint, and means one who calls together or calls out to an assembly—a public declaimer. The general supposition that Ecclesiastes was written by Solomon is apparently warranted by the passages i., 1, 12, 16; ii. 4–9, which designate the author as the son of David, king of Israel, and the greatest possessor of wealth and wisdom in Jerusalem. Various opinions have been entertained concerning the design and scope of this book, but the best supported seems to be that of its inquiry as to the chief good, which is resolved by the author in its being the possession of pure wisdom, which, in the writings of Solomon, is but another name for the true religion.

ECCLESIASTICAL COMMISSIONERS, were a body appointed in 1835 to examine into the temporal affairs of the church of England. They made five reports, recommending alterations in the number of bishoprics, and the appropriation of part of the revenues of chapters and collegiate bodies to parochial purposes. Some of their recommendations have been adopted. [BISHOPRIC.] There are also Ecclesiastical Commissioners in Ireland who receive and apply the incomes of the suppressed bishoprics in that kingdom under the act of 3 & 4 Wm. IV., cap. 37.

ECCLESIASTICAL COURTS are courts in which the canon law is administered [CANON LAW], and causes ecclesiastical determined. Coke, in treating of the distinction between temporal and spiritual causes, says:—'And as in temporal causes, the king by the mouth of his judges in the courts of justice, doth judge and determine the same by his temporal laws of England, so, in causes ecclesiastical and spiritual, as, namely, blasphemy, apostacy from Christianity, heresies, schisms, ordering admissions, institutions of clerks, celebration of divine service, rights of matrimony, divorces, general bastardy, subtraction and right of tithes, oblations, obventions, dilapidations, reparation of churches, probate of testaments, administration and accounts upon the same, simony, incests, fornications, adulteries, solicitation of chastity, pensions, procurations, appeals in ecclesiastical causes, commutation of penance and others (the cognizance whereof belongeth not to the common laws of England), the same are to be decided and judged by ecclesiastical judges according to the king's ecclesiastical laws of this realm.'

In July, 1830, a Commission was appointed to inquire into the Practice and Jurisdiction of the Ecclesiastical Courts in England and Wales. The Report of the Commissioners, which was presented in 1831, was signed by the archbishop of Canterbury and others. This report explains—1, The nature of the ecclesiastical courts; 2, the course of proceeding in *ecclesiastical suits*; and 3, the nature of the processes, practice, and pleadings of the ecclesiastical courts.

The ordinary ecclesiastical courts are—1, The *Provincial Courts*, being, in the province of Canterbury, the Court of Arches, or Supreme Court of Appeal, the Prerogative or Testamentary Court, and the Court of Peculiars; and in the province of York, the Prerogative or Testamentary Court, and the Chancery Court; 2, The *Diocesan Courts*, being the consistorial court of each diocese, exercising general jurisdiction; the court or courts of one or more commissaries appointed by the bishop, in certain dioceses, to exercise general jurisdiction, within prescribed limits; and the court or courts of one or more archdeacons or their officials, who exercise general or limited jurisdiction, according to the terms of their patents, or to local custom. 3. There are also *Peculiars* of various descriptions in most dioceses, and in some they are very numerous: royal, archiepiscopal, episcopal, decanal, sub-decanal, prebendal, rectorial, and vicarial; and there are also some manorial courts, which exercise testamentary jurisdiction.

The Provincial Courts of the archbishop of

Canterbury and the archbishop of York are independent of each other. The appeal from each of the provincial courts lies to the Judicial Committee of Privy Council (2 & 3 Wm. IV. c. 92.)

The Arches Court of Canterbury has appellate jurisdiction from each of the diocesan and most of the peculiar courts within the province. It may also take original cognizance of causes by letters of request, from each of those courts.

The Prerogative Court has jurisdiction of all wills and administrations of personal property left by persons having *bona notabilia*, or effects of a certain value, in divers ecclesiastical jurisdictions within the province. Its authority is necessary to the administration of the effects of all persons dying possessed of personal property to the specified amount within the province, whether leaving a will or dying intestate.

The Court of Peculiars takes cognizance of all matters arising in certain deaneries.

The province of Canterbury includes twenty-one dioceses, and therein the diocese of Canterbury itself, where the ordinary episcopal jurisdiction is exercised by a commissary, in the same manner as in other dioceses. The province of York includes five dioceses, besides that of Sodor and Man, and the archiepiscopal jurisdiction is exercised therein much in the same manner as in the province of Canterbury.

The Diocesan Courts take cognizance of all matters arising within their respective limits, with the exception of places subject to peculiar jurisdiction. They may decide all matter of spiritual discipline; they may suspend or deprive clergymen, declare marriages void, pronounce sentence of separation à mensâ et thoro, and administer the other branches of ecclesiastical law.

The Archdeacon's Court is generally subordinate, with an appeal to the Bishop's Court; though in some instances it is independent and co-ordinate.

The Archdeacons' Courts, and the various Peculiars already enumerated, in some instances take cognizance of all ecclesiastical matters arising within their own limits, though the jusisdiction of many of the peculiar courts extends only to a single parish. The authority of some of them is limited to a part only of the matters that are usually the subject of ecclesiastical cognizance. Several of the peculiars possess voluntary but not contentious jurisdiction.

The total number of courts which exercise any species of ecclesiastical jurisdiction in England and Wales is 372, of which 87 are provincial and diocesan courts of bishops' commissaries and archidiaconal courts; and the rest are peculiars.

In 1843 the gross fees, salaries, and emoluments of the judges, deputy-judges, registrars, deputy-registrars, and all other officers in the eccesiastical courts of England, Wales, and Ireland, amounted to 120,513*l.*, of which sum 101,171*l.* was the proportion for England.

The ecclesiastical jurisdiction comprehends causes of a civil and temporal nature; some partaking both of a spiritual and civil character; and, lastly some purely spiritual.

In the first class are testamentary causes, and matrimonial causes for separation and for nullity of marriage. The second class comprises causes of a mixed description, as suits for tithes, church-rates, seats, and faculties. As to tithes, however, the courts of common law can restrain the ecclesiastical courts from trying any cases of modus or prescription, if either of the parties apply for a prohibition. The third class includes church discipline, and the correction of offences of a spiritual kind. Among these are offences committed by the clergy themselves, such as neglect of duty, immoral conduct, advancing doctrines not conformable to the Articles of the church, suffering dilapidations, and the like offences; also by laymen, such as brawling, laying violent hands on any person, and other irreverent conduct in the church or churchyards, violating churchyards, neglecting to repair ecclesiastical buildings, incest, incontinence, defamation. These offences were punished by monition, penance, and excommunication formerly, but now in place of it imprisonment for a term not exceeding six months, suspension from entering the church, suspension from office, and deprivation.

As to the judges of the ecclesiastical courts, advocates, and proctors, see ARCHES, COURT OF; DOCTORS' COMMONS; and PROCTOR.

ECCLESIA'STICUS, or THE WISDOM OF JESUS, THE SON OF SIRAC, an apocryphal book of the Old Testament. It is stated to have been originally written in Syro-Chaldaic, by Jesus, the son of Sirac, a learned Jew, who travelled in pursuit of knowledge 130 years B.C. It was translated into Greek for the use of the Jews of Alexandria, by the grandson of the author, or rather compiler, for it is evidently a collection of fragments, written at different times and on various occasions, consisting of meditations and proverbs relating to religion, morals, and the general conduct of human life. These meditations display much acuteness of thought, with propriety of diction, and occasionally poetical eloquence. They closely resemble the numerous other oriental proverbs, and especially the collection attributed to Solomon. In the western Christian church this book was highly esteemed. The council of Carthage made it canonical, as the fifth book of Solomon, and the council of Trent confirmed the decision. It was also introduced by the early Protestant reformers into the liturgy of the church of England.

ECCREMOCARPUS SCABER, a climbing Chilian half-shrubby plant belonging to the natural order *Bignoniaceæ*, inhabiting thickets and hedges in its native country, and scrambling among the branches of bushes and small trees. It is a handsome half-shrubby plant, which will live in the open air in the milder parts of England. By some it is called *Calampelis scabra*.

ECCULIO'MPHALUS, a genus of fossil Gasteropoda, from the mountain limestone chiefly. (Portlock.)

ECHARD, LAWRENCE. It is unknown when this author was born; but his translation of the 'Amphitryo' of Plautus was published in 1694. He was educated at Cambridge, and took orders. In 1712 he became archdeacon of Stowe and prebendary of Lincoln. His historical works have long ceased to be read; but his translation

of Terence is still frequently purchased by indolent schoolboys, who could not well buy a more unprofitable book.

ECHIDNA (Cuvier), *Tachyglossus* (Illiger), a genus of *Monotremes* (*Monotremata*), which constitute a section placed by Cuvier under the order *Edentata*. By subsequent zoologists the *Monotremata* have been formed into an order or primary group of the implacental subclass of mammalia—the *Marsupilia* of Waterhouse and others.—(See article *Monotremata* in 'Cyclopædia of Anatomy and Physiology' and 'Natural History of Mammalia' by G. R. Waterhouse). In the genus *Echidna*, the following characters are presented: *Muzzle* elongated, slender, terminated by a small mouth, furnished with an extensible tongue similar to that of the *Anteaters* and *Pangolins*. *No teeth*, but the *palate* furnished with horny papillæ. —*Feet* short, very robust, and formed for digging, each armed with five strong claws; *hind feet* in the *male* furnished with a horny spur.—*Tail* very short.—*Body* protected above with stout spines intermixed with hair.—*Eyes* small and black.—*Orifice* of the ears of a sigmoid form. Naturalists describe two species of the *Echidna*, viz. *E. aculeata*, and *E. setosa*—but these are probably only local varieties of the same species. The former inhabits New South Wales, the district of the Swan River, &c.; the latter Van Diemen's Land.

The *Echidna* is about the size of a hedgehog, and not unlike that animal in general appearance, except that the dorsal spines are thicker and longer, the limbs far more robust, and the snout elongated and beak-like. This animal is formed for burrowing, and excavates the ground with great facility. It appears to be nocturnal in its habits, and like the hedgehog is capable of rolling itself up, so as to present a panoply of spines against its enemies. Its food consists of ants and probably of other small insects, which it captures, as do the Anteaters, by means of its long slender protractile tongue. For some account of a specimen captured by Lieutenant Breton, on the Blue Mountains, and which died during its passage to England, when the vessel was off Cape Horn, see 'Proc. Zool. Soc.' 1834, Pt. 2. In the spring of the year 1845, a living specimen of the *Echidna* was exhited in the gardens of the Zoological Society. It was dull and sluggish, reposing half curled up during the greater part of the day. At times however it roused from its state of apathy and explored the cage, thrusting its snout through the bars in the hopes of finding some outlet of escape. It fed on bread and milk, but refused mealworms. When irritated it curled itself up, and assumed the same position during sleep. It never attempted to use its spurs on the defensive. Its mode of taking its food was by a rapid protrusion and retraction of its long tongue.

Synonyms:—*Myrmecophaga aculeata*, Shaw; *Ornithorhynchus aculeatus*, Home. Hedgehog of the Colonists at Sidney.

ECHI'NIDÆ, a family of *Echinodermata*, or radiated animals, comprehending those marine animals popularly known by the name of Sea-Eggs, or Sea-Urchins (*oursins* of the French.)

De Blainville makes the *Echinidea* the second order of the class *Echinodermata*, and he thus defines the order:—

Body.—Oval or circular, regular, sustained by a solid shell, which is calcareous, and composed of polygonal plates, disposed in radiated order in twenty rows, which are either equal, or alternately and regularly unequal. The shell supports upon proportionable mamillary projections stiff spines, which are extremely variable in form, and is pierced by series of pores, forming by their assemblage a kind of ambulacra. It radiates more or less regularly from the summit to the base, and gives exit to tentaculiform cirrhi.

Mouth.—Armed or unarmed, pierced in a notch of the shell, invariably on the lower side.

Vent.—Always distinct, but offering many variations in its position.

Generative Orifices.—Four or five in number, disposed round the dorsal summit.

Anatomy, Reproduction, &c.—Not completely known, notwithstanding the labours of Réaumur, Klein, Cuvier, Lamarck, De Blainville, Gray, Delle Chiaje, Tiedemann, and Dr. Sharpey, to whose works we must refer the reader. We shall only here observe, that the whole of the *Echinidæ* are probably hermaphrodites, and that consequently reproduction is carried on without the aid of a second individual; but this is uncertain. On the European coasts the *Echinidæ* are observed with their ovaries in a turgescent state in the spring, and we may thence conclude that the time of ovipositing is the summer. The places of deposit are most probably the fissures or cavities of rocks and aggregations of fucus, and the deposit itself is made in one mass. Nothing certain appears to be known as to the development of the eggs, the duration of that development, or of the length of the life of the animal.

Geographical Distribution.—In almost all seas, but more especially in those of warm climates, on rocky or sandy coasts, often free, sometimes sunk in the sand. The species are very numerous.

Habits.—All the *Echinidæ* are locomotive, though their locomotion, which is effected principally by means of their contractile tubular feet, and in a degree by their spines, is rather laborious. Some of the species, which repose on rocks, have a power of eroding the stone so as to make a nidus for themselves, which is generally not deep.

Food.—Animal, probably, and molecular in the edentulous species. Those whose mouth is armed with teeth are supposed to live on marine plants. Cavolini, at least, says as much of the Sea-Eggs (*oursins*), properly so called.

Utility to Man.—When the ovaries of some of the species are fully developed (*Echinus edulis*, for instance), they are collected as an article of food.

Fossil Echinidæ.—There are few animal remains, with the exception of the shells of the testaceous mollusks, better preserved than those of the *Echinidæ*. They occur in a fossil state in almost incredible numbers, and are to be traced through all the formations, from the epoch of the transition series to the present time. Dr. Buckland remarks that he found, many years ago, fossil Echinidans in the carboniferous limestone of Ireland,

near Donegal, and that they are rare in the transition formation, become more frequent in the muschelkalk and lias, and abound throughout the oolitic and cretaceous formations.' ('Bridgewater Treatise.')

Their abundance may be, in some degree, accounted for by the habits of a great proportion of them, which lead them to bury themselves in the sand, &c., so that their preservation must for the most part be complete. The nature also of the shell, and its structure, are other causes of fossil durability, for it is almost spathose in parts, while the animal is yet alive. The peculiar fracture presented by the shell and spines is relied on by De Blainville as indicating the place of the *Echinidæ* in the natural series to be with the *Encrinites*, and not with those *Zoophytaria* which are near the *Pennatulæ*.

Systematic Distribution.—Breyn, Klein, Linnæus, Leske, Lamarck, Cuvier, Gray, Desmarest, Goldfuss, Von Buch, Agassiz, are the principal zoologists who have classed the *Echinidæ*. De Blainville observes that the relative position of the mouth and the vent, and, above all, of the ambulacra, are the principal points on which most of these writers have rested; and as he considers that this mode of viewing the subject has led to approximations not very natural, he proposes a system based on the following grounds:—

1st. On the general form of the body of the animal, which, at first subradiated, becomes, by little and little, completely radiated in all the parts which constitute it.

2nd. Upon the position of the mouth, which, nearly terminal and transverse, or bilabiated, in the first species, becomes completely central and circular in the last.

3rd. On the arming of this mouth, which, completely null in a great proportion of the *Echinidæ*, is, on the contrary, very powerful in the rest.

4th. Finally, on the position of the vent, on the number of ovaries and their orifices, on the nature of the spines and the tubercles which support them, as well as on the disposition of the ambulacra.

Synoptical Table of the Genera, according to De Blainville.

- Mouth
  - Subterminal.
    - Spatangus
    - Ananchites
  - Subcentral.
    - Without Teeth.
      - Nucleolites
      - Echinoclypeus.
      - Echinolampas.
      - Cassidula.
      - Fibularia.
      - Echinoneus.
    - Armed with teeth.
      - Echinocyamus.
      - Laganus.
      - Clypeaster.
      - Echinodiscus.
      - Scutella.
  - Central; Vent.
    - Infra-lateral
      - Galerites.
    - Central
      - Echinometra.
      - Echinus.
      - Cidaris.

ECHINOCACTUS, a genus of cactaceous plants, with the stem of an ovate or spheroidal form, the sides being divided into many ribs, upon whose projecting angles are stationed at short intervals little spiny stars, which are the rudiments of leaves, and from whose centre the flowers appear. The latter consist of numerous sepals collected into a tube, an equally large number of petals, numerous stamens, and a filiform style divided into many lobes at the point. The species are very remarkable for the singular forms of their stems, and for the curious manner in which their spines are arranged. They are often moreover conspicuous for the beauty of their large flowers. Most of the species are natives of Mexico and the West Indies. A few are found in Brazil.

ECHINO'CHLOA (from ἐχῖνος, a hedgehog, and χλόη, grass), a genus of grasses belonging to the tribe *Paniceæ*. The species are coarse grasses, of which only one, the *E. crus-galli*, grows in Great Britain. It is a strong coarse grass, bearing any climate better than most other plants, and is found in the vicinity of London.

ECHINODE'RMATA. Lamarck made his *Radiaires Echinodermes* consist of three sections. 1st, the *Stellirideans* (star-fishes), including *Comatula, Euryale, Ophiura*, and *Asterias;* 2nd, the *Echinidæ;* and 3rd, the *Fistulidæ*, comprehending *Actinia, Holothuria, Fistularia, Priapulus*, and *Sipunculus*.

Cuvier's *Echinodermes* form his first class of zoophytes, and this class is divided into two orders, viz., 1st, the *Pedicillated Echinoderms*, containing the great genus *Asterias* and its subgenera the *Encrinites*, the *Echinidæ*, and *Holothuria;* and 2nd, the *Footless Echinoderms*, consisting of *Molpadia, Minyas, Priapulus*, the *Lithoderms, Sipunculus, Bonellia*, and *Thalassema*, with its subgenera *Echiurus* and *Sternaspis*.

De Blainville's *Echinodermata* are placed as his first class of *Actinozoa*, and are divided into three orders; 1st, *Holothuridea;* 2nd, *Echinidea* [ECHINIDÆ]; 3rd, *Stelleridea*, embracing the *Encrinites* as well as the *Free Star-Fishes*, &c.

The *Echinodermata* belong to the Cycloneurose sub-kingdom.

ECHINOLA'MPAS, a genus of fossil Echinida, from the oolitic and chalk strata. (Gray.)

ECHINO'PHORA (from ἐχῖνος, a hedgehog, and φορέω, in composition signifying 'bearing'), a genus of plants belonging to the natural order *Umbelliferæ*, and to the tribe *Smyrneæ*. The *E. spinosa*, or Sea-Parsnip, has been admitted into the British Flora, but it must be considered a doubtful native. It has been found in Lancashire and Kent. It is mostly an inhabitant of sandy sea-shores, and has pinnate spinose leaves, and resembles in habit and external character the *Eryngium*. Three other species are described. When cultivated they require a warm situation and a dry soil. They must be propagated by cuttings of the roots or stems.

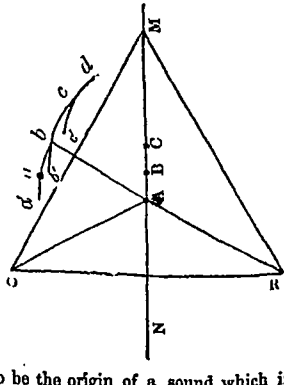
ECHINO'STACHYS, a genus of fossil plants, from the Bunter sandstein. (Brongniart.)

ECHI'TES, a genus of twining Apocynaceous

plants inhabiting tropical countries. They have handsome yellow or white corollas, and are moreover remarkable for the singular fruit, which consists of two divaricating woody pod-like follicles containing a large number of silky seeds. They are dangerous lactescent plants of no known use.

E'CHIUM (from ἔχις, a viper), a genus of plants belonging to the natural order *Boraginaceæ*. The species are rough, shrubby, or herbaceous plants, with lanceolate or oblong-lanceolate leaves, and blue or white flowers. *E. vulgare*, Viper's Bugloss, is a native of dry places in Great Britain and throughout Europe. It is a remarkably handsome plant. The flowers are at first reddish and afterwards become blue. Above eighty species of this genus have been described; they inhabit the temperate parts of all quarters of the globe, but are more especially European. A large number of the shrubby species are natives of the Canary Islands, and another entirely different group are inhabitants of the Cape of Good Hope. The great bulk of the European species are herbaceous, as well as those which inhabit South and North America. All the species are worthy of cultivation, and the European species are amongst the handsomest of the indigenous plants of Europe. The shrubby species are all greenhouse plants, and will grow in a mixture of sand, loam, and peat; and cuttings will strike under a hand-glass in this mixture. They may be also propagated by layering and by seeds, which sometimes come to perfection in this country.

ECHO. (ἠχώ, ἦχος, *sound*). When sonorous undulations are propagated from any origin through the elastic medium of the air, the spherical wave-like surface then generated conveys the sound through the circumjacent space, and moves from its origin and centre with a velocity of about 1125 feet in a second, at the ordinary atmospheric pressure and temperature. Now, suppose the



point O to be the origin of a sound which in its progress encounters a plane obstacle NM; if this plane be sufficiently extended, a point M may be easily found which the sound will have just reached at the end of a given time. The waves which have previously reached the nearer points A,B,C, being precluded from advancing, are there reflected, that is, new spherical undulations *a'ab*, *b'bc*, *c'cd* are generated from A,B,C as centres, and their radii at the moment we have spoken of are respectively $Ab = OM - OA$, $Bc = OM - OB$, $Cd = OM - OC$, and it is easily seen that all these spherical surfaces originating from A up to M and existing simultaneously, may be exactly enveloped by a single portion of a spherical surface of which the centre is placed in a position R corresponding to O in respect to its distance from NM, but at the opposite side of the obstacle; this spherical surface, of which the radius is RM, is the true returning wave at that moment, and being impressed on the auditory organs, so as to be distinguished from the original sound, is called the echo.

When a sound originates at any point and is reflected by a plane obstacle, the reflected pulsation of air occupies a conic frustum, the vertex of the cone being beyond the plane in the direction of a line let fall from the point perpendicularly to the plane produced. In order that a person may hear the echo of his own sounds, it is therefore necessary that he should be before the plane in the direction of a line drawn perpendicular to it; and, that a second person may hear the echo of the voice of another, the parties must be so situated that the angles of incidence and reflexion made by lines drawn from them to the plane may be equal to one another.

Hence it follows that wherever a person is situated, the echo of a single sound necessarily follows the original sound; for the two sides along which the reflected sound is transmitted are greater than the third side in which (of the triangle) the direct sound is propagated; the velocities in both cases being alike.

However, the echo of a continued sound or note may be heard in the inverse order of time to that in which it was generated, provided the origin of the sound moves more rapidly towards the hearer than the rate at which sound travels. Thus a flash of lightning moving towards a person will produce a roll of thunder which, echoed by clouds, will be heard as it were backwards; but if the direction of the flash be such that the points of its current are nearly equidistant from the auditor, an instantaneous and intensely loud clap will be substituted for a continued roll.

The murmuring sound produced by the discharge of great guns is the succession of echoes from the particles of vapour floating in the atmosphere, and when the discharge is effected under a dense cloud, the echoes are stronger and better reflected, and a noise resembling a thunder-roll may then be heard. The whizzing of a bullet is attributed to its impinging in a state of rapid rotation on particles of vapour.

When the succession of echoes from several bodies is sufficiently rapid, a continued sound or note may be produced, though the original sound was merely momentary; and when not sufficiently rapid for this purpose, a clamorous noise is produced. But when, as in the case of the electric fluid, the original cause of sound may be said to exist simultaneously through an extensive tract of an excited atmosphere, a sound perfectly continuous and majestic is produced in the thunder-roll,

which may frequently be heard again echoed by neighbouring clouds, or awfully prolonged by repeated reflections from an amphitheatre of mountains.

The distribution of sound in public edifices, so that the echoes may be most advantageously brought to strengthen the original sound, is a subject practically deserving of much attention. For some sensible observations on the errors of architects in this respect, we must refer to Sir J. Herschel's treatise on 'Sound.'

When the reflecting surfaces, instead of plane, are curved, as in caverns, grottos, rocks, or ruined buildings, the reflected sound will be most intense at the foci, or the points which would be most enlightened *by reflection* if a luminous body were substituted in the place of the original source of sound.

E'CIJA, or EZIJA, the ancient *Astigi*, a town of Andalucia, in the province of Sevilla, stands on the Genil, a feeder of the Guadalquivir, in a fine plain, about 55 miles N.E. from the city of Sevilla, and has 34,000 inhabitants. The town has many churches and convents, several hospitals, and other public buildings, and a very fine promenade along the banks of the Genil, the ancient Singulis, which is adorned with fountains and statues. The territory is rich in corn and olives; there are also some manufactories of woollens and linens. There is a fine bridge over the Genil. Several Roman and other remains are found here. (Miñano.)

ECKHEL, JOSEPH HILARY, was born at Entzersfeld, in Austria, January 13, 1737. His father sent him at a very early age to the Jesuits' College at Vienna, where, in 1751, he was enrolled in their society. He studied philosophy, mathematics, divinity, and the learned languages; but devoted himself chiefly to antiquities and medals. In 1772 he went to Italy, where the grand duke of Tuscany, Leopold II., engaged him to arrange his collection of medals; and on his return to Vienna, in 1774, he was appointed director of the Imperial Cabinet of Medals, and professor of antiquities. Eckhel is the author of numerous valuable works on ancient coins and medals. In 1792 appeared the first volume of his 'Doctrina Numorum Veterum,' Vienna, 4to.; the eighth and last volume of which was published in 1798. A supplement to it, with his portrait prefixed, has since appeared, 'Addenda ad Eckhelii Doctrinam Numorum Veterum ex ejusdem Autographo postumo,' 4to., Vindob., 1826. He died, May 16th, 1798, at the house of his friend the Baron de Locella.

ECKMÜHL, a village in the Bavarian circle of the Regen, famous for the victory gained by the French under the emperor Napoleon over the Austrians, under the Arch Duke Charles, on the 22nd April, 1809. Marshal Davoust was created prince of Eckmühl for his skill and bravery in this battle. [BONAPARTE.]

ECLECTICS, the name given to those philosophers who, without adopting any particular system or dogmatizing for themselves, professed to select (ἐκλέγειν) from other philosophical systems whatever they conceived most comformable to truth, and fitted those detached parts together so as to form a new whole.

ECLIPSE (*ecleipsis*, ἔκλειψις), an astronomical phenomenon, being the disappearance of a heavenly body. This may happen in two distinct ways: either the disappearing body may be lost on account of another body coming between it and its source of light, and thus intercepting the light; or the disappearance of a body may be caused by another body coming between it and the spectator. We shall here enumerate the various kinds of eclipses.

The eclipses in which the disappearance takes place by the removal of the light from the body are—

1. The eclipse of the moon.
2. The disappearance of a portion of Jupiter's surface, occasioned by one of its satellites passing between it and the sun. This is usually called the transit of the satellite's shadow over the disc of Jupiter.
3. The eclipses of Jupiter's satellites.

The eclipses in which the disappearance arises from the absolute interposition of another planet are—

1. The eclipse of the sun, meaning the eclipse of the sun by the moon.
2. The eclipse of the sun (that is, of a very small portion of the sun) by Mercury or by Venus, commonly called the *transit* of Mercury or Venus over the sun's disc.
3. The occultation of a fixed star by the moon.
4. The eclipse of a portion of Jupiter by one of its own satellites, or transit of a satellite over the disc.
5. The eclipse of a satellite of Jupiter by Jupiter itself, or occultation of a satellite by the planet.

We have here mentioned such eclipses as are not unfrequent: the only additional phenomenon which we are aware of is the eclipse of a portion of the ring of Saturn by a satellite, or passage of a satellite over the ring, seen by Sir W. Herschel. The satellites of Saturn must suffer eclipses of the first kind by entering the shadows either of the planet or the ring, and of the second kind both from the planet and the ring; but these satellites are only seen with very good telescopes and under very favourable circumstances, so that their eclipses excite little public curiosity.

ECLIPTIC. [EQUATOR AND ECLIPTIC.]

ECLOGUE. [BUCOLICS.]

ECONOMY, POLITICAL. [POLITICAL ECONOMY.]

ECPHIMO'TES (Fitzinger), a genus of Saurians, possessing the teeth and pores of the genus *Polychrus*, but with small scales on the body only. The tail, which is large, has great scales, which are pointed and carinated. The head is covered with plates. The form is a little short and flattened like that of some of the *Agamæ*, rather than like the slender shape of *Polychrus*. Example, *Ecphimotes tuberculatus* (*Agama tuberculata*, Spix; *Tropidurus torquatus*, Pr. Max.)

Description. — Ash-coloured, sprinkled with whitish blotches, a demi-collar of black on each side of the neck. Locality, Brazil.

ECUADOR, one of the Spanish American re-

publics. It lies between 5° 50′ S. lat. and 1° 12′ N. lat., and between 69° 40′ and 80° 40′ W. long. It is bounded on the N. by Venezuela and New Granada, on the E. by Brazil, on the S. by Peru, and on the W. by the Pacific. The Andes run nearly N. and S. through Ecuador, and form two mountain-knots called Loxa and Los Pastos. Two nearly parallel ridges of mountains extend from knot to knot, inclosing between them a valley 300 miles long by 15 or 20 broad. Transverse ridges break up this valley into three smaller ones, of Cuença, Alausi, and Quito. Among the lofty summits of Ecuador are Cotopaxi (18,880 feet), Chimborazo (21,420), Yliniza (17,376), Antisana (19,136), Cayambe (19,548). Even the valleys are nearly 10,000 feet high. West of the Andes smaller mountains occupy most of the space to the Pacific. East of the Andes the country is mostly a plain. The Amazon is the chief river. [AMAZON.] Its affluents in Ecuador are the Marona, Pastaza, Tigre, and Napo. The short rivers which flow into the Pacific are the Patias, Esmeraldas, and the river of Guayaquil.

The temperature in the valley of Quito varies only within the limits of 48° and 67° Fahr.; and the difference between winter and summer is very slight. This and the other valleys have suffered from numerous earthquakes. Near the coast the average temperature is much higher, and the distinction between rainy and dry seasons is more marked. The valley of the Amazon is very hot, and subject to almost daily rains. Agriculture varies with the altitude. Near the snow-line (15,750 feet) only a few plants grow. At about a height of 10,000 feet good pasturage occurs. From thence down to 4000 feet, cerealia and fruits are cultivated. At lower altitudes, sweet potatoes, mandioca, yams, bananas, rice, Indian corn, sugar, cocoa, cotton, tobacco, fruits, and numerous other plants and roots occur. Sheep and cattle are reared in great numbers; horses, asses, and mules to a smaller extent. Gold, silver, lead, and quicksilver mines are worked, but not so largely as in other parts of the Andes.

The population of Ecuador is composed of the descendants of the Spaniards and of the aborigines. Those Indians who inhabit the elevated valleys belong to the race of the Peruvians, and speak the Quichua language. They are mostly agriculturists, and cultivate their lands with much care. They apply themselves also to manufactures, and make coarse stuffs of wool and cotton. The Indians who inhabit the eastern plain are much lower in civilization. They cultivate only small pieces of ground, and apply themselves almost exclusively to fishing and hunting. The whole population is supposed to be about 600,000. The country is divided into three departments, Chimborazo, Guayaquil, and Assuay. The chief towns, with their population, are—Ibarra (8000), Otavalo (20,000), Quito, the capital (50,000), Tacunga (3000), Lactacunga (10,000), Hambato (12,000), Guayaquil (25,000), Cuença (20,000), Loxa (10,000), Zaruma (6000), and several of minor note. There are three roads, or routes, from the interior valleys to the Pacific. In many of the elevated valleys are remains of the palaces of the Incas. The manufactures of the country consist chiefly of wool and cotton, but they are of very small amount. The exports of cinchona-bark, and other natural produce, take place almost wholly from Guayaquil, from which port there is a steep road up to Quito. [GUAYAQUIL; QUITO.]

The cotton exported from Ecuador in 1843 amounted to 80,000 lbs.; in 1844, 256,000 lbs. The cocoa exported in 1843, 15,338,970 lbs.; in 1844, 8,565,500 lbs. Vessels which entered and left Guayaquil (the only port) in 1843, 193; in 1844, 167. The yellow fever prevailed at Guayaquil in 1844, to the detriment of its trade.

Ecuador was discovered by Pizarro in 1526, and came into the hands of the Spaniards, who remained in possession of the country up to the year 1812, when the country declared against them. Quito was then a part of the vice-royalty of New Granada, and it participated fully in the frequent vicissitudes of the war, which ended in 1823 with the complete expulsion of the Spaniards. By the convention of Cucuta in 1821, New Granada and Venezuela united and formed one republic under the name of Colombia, but this union lasted only to 1831, when these countries again separated, and Ecuador separated from New Granada. Ecuador is a republic, governed by a president, vice-president, council of state, senate, and house of representatives, which has one member for every 40,000 inhabitants.

(Condamine; Ulloa; Humboldt; Caldas in Mollien's *Travels; Parliamentary Papers.*)

EDA'PHODON, a genus of fossil Placoid fishes, from the London clay and Bagshot sand, three species. (Agassiz.)

EDDA. The northern mythology, which in regard to wild imagination and sublime conceptions surpasses that of Greece or Rome, is chiefly contained in two collections called 'The Eddas,' which have been handed down from time immemorial by the scalds, or ancient minstrels, of Denmark, Sweden, Norway, and Iceland. The word Edda signifies Mother of Poetry. In the beginning these mythological records were communicated from mouth to mouth, and afterwards written down with the sacred characters of the north, the Runic characters, an alphabet which the Scandinavians are said to have obtained from the seafaring Phœnicians. The Scandinavians initiated in the mysteries of their religion the Saxons, who were forced by Charlemagne to exchange it for Christianity. After the conquest of the Saxons by Charlemagne, the worshippers of the religion of *Odin* withdrew to Iceland, where the sacred books of the Scandinavians were preserved, from which Samund Sigfudson, a clergyman, and Are Frode, the historian, collected, between the years 1056 and 1133, the older Edda.

This important work was concealed and forgotten for nearly 400 years. However in the year 1643 a fine copy of these poems was found by Bishop Svensen, and published in 3 vols. 4to., containing the original text, a Latin translation, and a dictionary of the northern mythology. The contents of the poems are prophecies, elevated conversations, and magic songs.

The new Edda, composed or arranged two hundred years later, is a systematic poetical compendium of the former, and is divided into three books; one dogmatical or doctrinal, the second narrative, and the third critical. The Icelandic text of this second Edda was translated in the year 1640, by Resenius, and hence it is called the Resenian Edda.

EDDY. [WHIRLPOOL.]

EDDYSTONE LIGHTHOUSE. [PLYMOUTH.]

EDELINCK, GERARD, an engraver and painter, was born in 1649 at Antwerp. He afterwards settled in France, was made engraver to the king (Louis XIV.), a member of the Royal Academy of Painting, and died in Paris in 1707. A remarkably pure and brilliant burin, a bold manner, correct drawing, fidelity to nature, and inimitable harmony of execution, place the works of Edelinck in the highest rank among those of his nation. His engravings of the Holy Family, after Raphael; Alexander in the Tent of Darius, after Lebrun; the Combat of Cavalry, after Leonardi da Vinci; and the Crucifixion, after Lebrun, are excellent. He was equally happy in his portraits, of which he has left a great number of the most distinguished characters of his age.

EDEN. [CUMBERLAND.]

EDENTA'TA, Cuvier's sixth order of mammiferous animals, characterised by the absence of teeth in the front of the jaws. Their claws are large, and they are more endowed with strength than agility. Cuvier divides them into three tribes.

1st, The *Tardigrades*.—Example, *the Sloths* (*Bradypus*, Linn.) [AI.]

2nd, The *Armadillos* (*Dasypus*, Linn.) [ARMADILLO.] *Chlamyphorus* [CHLAMYPHORUS] comes under this tribe, as well as *Orycteropus* [AARDVARK], *Myrmecophaga* [ANT-EATER], and *the Pangolins* (*Manis*, Linn.)

The third tribe consists of the Monotremes. [ECHIDNA; ORNITHORHYNCHUS; MONOTREMES.]

Some large extinct fossil animals, the *Megatherium* and *Mylodon*, for instance, belong to this order.

EDESSA. [MESOPOTAMIA.]

EDFU, a village of about 2000 inhabitants in Upper Egypt, on the left bank of the Nile, is remarkable only as the site of one of the largest and best preserved of the ancient Egyptian temples, on the roof and in the precincts of which the huts composing the village are built. The inhabitants manufacture earthenware vessels, to which they give the forms represented in Egyptian tombs. [EGYPTIAN ARCHITECTURE.]

EDGAR, surnamed the Peaceable, the youngest son of King Edmund I. by his wife Elgiva, or Algiva, was born about the year 943. On his father's death in 946, his brother Edwy, or Eadwy, being only a year or two older, Edmund's brother Edred was unanimously chosen to succeed him by the Witenagemote. On the death of Edred, in 955, Edwy was placed on the throne; and Edgar was appointed governor or sub-regulus of Mercia, which was still considered as a distinct, though subject kingdom. Disputes soon arose between the brothers, but the death of Edwy, in 959, made Edgar king of all England.

The celebrated Dunstan, banished by Edwy, became the chief counsellor of Edgar, and the government of the kingdom, under the guidance of this ecclesiastic, was unquestionably conducted with remarkable ability and success. Throughout the whole reign England remained undisturbed by war; the northern pirates were, during his life, deterred from showing themselves on the English coasts by the powerful naval force that was kept up by this king. Another work of great public benefit which is attributed to him is the reformation of the coinage, and he is said to have freed Wales from wolves; but there were wolves in England long after this. Edgar has been chiefly lauded by the monkish annalists for his restoration of the church both to its ancient possessions and to a more perfect state of discipline than it had probably ever before known. Under the vigorous administration of Dunstan, the married clergy were at length removed almost to a man from the cathedrals and abbeys; and no fewer than fifty-four monasteries were founded or restored in different parts of the kingdom, and filled with monks as well as richly endowed. They were all subjected to the Benedictine rule.

The laws of Edgar that have been preserved consist partly of some enactments touching the payment of the tithes and other church dues, and partly of a few civil regulations chiefly relating to the improvement of the police of the kingdom, and the better administration of justice. These laws however were only enforced in the Saxon provinces of Edgar's dominions. To his Danish subjects, who occupied nearly or fully half the kingdom, he appears to have only recommended the adoption of some of the English laws; and it was not till towards the close of the reign of the Confessor that the authority of the English law was fully extended over the part of the country which they occupied.

The monkish writers, with whom Edgar was a great favourite, and who give lofty descriptions of his power and extensive authority, have not altogether concealed the fact that he was no saint in his morals. He was twice married, first to Elfleda the Fair, by whom he had a son, Edward, who succeeded him; and, secondly, to Elfrida, the daughter of Ordgar, earl of Devonshire, who bore him Edmund, who died in his infancy, and Ethelred, for whom his mother opened a way to the throne by the murder of Edward. The generally known circumstances of the marriage of Edgar and Elfrida are related by William of Malmsbury, on the faith of an ancient ballad. Edgar died in 975, when he was succeeded by his eldest son, Edward, afterwards designated the Martyr.

EDGAR ATHELING, that is, Edgar of the blood royal, or Prince Edgar, was grandson of King Edmund Ironside, through his son Edward, surnamed the Outlaw. Edward and his brother had been sent from England by Canute, in 1017. They found their way to Hungary, where Edward married and had three children, Edgar, Margaret, and Christina, but the dates of their births are not known. Edward, after an exile of forty years, was sent for to England, in 1057, by his

uncle, King Edward the Confessor, who professed an intention of acknowledging him as next heir to the crown. Shortly after his arrival Edward died, and Earl Harold and the Duke of Normandy have been both suspected, without any proof however, of having procured his death. Edgar now assumed the title of Atheling, hitherto borne by his father, and was generally looked upon as the heir to the crown, he being now the only remaining male descendant of Ethelred II.

Edgar was still in England when the Confessor died, in January, 1066; but he appears to have taken no part in the contest between Harold and William, and although, on the destruction of the power of Harold at the battle of Hastings, he was proclaimed king by the citizens of London, he was one of the first to go to the Conqueror at Berkhamstead, and to offer full submission. William allowed him to retain the earldom of Oxford, but in 1068 Edgar appears to have fallen into the hands of the discontented Northumbrian lords, who carried the heir of the Saxon line and his mother and sisters to the court of the Scottish King Malcolm Canmore, who married Edgar's eldest sister, Margaret; and of this marriage came Matilda, whose union (A.D. 1100) with Henry I. of England was the first step towards the reconcilement of the Saxon and Norman races.

A powerful confederacy was now formed against the English king. York Castle was taken by storm on Oct. 22, 1069; but on the approach of William with an army, the confederates fled, and Edgar retired to Scotland. In 1073, at the instigation of Philip, king of France, he set out for that country, in order, with the support of Philip, to attack either England or Normandy, but he was shipwrecked on his passage, and forced to return to Scotland. He soon afterwards made his peace with William, and seems to have attached himself particularly to his son Duke Robert, with whom he was for a time in Normandy, and in conjunction with whom he mediated a peace between Malcolm and William Rufus, in 1091. After Malcolm and his eldest son had fallen in a conflict with an English force near Alnwick, on the 13th Nov. 1093, and his queen had died three days after, Edgar protected the children of his deceased brother-in-law and sister from the attempts of their uncle, Donald Bane, who had usurped the Scottish throne, and ultimately succeeded in restoring his nephew Edgar to the throne in 1097. In the war between Henry I. and his brother Robert, Edgar sided with the latter, and was one of the prisoners taken at the decisive battle of Tinchbrai on Sept. 27, 1106. Edgar was soon restored to his liberty, but the remainder of his history is very obscure. William of Malmsbury only informs us, without specifying any date, that he died in England after having lived to a good old age, without ever having been married or having had any issue, leaving behind him the character of a weak but inoffensive and well-intentioned man.

EDGEWORTH, RICHARD LOVELL, an ingenious mechanical philosopher, but better known as the father and literary associate of Maria Edgeworth, was born at Bath, in 1744. He was descended from an English family, which had settled in Ireland in the reign of queen Elizabeth, and resided at Edgeworth-Town, in the county of Longford, where his boyhood was chiefly spent. He was entered of Corpus Christi College, Oxford, but a marriage contracted at nineteen, withdrew him from the university. In 1765 he began to study for the law; but his father's death in 1769, which gave him possession of a handsome fortune, caused him to relinquish the law as a profession.

Mr. Edgeworth was throughout his life distinguished by his activity of spirit and ingenuity in mechanical contrivances. He erected the first telegraph in England, and on his settling in Ireland in 1782, besides giving great attention to the education of his children, the results of his experience in which were afterwards embodied in his 'Practical Education,' written principally by his daughter, he was active and influential as a magistrate and a landlord; engaged in a variety of projects for reclaiming bogs, establishing a system of telegraphic communication, experiments on the construction of carriages, moveable railroads, &c. He died June 13, 1817, after an old age of unusual activity and power of enjoyment.

Mr. Edgeworth said he was not a ready writer; and it may have been partly owing to this that he preferred engaging in a sort of literary partnership with his daughter to embarking alone in any work of length. 'Practical Education' and 'Irish Bulls' were avowedly written by them in common; and Miss E. in her fathers 'Memoirs' (vol. ii. chap. xvi.) has recorded in warm terms of filial affection her obligations to him in her other works.

The following works are published in his name:—'Rational Primer;' 'Poetry Explained;' 'Readings in Poetry;' 'Professional Education;' 'Letter to Lord Charlemont on the Telegraph;' 'Speeches in Parliament;' 'Essay on the Construction of Roads and Carriages;' and several papers in the 'Philosophical Transactions,' 'Nicholson's Journal,' and the 'Transactions of the Royal Irish Academy' on various subjects.

(Memoirs of R. L. Edgeworth, 1820.)

EDICTA, EDICTS. [EQUITY.]

EDINBURGH, a city, the metropolis of Scotland, and the capital of Edinburghshire, is situated in 55° 57′ 20″ N. lat., and 3° 10′ 30″ W. long. It stands upon a group of hills, separated by deep depressions. On the highest of the hills the Old Town is built. The ascent to the summit of the hill forms a street upwards of a mile long, in nearly a straight line from the palace of Holyrood on the east, about 120 feet above the level of the sea, to the Castle, which is elevated upwards of 380 feet above the same level, and is accessible only on the eastern side, all the others being nearly perpendicular. The view from this height is singularly varied and grand.

Edinburgh is supposed to have derived its name from Edwin, a king of Northumberland in the time of the Heptarchy. It was a royal burgh at the time of the foundation of Holyrood Abbey, in 1128; and a royal residence is supposed to have been built there soon afterwards. The city remained open and defenceless till the 15th cen-

tury; but at that time King James II. granted a licence for fortifying the city. James III. made Edinburgh a sheriffdom within itself; and James V. made it the capital of the kingdom. The union of the two kingdoms checked the advancement of Edinburgh; but very great improvements and enlargements have been made within the last 70 years.

Edinburgh is divided into three principal parts: the Old Town, the South Town, and the New Town; each of which has its own peculiar features and character. The Old Town is intersected by the street previously mentioned: on each side descend in regular lines a multitude of narrow wynds, closes, and styles, which on the south lead for the most part into the Cowgate, a confined street running along the southern base of the hill. Over this street the South Bridge, and King George the Fourth's Bridge, are thrown, to connect the Old Town with the South Town. The South Town is built on rising ground, less lofty than the central hill. On a line with the South Bridge is the North Bridge, thrown from the summit of the Old Town ridge to the rising ground which forms the site of the New Town. This New Town having been erected according to regular plans conceived in a spirit of improvement, the greatest regularity and beauty characterize its buildings, streets, and squares. A clumsy earthen mound crosses from the Old Town to the New, over a hollow which was formerly called the North Loch, but which has been drained, and is now partly occupied by the station of the North British, Glasgow, and Leith Railways. To the east of the New Town is the Calton Hill; and south-east of this is Arthur's Seat, which rises to a height of 822 feet.

Among the chief buildings of the city is the Castle. It is now a place of little strength, and derives its interest chiefly from the associations connected with it and its own formidable appearance. At no great distance from the Castle stands the Parliament House, with the courts of justice. In the first of these the parliament of Scotland met between 1640 and the Union. The hall now forms the Outer House of the Court of Session, and in its immediate neigbourhood are rooms appropriated to the Inner House and to the courts of Justiciary and Exchequer. The courts of the sheriff and justices of the peace are held in the county hall; and near this are the buildings in which are deposited the valuable libraries of the Advocates and the Writers to the Signet. The ancient gothic fabric, formerly the cathedral of St. Giles, is also in this neighbourhood. On the opposite side of the street is the Royal Exchange, with the common council-room and other offices of the magistracy; and, in the centre of the street, a little way down, is a radiated causeway to mark the site of the old market cross. At the foot of the High Street stood one of the oldest stone houses in Edinburgh, the house of the great Scottish reformer, John Knox; this has been destroyed during the present year (1848), to make room for some new Free Church buildings. Below this is the street called Canongate, at the foot of which are the palace and abbey of Holyrood. On the summit of the Calton Hill some columns of the National Monument have been erected, and stand in solitary grandeur. Near them are the observatory, and the monuments to Dugald Stewart, Playfair, Burns, the Scottish Political Martyrs, and a few other persons. On the low ground, towards the west, are the bridewell and gaol; and in the same line stands the Register House, where the public records of the kingdom are preserved, and, what is almost peculiar to this part of the empire, the register of all deeds conveying or charging territorial property.

The Edinburgh churches are very numerous, especially since the Secession of 1844, which has led to the erection of many by the Free Church party. Some of the older churches are remarkable and interesting.

Edinburgh has some noble hospitals and charitable institutions. Among these are—the Royal Infirmary, erected on a rising ground in the neighbourhood of the college; Heriot's Hospital; Watson's Hospitals, Merchant-Maiden and Trades'-Maiden Hospitals, Orphan Hospital, and Gillespie's Hospital; Institution for the Deaf and Dumb, Asylum for the Blind, Magdalen Asylum, and Lunatic Asylum. Perhaps the most splendid of all is Donaldson's Hospital, recently erected. Most of the banking-houses of Edinburgh are large edifices: such, in particular, are the Bank of Scotland, the Royal Bank, and the Commercial Bank. The Scott monument, in Prince's Street, finished in 1844, is one of the most beautiful objects in Edinburgh. There are a few columns and statues placed at the outer section of the street in the New Town. There are two theatres and an assembly room; but the institutions for literature and science are more numerous than those for mere pleasure. There is a Zoological Garden, a Botanical Garden, and a Horticultural Garden, and there are several cemeteries.

Edinburgh returns two members to the House of Commons. The government of the city of Edinburgh is vested in the magistracy and town-council. The magistracy consists of a lord provost, a dean of guild, a treasurer, and four baillies, each of whom is ex officio a member of the council. The council consists of seventeen merchants, six deacons, and two trades' councillors. One-third part of the councillors go out of office every year, but are eligible for re-election. The provost, baillies, treasurer, and other office-bearers, are elected by the councillors. The provost's term of office is three years. There are eight incorporated crafts within the burgh, all enjoying exclusive privileges, and possessed of funds which are appropriated to the support of decayed members or the widows of such as are deceased. The corporate funds were so badly managed some years ago, that in 1834 the city was declared bankrupt, and the revenues placed in the hands of trustees for the general benefit.

The population of the city of Edinburgh in 1841 was 56,330. The population of the parliamentary borough, which includes the greatest part of the suburbs, was 132,977, the entire population of city and suburbs being 138,182.

The University of Edinburgh consists of the College of King James, founded by James VI. of Scotland, by a charter dated 24th April, 1582. By this charter the provost, baillies, and town councillors of Edinburgh, and their successors in office, were invested with the sole power both of electing the professors and of dismissing them. In virtue of this authorization, indeed, the corporation has ever since assumed nearly the entire direction and control of the university. The Senatus Academicus, or body of professors, is understood not to have the right of interfering in any of these matters, although it may have sometimes passed regulations of discipline which the town council has not thought proper to disturb. In modern times, about eight or nine new professorships have been founded by the crown, of which it has retained the patronage. The bursaries or exhibitions attached to the university are eighty in number, of which three are of the annual value of 100*l.* each; six of 30*l.*; ten of 20*l.*; five between 20*l.* and 15*l.*; eleven between 15*l.* and 10*l.*; forty-two between 10*l.* and 5*l.*; and three under 5*l.* The total amount is about 1172*l.* per annum. The library belonging to the university contains about 100,000 volumes. An observatory, a museum of natural history, an anatomical museum, and a botanical garden also belong to the university.

The buildings of the university consist of a single quadrangle, on a very magnificent scale. They have only recently been completed. The funds have been derived partly from subscription, and partly from parliamentary grant. There are 30 professorships. A few of them have salaries without class fees; a few have class fees without salaries; but most of them have both salaries and class fees, which form an income varying from about 100*l.* to 2000*l.* per annum. There are four faculties—divinity, law, medicine, and the arts, each of which has a dean. The medical faculty has long borne a high character.

The other educational establishments of Edinburgh, including the *high* school, the Edinburgh academy, the sessional school, and many others.

EDINBURGHSHIRE, also called *Mid-Lothian*, a county of Scotland, is bounded N. by the Frith of Forth, N.W. by the county of Linlithgow, N.E. by that of Haddington, E. by that of Berwick, and S.W. and S. by portions of the counties of Lanark, Peebles, Selkirk, and Roxburgh. It lies between 55° 37′ and 55°.59′ N. lat., and between 2° 50′ and 3° 42′ W. long. The form is irregular. The medium length is about 24 miles; the medium breadth about 15 miles. The area is 354 square miles, or 226,560 acres, of which about 145,000 acres are under cultivation. The population in 1841 was 225,454.

The Lammermuir Hills extend through the whole of the south-eastern part of the county. The Lammermuir Hills belong to the transition series, and consist almost entirely of grauwacke. The top of the Soutra hill is 1230 feet above the sea. Near the summit of this hill stood formerly a church and village, with an endowed hospital for the relief of pilgrims. The Pentland Hills extend from Lanarkshire into the central part of the county, running from S.W. to N.E. at an elevation of from 1600 to 1700 feet above the sea. The Pentland Hills are chiefly of porphyry, of which the prevailing kinds are felspar porphyry and claystone porphyry. On the summits of the Pentland Hills boulders of granite are found, the original site of which has been traced to be 60 miles off, at Dunkeld and Benlomond. The county between the Lammermuir Hills and the Pentland Hills, and north of the Pentlands to Linlithgowshire and the Frith of Forth, is generally undulating, with many hills of considerable elevation. There are valuable strata of limestone and freestone, as well as a portion of the Scotch coal-field in the county.

The Breich Water flows N.E. from the north-western point of the county, and joins the Almond Water, which also flows N.E. into the Frith of Forth, these rivers dividing the county from Linlithgowshire. The Linhouse Water is a tributary to the Almond Water. The Water of Leith rises in the north-western ridges of the Pentland Hills, receives in its upper course many small affluents, and flowing N.E. and N. falls into the Frith of Forth at Leith. The North Esk rises among the south-eastern ridges of the Pentland Hills, and flows N.E. past Dalkeith. The South Esk rises in the north-western ridges of the Lammermuir Hills, and flows N. till it unites with the North Esk below Dalkeith, where the united stream, then called the Esk, flows N. to the Frith of Forth at Musselburgh. The beautiful stream called the Logan Water rises in the eastern ridges of the Pentland Hills, and flowing E. and S. falls into the North Esk at Auchindinney. The Crawley Spring, from which Edinburgh and Leith are abundantly supplied with water, is near the Logan Water, at the eastern edge of the Pentlands. It throws out 60 cubic feet of water per minute. The Gala Water rises in the Lammermuir Hills, and flows S. and then E. through Roxburghshire to its junction with the Tweed.

The soils are of the greatest variety, from the finest loams to gravels and stiff clays. Among the Pentland Hills and Lammermuir Hills are much moorland and moss. Draining has been carried on extensively, by which and by heavy manuring even bad soils have been made highly productive, especially in the neighbourhood of Edinburgh and Leith. The rotation of crops is different in different parts of the county. A large proportion of the agriculture of the county is appropriated to the production of grain and vegetables for the supply of the city of Edinburgh.

Edinburghshire returns one member to the House of Commons, in addition to which two members are returned for the city of Edinburgh, and one member for the Leith district, which comprises Leith, Musselburgh, and Portobello.

The following are the principal towns, with the population of each in 1841:—

Dalkeith is situated on the peninsular ridge which slopes, abruptly on the north side and more gradually on the south, to the banks of the North Esk and South Esk. The town is generally well built, and has many houses of recent erection. The parish church is ancient. A new

church, in the early English style, was built in 1840 by the Duke of Buccleugh, under whom the town is a burgh of barony. There is a large iron-foundry, a gas-work, and there are manufactures of felt and beaver hats, straw hats, and woollen stuffs. There is an endowed grammar-school. The town has a large weekly market for grain, and has communication by railway with Edinburgh. Population, 4831. Adjoining the town is the mansion of the Duke of Buccleugh, with its extensive park, which is watered by the two rivers.

Edinburgh is the capital of the county. [EDINBURGH.]

Leith. [LEITH.]

Musselburgh, a royal burgh, is seated on the eastern bank of the Esk, near its entrance into the Frith of Forth. The harbour is very shallow, having only 4½ feet of water at neap tides, but has a substantial quay. The port has no vessels belonging to it, but is resorted to by coasters, and by small vessels from Holland, Norway, and Prussia. The town is very ancient, and an old Roman stone bridge across the Esk is still used by foot passengers. A handsome stone bridge of five elliptic arches, designed by Sir John Rennie, was erected in 1806–7, about 300 yards below the Roman bridge. There are two wooden bridges still lower down. There are manufactures of sail-cloth and hair-cloth. A handsome new church was erected in 1838. There are coal mines in the neighbourhood. Population of the town, 6331. It is included in the Leith parliamentary district.

Portobello is a very handsome modern town, on the shore of the Frith of Forth, about halfway between Musselburgh and Leith. The houses are well built of freestone, which is obtained in the neighbourhood. Portobello is resorted to as a sea-bathing place, and hot and cold baths were constructed upon an improved plan in 1805. There is a chapel of ease. Portobello is contributory to the Leith parliamentary district. Population of the town, 3479.

(*New Statistical Account of Scotland.*)

EDMUND I., king of the Anglo-Saxons, was the son of King Edward the Elder, by his third wife, Edgiva. He was born about 923, and succeeded his half-brother, Athelstane, 27th October, 941. He made war with the Northumbrian Danes, on the whole successfully, and in 945 reduced the independent state of Cumbria, which he made over to Malcolm I. of Scotland, to be held by him as the vassal of the English crown. The reign of Edmund, who was distinguished by his taste for elegance and splendour, on which account he received the surname of the Magnificent, was terminated May 26, 946, by his assassination by an outlaw of the name of Liof.

King Edmund I. left by his wife, Elfgiva, two sons, Edwy and Edgar, who eventually both sat on the throne; but as they were mere children, his immediate successor was his brother Edred.

EDMUND II., king of the Anglo-Saxons, surnamed Ironside, was the son of king Athelred II., and was born A.D. 989. The name of his mother, and even his legitimacy, has been disputed. He appears, in the history of the latter years of his father's calamitous reign, as the chief champion of the English cause against Canute and his Danes, who had by this time nearly overrun the kingdom. On the death of Ethelred in 1016, Edmund was proclaimed king by the burgesses of London, and soon afterwards at least all the kingdom of Wessex appears to have submitted to his authority.

The short reign of Edmund was nearly all spent in a continuation of the sanguinary struggle in which he had already so greatly distinguished himself. His exploits are dwelt upon by the old national chronicles with fond amplification, but it is not very easy to separate what is of historical value in their narratives from the romantic decorations. Several battles were fought, of which the sites are a matter of dispute; one is known to have been fought at Otford in Kent, where the Danes were defeated with great slaughter; and one at 'Assundun,' supposed to be either Assington in Essex, or Essendon in Hertfordshire, in which Edmund was totally defeated. After this Edmund and Canute, it is said, agreed to decide their quarrel by single combat. The encounter took place on an islet called Alney, or Olney, in the Severn, and Canute was obliged to yield and sue for his life. Whether the single combat took place or not, it is certain that an arrangement between the parties was now made, by which Mercia and Northumbria were made over to Canute; while Edmund was allowed to retain possession of the rest of the kingdom, with the nominal sovereignty of the whole. Edmund however died a few weeks after this pacification, having worn the crown only about seven months; and there are strong reasons for believing that he was made away with by the contrivance of Canute. Canute immediately mounted the vacant throne, A.D. 1016. Edmund Ironside left by his wife, Algitha, two sons, Edward, called the Outlaw, and another, whom some call Edmund, others Edwin.

EDOM. [IDUMÆA.]

EDRED, king of the Anglo-Saxons, was the youngest of the sons of Edward the Elder, his mother being Edgiva. [EDWARD THE ELDER.] Edred succeeded his brother, Edmund I., in 946, Edwy and Edgar, the two sons of Edmund, being excluded for the present by their extreme youth. Edred, soon after his succession, repressed in person an insurrection of the turbulent Danish population of Northumberland. In these military operations, as well as in the management of civil affairs, he was mainly directed by the counsels of his chancellor, Turketul, who had served in the same capacity under the two preceding kings, Athelstane and Edmund. Another distinguished character of this reign was the celebrated Dunstan, who owed his first rise at court to the patronage of Turketul. [DUNSTAN.] Edred died, after a reign of between nine and ten years, on Nov. 23, 955, and was succeeded by his nephew Edwy.

EDRIOPHTHALMA (Leach), an extensive group of crustaceous animals, with sessile eyes, which are generally compound, but sometimes

simple, situated on the sides of the head. The mandibles are often furnished with a palp, and the head is almost always distinct from the body. Desmarest makes the *Edriophthalma* comprehend the *Amphipoda* of Latreille, which the former observes Leach has not admitted, and which includes the two first sections of his legion *Malacostraca Edriophthalma*, and corresponds to the genus *Gammarus* of Fabricius. See Milne Edwards, Desmarest, and also Latreille (in Cuvier's 'Règne Anim.,' vol. iv.), whose orders *Amphipoda*, *Lœmodipoda*, and *Isopoda*, are arranged by Desmarest under the *Edriophthalma*. (p. 114, et seq.)

EDRISI flourished about the middle of the sixth century of the Mohammedan æra. Of the circumstances of his life little is known. He was a descendant of the family of the Edrisides, who for upwards of a century possessed the sovereignty over the Mohammedan provinces of Northern Africa. In A.D. 919, when the Edriside dynasty in Africa was overthrown by Mahedi Abdallah, the survivors of the family went to Sicily; and there Edrisi seems to have been born. The geographical treatise, which has made his name celebrated, was written at the command of Roger II., king of Sicily, whom he frequently mentions in the body of the work. He informs us in the preface that he completed it in the year 548 of the Hegira, A.D. 1153-4; and that it was intended to illustrate a silver terrestrial globe, which King Roger had caused to be made. The work itself affords internal evidence of having been written by a person who had visited Spain and Italy. The title is 'Nuzhat al-mushtâk fi ikhtirâk alâfâk,' *i.e.* 'Amusement of the curious in the exploring of countries.' The first volume of a French version of what seems to be the complete original work, by M. Amédée Jaubert, made from two Arabic manuscripts, appeared at Paris in 1836, 4to. The globe which this treatise was intended to illustrate is lost; but a planisphere, which is inserted in one of the Bodleian manuscripts, is engraved in Vincent's 'Periplus of the Erythrean Sea,' who observes (p. 568) that 'it is evidently founded upon the error of Ptolemy, which carries the coast of Africa round to the east, and forms a southern continent, totally excluding the circumnavigation into the Atlantic Ocean.' It appears, from a comparison of this planisphere with the maps of Fra Mauro and the globe of Martin Behem at Nürnberg, that for upwards of three centuries the globe of Edrisi remained the foundation upon which all subsequent representations of the earth's surface were constructed. In his descriptive treatise, Edrisi, like all other Arabian geographers, distributes the portion of the globe known at his time into seven climates, each of which he subdivides into ten regions: in the account which he gives of them he follows the uniform plan of proceeding from west to east; but he does not, like Abulfeda, determine the longitude and latitude of the places which he mentions. There is an Arabic abridgment of this work which contains little more than an itinerary of these different regions; but the original performance adds many remarks on their inhabitants and natural productions.

The Arabic text of the abridgment of Edrisi's work, which is now extremely scarce, appeared with a Latin title at Rome, in 1592, 4to. The Latin translation of the same, by Gabriel Sionita and Johannes Hesronita, bears the title, 'Geographia Nubiensis, id est, accuratissima totius orbis in septem climata divisi descriptio,' Paris, 1619, 4to. The name of Nubian, sometimes given to Edrisi, is founded on a mistake of these Latin translators.

EDWARD I., surnamed the Elder, king of the West Saxons, was the eldest son of Alfred the Great, by his queen Alswitha. On the death of his father, Oct. 26, 901, Edward was recognised by the Witenagemote as his successor; but the throne was contested by his cousin Ethelwald. The contest was terminated, in 906 or 907, by the death of Ethelwald, in a battle fought between his forces and those of Edward. East Anglia and the Northumbrian Danes next submitted to him, and Mercia, which had been governed by his sister Ethelfleda, also came under his government on her death in 920. After this, if we may believe the old historians, the Welsh, the people of Strathclyde, and the king of the Scots and all his subjects, also chose the English monarch as their lord.

Some of the laws of Edward the Elder are preserved, but they do not demand any particular notice. He died in 925, and was succeeded by his eldest son Athelstane, whose mother was Egwina, who also bore him another son and a daughter. By another wife, whose name is unknown, he had two sons and six daughters; and by a third wife, Edgiva, he had two sons, Edmund and Edred, both of whom were afterwards kings of England, and two daughters.

EDWARD II., king of the Anglo-Saxons, surnamed the Martyr, was the eldest son of Edgar the Peaceable, by his first wife, Elfleda. On the death of Edgar, in 975, the accession of Edward was opposed by a faction headed by his father's widow, Elfrida, in favour of her own son, Ethelred. Edward was supported by Dunstan, and was, after much opposition, formally accepted as king by the Witenagemote. Elfrida however still continued her intrigues, and caused Edward to be stabbed while drinking at the gate of Corfe Castle, where she resided, on March 18, 978. Edward was only 17 at the time of his death, and as he left no children, Ethelred succeeded to the throne.

EDWARD III., king of the Anglo-Saxons, surnamed the Confessor, was the eldest of the two sons of Ethelred II. by his wife Emma, the daughter of Richard I., duke of Normandy. He was born at Islip, in Oxfordshire, probably in the year 1004. At the close of 1013, when the successes of Sweyn, the Dane, drove Ethelred from his throne, and compelled him to retire to the Isle of Wight, he sent over his wife, with Edward and his younger brother Alfred, to Normandy, to the care of their uncle, Duke Richard II. Edward spent the greater part of his time in Normandy, till 1035, occupied chiefly in the offices of religion and in hunting. Canute had married his mother, Emma, in 1017; she had borne him one son,

Hardicanute, to whom she endeavoured to secure the succession on Canute's death. Edward then made a slight demonstration in favour of his own rights, but soon returned to Normandy. In 1033 his younger brother Alfred proceeded to England at the head of another expedition, which terminated in his destruction, brought about apparently by treachery, though there does not seem to be sufficient ground for the horrid suspicion, that the contriver of the plot was his own mother. When Hardicanute was firmly seated on the throne, he sent for his half-brother Edward, to whom he allowed a handsome establishment, and who appears to have been considered as the heir to the crown in default of issue of the reigning king. Hardicanute died on the 4th of June, 1042, and Edward was immediately recognised as king by the assembled body of clerical and lay nobility.

In 1044, Edward, probably in compliance with a promise which he had made to Earl Godwin, married *Editha*, the only daughter of that earl, having previously informed her, however, that although he would make her his queen she should not share his bed. This unnatural proceeding has been usually attributed to religious motives; but he seems to have been without human affections of any kind. His first act after coming to the throne was to proceed to the residence of his mother at Winchester, and not only seized by force all her property, but, as is stated, endeavoured to destroy her by an accusation from which she freed herself by the ordeal.

The public events that form the history of the reign of the Confessor resolve themselves for the most part into a contest between two great parties or interests which divided the court and the country. Edward had spent in Normandy all his life since his childhood; his tastes and habits had been formed in that country; and all his oldest personal friends were consequently Normans. But while the inclinations of Edward were probably from the first with the Normans, he was to a great extent in the hands of the opposite or English party, from his connection with Earl Godwin, its head. It was not however till the year 1051 that the strength of the English and Norman parties was tried in any direct encounter; but that year a broil arose out of the visit to England of Edward's brother-in-law, Eustace, count of Boulogne. The first effect was the banishment of all the Godwin family, and the degradation and imprisonment of the queen. The following summer, Godwin and his son Harold forced their way back to the country. The queen was re-established in her possessions and her place, and the Normans were all expelled from the kingdom.

Earl Godwin only survived this counter-revolution a few months: he died suddenly as he sat at the royal table, on the 15th of April, 1053. His son Harold inherited his possessions and his power, and the ascendancy of the family under its new head continued as great as ever during the remainder of the Confessor's reign. Edward died on Jan. 5, 1066, and was buried the following day in the new Abbey of Westminster, which had just been finished, and consecrated with great pomp about a week before. On the same day Earl Harold was solemnly crowned king of England. [EDGAR ATHELING; HAROLD II.]

Edward the Confessor was canonized by Pope Alexander III. about a century after his death, and the title of the Confessor was first bestowed upon him in the bull of canonization. It may also be mentioned, that the use of the Great Seal was first introduced in this reign.

EDWARD I., king of England, surnamed Longshanks, was the eldest son of Henry III. by his wife *Eleanor*, second daughter of Raymond, count of Provence. He was born at Westminster, June 16, 1239. In 1253, to reconcile a disputed claim to the duchy of Guienne, Edward was married to Eleanor, the sister of Alphonso X., of Castile, who thereupon resigned whatever right he had to the duchy to his brother-in-law. After this, in 1254, we find the lordship of Ireland, and all the provinces which had been seized from his father, John, by the king of France, granted by Henry III. to his son, Prince Edward.

Edward early manifested a character very unlike that of his weak and imprudent father; and even from his youth we find him taking part in important affairs of state. In 1263, during the quarrel between Henry and his barons, the military operations on the king's side were principally conducted by Prince Edward. Though at first unsuccessful, and even taken prisoner with his father at the battle of Lewes, fought May 14, 1264, he succeeded in establishing his father's authority, the last of the insurgents, who had taken up their position in the Isle of Ely, having surrendered in July 1267.

In 1269, Prince Edward, with numerous followers, set out to join the crusaders to the Holy Land, where he arrived in May 1271. He distinguished himself on many occasions, and received a wound in the arm from a poisoned dagger, from the effects of which he is said to have been delivered by the princess, his wife, who sucked the poison from the wound. At last, having concluded a ten years' truce with the Saracens, he left Palestine in August, 1272, and set out on his return to England. While on his way his father died, and after his arrival in England with his queen, they were crowned at Westminster, Aug. 19, 1274.

The first military operations of Edward's reign were directed against the Welsh, whose prince, Llewellyn, having been slain in battle, and his brother and successor, David, taken prisoner and barbarously put to death, Wales was finally united to England.

The conquest of Wales was followed by the attempt to conquer Scotland. The pretence for the interference, and the general course of events and the issue, will be found under BALLIOL, WALLACE, and BRUCE. During a part of the time occupied by this contest, Edward was also involved in a war with Philip IV. of France, with whom he concluded a truce in 1297. The expenses of his Scottish and French wars had pressed heavily upon the resources of the kingdom; and when he asked for more money, both clergy and laity refused him any farther grant without a redress of grievances and a confirmation of the several great

national charters. After standing out for some time, he was obliged to comply with these terms: Magna Charta and the Charter of Forests were both confirmed, with some additional articles, in a parliament held at Westminster in October, 1297.

While marching to make a decisive attack on Bruce and Scotland, Edward died at Burgh-on-the-Sands, July 7, 1307. On his death-bed he is said to have enjoined his son and successor to prosecute the design which it was not given to himself to finish. According to Froissart, he made him swear that after the breath had departed from the royal body he would cause it to be boiled in a cauldron till the flesh fell off, and that he would preserve the bones to carry with him against the Scots as often as they should rebel. This oath however, if it was taken, was not kept. The corpse of King Edward was interred in Westminster Abbey on the 28th October.

Edward I. was twice married. By his first wife Eleanor, daughter of Ferdinand III., king of Castile and Leon, he had four sons: three, who died young, and Edward, who succeeded him. He had also by Eleanor nine daughters. Queen Eleanor died 28th November, 1291, at Grantham, or, according to another account, at Hardeby, in Lincolnshire: her body was brought to Westminster to be interred, and crosses were afterwards erected on the several spots where it rested on the way, of which those of Northampton and Waltham still exist. Edward's second wife was Margaret, eldest daughter of Philip III., and sister of Philip IV., kings of France. By her he had two sons: Thomas, born at Brotherton in Yorkshire, 1st June, 1300, afterwards earl of Norfolk and earl marshal; and Edmund, born 5th August, 1301, afterwards earl of Kent; and one daughter, who died in her childhood. Queen Margaret died in 1317.

Edward was eminently possessed of activity, decision, military skill, and political foresight; and though engaged during nearly the whole of his reign in war, he paid great attention to the civil government of his kingdom. Sir Matthew Hale ('Hist. of the Common Law of England,' chap. 7) has remarked that more was done in the first thirteen years of his reign to settle and establish the distributive justice of the kingdom than in all the next four centuries. Blackstone has enumerated under fifteen heads the principal alterations and improvements which the law underwent in the reign of Edward I.: the confirmation and final establishment of the two great charters; the definition and limitation of the bounds of ecclesiastical jurisdiction; the ascertainment and distribution of the powers and functions both of the supreme and the inferior courts; the abolition of the practice of issuing royal mandates in private causes; and many reforms of legal proceedings. Under Edward I., also, the foundations of the constitution of the kingdom may be considered to have been laid by the new form and the new powers which were then assumed by the parliament. The earliest writs that have been preserved for summoning knights, citizens, and burgesses to parliament, are, as is well known, those that were issued by Simon de Montfort, earl of Leicester, the leader of the barons, in 1264, in the name of king Henry III., who was then a prisoner in his hands. The division of the legislature into two houses, in other words the institution of our present House of Commons, appears likewise to be clearly traceable to the time of Edward I.

EDWARD II., the eldest surviving son of Edward I., was born at Caernarvon, April 25, 1284. In 1289 he was affianced to the young queen of Scotland, who died the following year. Though occasionally accompaning his father in his expeditions, Prince Edward very early began to form those vicious associations which were the chief source of the calamities of his life. Gaveston, his first favourite, was banished by the king in 1297; and again while king Edward was at Lanercost, in February 1307, he found it necessary, with the consent of the parliament there assembled, to issue an order banishing Gaveston for ever from the kingdom, as a corrupter of the prince. On the death of Edward on the 7th of July following, Edward II. was immediately recognised as king.

The new king obeyed his father's injunctions and continued the Scottish war, which was brought to an end in 1323 by a truce for thirteen years. In the meantime he had recalled Gaveston, created him earl of Cornwall, and married him to his niece, the daughter of the countess of Gloucester, and bestowed estates on him with reckless prodigality. Finally, he left him guardian of the realm while he set out for Boulogne, in January, 1308, to marry Isabella, the daughter of the French king, Philip V., to whom he had been affianced ever since the treaty concluded between Philip and his father in 1299. The marriage took place on the 25th of January, and on February 25 the king and queen were crowned at Westminster.

The history of the kingdom for the next twelve years is merely that of a long struggle between the king and his disgusted nobility about this Gaveston. He was banished, recalled, again banished, and again brought back, till he was at length besieged and taken in Scarborough castle, and executed summarily near Warwick, June 19, 1312.

A new favourite soon afterwards began to engross him, Hugh le Despencer, the son of a nobleman of the same name. Upon him Edward now bestowed another daughter of his sister, the countess of Gloucester, in marriage, with large possessions. Another armed insurrection of the barons was the consequence. The Despencers, father and son, were banished; but they returned, and with the king succeeded in defeating the barons, many of whom, and among them the Earl of Lancaster, were executed, and their estates given to the younger Despencer. At this time Charles IV. of France, having seized Guienne and other territories of Edward's in France, Queen Isabella was sent to negotiate with her brother, but while at his court, having been already disgusted with the Despencers, and despising her husband, she found herself among many of the discontented barons who had fled or been exiled. She joined their party against the Despencers, and at the head of the association was Roger de Mortimer. There is no doubt that the connection between

Queen Isabella and Mortimer became eventually a criminal one. The plot against the king was begun by the conspirators contriving to get the heir-apparent, Prince Edward, into their power, in which they succeeded, and who, though only thirteen, was immediately affianced to Philippa, the daughter of the earl of Hainault, who in return agreed to assist her and the confederates with troops and money. Thus supported, she set sail from Dort with a force of 3000 men, under the command of the earl's brother, and landed at Orwell in Suffolk, the 22nd of September, 1326. She was immediately joined by all the most distinguished persons in the kingdom, including even the earl of Kent, the king's own brother. Edward was deserted, and the Despencers were taken and executed. Prince Edward was declared guardian of the kingdom, though the real power was held for a time by Isabella and Mortimer. The king was imprisoned, first at Kenilworth, and then transferred successively to Corfe, Bristol, and Berkeley castles; and was at length murdered, on September 20, 1327, by his keepers, Sir Thomas Gournay and Sir John Maltravers, with detestable brutality.

Edward II. left, by his queen, Isabella of France, two sons, Edward, who succeeded him, and John, born at Eltham, 15th August, 1316, created earl of Cornwall in 1327, who died at Perth in October, 1336; and two daughters, Joanna, married, 12th July, 1328, to Prince David, eldest son of Robert Bruce, afterwards King David II. of Scotland, and Eleanor, who became the wife of Reginald, count of Guelders.

To the reign of Edward II. belongs the memorable event of the suppression in England, as in the other countries of Europe, of the great order of the Knights-Templars.

EDWARD III., king of England, the eldest son of Edward II. and Isabella of France, was born at Windsor, November 13, 1312. In 1325 he went to his mother in France, returned with her to England in September, 1326, was declared guardian or regent of the kingdom about a month afterwards, and was proclaimed king on the deposition of his father, January 25, 1327. [Edward II.]

The government of the kingdom during the king's minority was placed by the parliament in the hands of a regency, but the queen and Mortimer (now created earl of March) from the first assumed the chief management of affairs, monopolized all the power, and must be considered as having been the real authors of the murder of the deposed king.

The king, however, young as he was, did not pass his time in inactivity. He married Philippa of Hainault, January 24, 1328. A few months after his accession he made war upon Robert Bruce, king of Scotland, terminated by a peace in March, 1328, by which it was agreed that David the son of Bruce should marry Joanna, the sister of Edward; and thus settled the dispute between the two countries for the present. In the close of the year 1330, Edward at length determined to make a bold effort to throw off the government of Mortimer: he succeeded; Mortimer was executed, and Isabella was placed in confinement in her house at Risings (where she was detained for the remaining twenty-seven years of her life); and the king took the government into his own hands. In the course of the following year Edward seems to have formed the design of resuming the grand project of his father and his grandfather—the conquest of Scotland, for which purpose he made a tool of Edward Balliol, son of king John. He furnished him with the means of invading Scotland, in which the unexpectedness of the attempt gave him some success, and he was crowned at Scone. He then acknowledged Edward as his liege lord at Roxburgh, in November, 1332; but was almost immediately afterwards driven out of Scotland. Edward then advanced with an army, defeated the Scottish regent, Douglas, at Halidon Hill, on July 19, 1333, and restored Edward Balliol. The nation, however, would not submit. Several devastating campaigns, varied by occasional truces, produced no permanent effect.

From 1336, however, his attention was somewhat withdrawn from Scotland, in order to prosecute the claim he had set up to the crown of France.

We cannot here pursue in detail the progress of the long war that followed. Edward embarked for the continent on the 16th July, 1338, and arrived at Antwerp on the 22nd. Of his allies, the chief were the emperor and the free towns of Flanders, under nominal subjection to their earl, but at this time actually governed by the celebrated James Van Arteveldt. The emperor made him his vicar, and, at Arteveldt's suggestion, he assumed the title of king of France. The first important action that took place was the sea-fight off Sluys, on the 22nd June, 1340, in which the English were completely victorious. It was followed by long truces, which protracted the contest without any decisive events. While prosecuting the war, Edward had taken his son, the Black Prince, who had been born in 1330, with him in his campaign in France in 1346. After reducing Caen, burning St. Germains and St. Cloud, the battle of Crecy was fought, on August 26, in which the main division of the English army was commanded by the prince. Among those who fell was John of Luxemburg, king of Bohemia; he fell by the hand of Prince Edward, who thence assumed his armorial ensign of three ostrich feathers and the motto *Ich Dien* (I serve), and transmitted the badge to all succeeding princes of Wales.

The defeat of the French at Crecy was followed, on October 17, in the same year, by the equally signal defeat of the Scots at the battle of Nevil's Cross, near Durham, in which the greater part of the nobility of Scotland were either taken prisoners or slain, and the king himself, after being wounded, fell into the hands of the English.

Three days after the battle of Crecy, Edward sat down before the town of Calais. It surrendered after a defence of nearly eleven months, and the English king was prevented, by the intercession of Queen Philippa, from making his name infamous for ever by taking the lives of the six burgesses given up to him as the price for which he consented to spare their fellow-citizens. The reduction of Calais was followed by a truce with

France, which lasted till 1355. When the war was renewed, Philip VI. had been dead for five years, and the throne was occupied by his son John. On the 19th of September, 1356, the Black Prince gained the battle of Poictiers, at which the French king was taken prisoner. The kings both of France and Scotland were now in Edward's hands; but neither country was yet subjugated. At last, after many negotiations, David II. was released, in November, 1357, for a ransom of 100,000*l.*, to be discharged in ten yearly payments. King John was released on his parole in 1360, but returned to London on finding that he could not comply with the conditions on which he had received his liberty, and died there April 8, 1364.

King David of Scotland had probably only obtained his liberty by a secret agreement to promote the views of Edward on the independence of his country, for on the death of his wife Joanna, without issue, in 1362, he proposed to the parliament of Scotland the adoption of Lionel, duke of Cambridge, third son of Edward, as his successor. This was unanimously rejected. The death of Edward Balliol a few months afterwards removed the only competitor to the throne, and David entered into an agreement, while on a visit to London, that in default of the king of Scots and his issue male, the king of England for the time being should succeed to the crown of Scotland. One good effect of this was that distinct hostilities between the countries ceased, but the payments towards the ransom were rigorously exacted. In 1361 the prince of Wales had married Joanna, styled the Fair, the daughter of his great uncle the earl of Kent. Soon after his marriage the prince of Wales was raised by his father to the new dignity of prince of Aquitaine and Gascony, and in 1363 he took up his residence, and established a splendid court in that quality, at Bordeaux. Edward's administration of his continental principality was very able and successful, till he became involved in the contest carried on by Pedro, surnamed the Cruel, with his illegitimate brother, Henry of Trastamare, for the crown of Castile. Prince Edward supported the cause of Pedro with great skill and valour, but an illness, caught by his exposure in that climate, gradually undermined his constitution, and at length compelled him, in January, 1371, to return to England. He had just before this lost his eldest son, Edward, a child of six years old. King Edward's consort, Queen Philippa, had died August 15, 1369.

In the meantime affairs in France went on badly. The French general, Duguesclin, drove the English everywhere before him. In the summer of 1372 two expeditions were fitted out from England, the first commanded by the earl of Pembroke, the second by King Edward in person, accompanied by the Black Prince; but both completely failed. At last, in 1374, when he had lost everything that had been secured to him by the treaty of Bretigny, Edward was glad to conclude a truce for three years.

Thus ended the French wars of this king, which had cost England so much blood and treasure. Those which he waged against Scotland equally failed of their object. David II. had died in February, 1371, and was succeeded without opposition by Robert II., the first king of the house of Stuart.

The latter years of Edward's long reign presented in all respects a melancholy contrast to its brilliant commencement. The Black Prince died in his 46th year, on the 8th of June, 1376. He left by his wife Joanna one son, Richard, a child in his tenth year. King Edward, in the weakness of old age, had now for some time given up the entire management of affairs to his second son, the unpopular Duke of Lancaster. Since the death of his queen also he had attached himself with doting fondness to Alice Perers, one of the ladies of her bedchamber, and had excited great public disgust by the excesses to which this folly carried him. The last fortnight of his life he spent at his manor at Shene, now Richmond, attended only by this lady. But even she deserted him on the morning of his death; and no one, save a single priest, was by his bed-side, or even in the house, when he breathed his last, on June 21, 1377, in the 65th year of his age and the 51st of his reign.

Edward III. had by his queen, Philippa of Hainault, seven sons and five daughters. He was succeeded by his grandson Richard II. In this reign began the legislation respecting the poor, by the enactment of the statute of Labourers (23 Edw. III., c. 1), which was followed by several other acts of the same kind, setting a price upon labour as well as upon provisions. Various regulations were made for improving the procedure of the courts and the administration of justice.

EDWARD IV., king of England, was the eldest son of Richard, duke of York, who claimed to be heir to the crown in preference to Henry VI., as descended from Lionel, duke of Clarence, 3rd son of Edward III., while Henry VI. was descended from John of Gaunt, duke of Lancaster, the fourth son of Edward III.

Richard, duke of York, the son of Richard, earl of Cambridge, and of Ann Mortimer, first makes his appearance in public affairs in the end of the year 1435, when he was appointed by Henry VI. to the regency of France on the death of the duke of Bedford. The dominion of France was then fast passing out of the hands of the English. He was recalled in 1437, but was reappointed in July, 1440. On April 29, 1441 (or, according to another account, in September, 1442), his son Edward, earl of March, afterwards Edward IV., was born at Rouen. The duke of York remained in France till after the conclusion of the king's marriage with Margaret of Anjou in 1446; but in 1447 he was recalled, through the influence of the queen. Before this the unpopular government of the queen and the duke of Suffolk, her favourite, had turned men's minds to the claims of the duke of York; and he had already in all probability formed the design of securing the crown for himself and his family. In 1449 he gained much popularity by the able and conciliatory manner in which he suppressed an insurrection in Ireland. In the rising of the people of Kent the next year, their leader, Jack Cade, assumed the name of Mortimer as a sort of title. The king had been mar-

ried for several years without having any children, and it appears to have been generally expected that the duke, by merely waiting for his death, would obtain the crown without any risk or trouble. On the birth of the prince of Wales, however, in October, 1453, it became necessary to adopt another course. After some parliamentary contentions both parties collected their forces, to decide their quarrel by the sword. The civil wars of the Roses then commenced: battles were fought with varying success, and parliaments were summoned to carry out the views of the dominant party. The duke of York however at first only aspired to be regent, and made no claim to the crown until after the battle of Northampton, in June, 1460, in which Edward made his appearance on the scene for the first time. A parliament was then summoned, which met at Westminster on October 2, and the duke delivered by his counsel a written claim to the crown. The question was formally discussed, and it was determined that Henry should remain king during his life, but that the duke of York should be declared his successor. Queen Margaret in the meantime had collected her forces in the north, whither the duke of York repaired to give her battle himself, but was defeated and slain at Wakefield on Dec. 31. Edward, now duke of York, was at Gloucester when he heard of this disaster. He first routed a considerable royal force under the earls of Ormond and Pembroke at Mortimer's Cross, near Hereford, on Feb. 2, 1461. He then set out for London, while the queen, though she had defeated the earl of Warwick on Feb. 17, at St. Albans, and regained possession of the king, retired to the north. Edward entered London on the 28th, and claimed the crown, on March 2, before an assembly of lay and clerical lords, and an assembly of the people. His nomination as king was received with acclamations of assent, and March 4, 1641, was considered as the day of his accession.

The first three years of the reign of Edward IV. were occupied by a prolongation of the contest that raged when he mounted the throne. The Lancastrians were defeated at Towton in Yorkshire, on March 29, 1461; and Queen Margaret's army was routed and dispersed at Hexham, on May 17, 1464. This victory, and the capture of Henry a few days afterwards, put an end to the war. The marriage of the king with Elizabeth Woodville, the young and beautiful widow of Sir Thomas Gray, on May 1, 1464, gave rise to fresh contests. The Earl of Warwick had been sent to negotiate a marriage between Edward and Bona of Savoy, sister-in-law of Louis XI. Warwick was offended by being thus disavowed as it were, and by the prodigality of favours lavished on the poor relations of Edward's new wife. He therefore entered into a close alliance with Margaret, and raised forces against Edward, who was forced to fly to Holland in Oct. 1470. Henry was released and restored to the throne, but the restoration was transient. Edward returned in March 1471, fought and won the battle of Barnet, in which Warwick and his brother, Lord Montague, were slain, and afterwards that of Tewkesbury, in which Margaret and her son were taken prisoners. Margaret was sent to the Tower, and was detained here till she was set at liberty by the treaty of Pecquigny, concluded with France in 1475, the French king paying for her a ransom of 50,000 crowns. Her unfortunate son was brutally put to death by the Dukes of Clarence and Gloucester (the king's brothers). King Henry terminated his days in the Tower about three weeks after; and it has generally been believed that he was also violently taken off.

In June, 1475, Edward, having previously sent a herald to King Louis to summon him to surrender the whole kingdom of France, embarked with a large force, and landed at Calais; but the expedition ended within three months in the treaty of Pecquigny, or Amiens, already mentioned. By one of the articles it was agreed that the dauphin, Charles, should marry Elizabeth, the king of England's eldest daughter; and Louis also engaged to pay Edward an annuity of 50,000 crowns a year as long as they both lived. This was a supply obtained independently of parliament and the country. He was driven indeed to many other shifts and illegal methods, as well as this, to raise money for his wasteful debaucheries and extravagant expenditure on the mistresses, favourites, and others that ministered to his personal pleasures. In 1478 he caused his brother George, Duke of Clarence, to be put to death. In 1482 Louis contracted the dauphin in another quarter. Edward, incensed in the highest degree, was preparing to avenge this affront by a new descent upon France, when he was suddenly cut off by a fever, April 9, 1483, after a reign of twenty-two years.

Edward IV. had by his wife, Elizabeth, three sons; Edward, who succeeded him; Richard, duke of York, born in 1474; and George, duke of Bedford, who died in infancy; and seven daughters. He had also two illegitimate children.

Edward IV. has the reputation of having been zealous and impartial in the administration of justice; but with the exception of some statutes abridging the ancient jurisdiction of sheriffs, and transferring part of the powers of those officers to the quarter-sessions, no important innovations were made in the law during this reign. The reduction of the law and its practice to a better form is considered to have made great progress in the latter part of the reign of Henry VI., and in that of Edward IV. This reign is illustrious as being that in which the art of printing was introduced into England. [CAXTON.]

EDWARD V., the eldest son of Edward IV., was born November 4, 1470. His reign is reckoned from April 9, 1483, the day of his father's decease; but he never was a king in more than name. The public transactions of his reign all belong properly to the history of his uncle, Richard III. Richard obtained possession of the persons of both the young princes, and having placed them in the Tower, preparatory, as was pretended, to Edward being crowned, he caused himself to be declared king in his stead, on an assertion of the illegitimacy of the children. June 26 is reckoned the commencement of his reign, and the close of that of his nephew. After

this Edward and his brother were seen no more. They are generally believed to have been m e away with by Richard's orders, the agents being Sir Robert Brackenbury, Sir James Tyrrel, Miles Forest, and John Dighton. The young princes were smothered in their beds, and buried in the Tower, where, on July 17, 1674, in making some alterations, the labourers found, covered with a heap of stones at the foot of an old pair of stairs, a quantity of partially consumed bones, which on examination appeared to be those of two boys of the ages of the two princes. They were removed by order of Charles II. to Henry VII's chapel in Westminster Abbey, where the inscription placed over them recites that they appeared by undoubted indications to be those of Edward V. and his brother.

EDWARD VI., the only son of Henry VIII. who survived him, was born at Hampton Court, October 12, 1537. His mother, Queen Jane Seymour, died on the twelfth day after giving him birth. When six years old he was committed to the care of Dr. (afterwards Sir Anthony) Cooke, and Mr. (afterwards Sir John) Cheke, the former of whom appears to have undertaken his instruction in philosophy and divinity, the latter in Greek and Latin. The prince made great proficiency under these able masters. On the death of Henry VIII., Jan. 1547, Edward was brought from Hatfield to the Tower, and proclaimed king on Jan. 31. His father had appointed certain executors to exercise the powers of the government during the minority of his son, of whom the chief was the king's maternal uncle, Edward Seymour, earl of Hertford, who was elected by the rest their president, and either received from them in this character, or assumed of his own authority, the titles of governor of his majesty, lord protector of all his realms, and lieutenant-general of all his armies. He was also created duke of Somerset, lord high treasurer, and made earl marshal for life.

One of the first acts of Somerset's administration was an expedition into Scotland, undertaken with the object of compelling the government of that country to fulfil the treaty entered into with Henry VIII. in 1543 for the marriage of the young Queen Mary to Edward. The English forces won the battle of Pinkey, fought September 10, 1547, and had other military successes, but they wholly failed in their object. Mary was conveyed to France, and there married to the dauphin, afterwards Francis II.

Meanwhile great changes were effected in the domestic state of England. Under Somerset and the new king, measures were taken to establish Protestantism as the religion of the state. Even before the meeting of parliament, the practice of reading the service in English was adopted in the royal chapel, and a visitation, appointed by the council, removed the images from the churches throughout the kingdom. The parliament met in November, when bills were passed allowing the cup to the laity, giving the nomination of bishops to the king, and enacting that all processes in the ecclesiastical courts should run in the king's name. By the parliament of 1548, the use of the Book of Common Prayer was established, and all laws prohibiting spiritual persons to marry were declared void.

Somerset's brother, Lord Seymour, who had at first partaken of the favours showered on his family, became suspected of intriguing against Somerset's supremacy. His crime does not appear to have gone farther than this, but Somerset represented it as high treason. He was attainted, convicted unanimously by the House of Lords without any evidence or hearing him in his own defence; his sentence received the royal assent, and he was beheaded on Tower Hill, March 20, 1549.

In the summer of this year Kett's rebellion, as it is called, took place. The insurgents were not put down without much fighting and bloodshed; and many of the rebels were executed after the suppression of the commotions. The institution of lords lieutenants of counties arose out of these disturbances.

A few months after these events brought Somerset's domination to a close. John Dudley, formerly Viscount Lisle, and now Earl of Warwick, had acquired great influence, while Somerset had become unpopular, by his treatment of his brother, his lavish expenditure (out of the spoils, as it was said, of the church) on his new palace of Somerset House, and certain violations both of public and of private rights of which he was accused of having been guilty in procuring the space and the materials for that magnificent structure. A cry was also raised against him on account of a proposition he had made in the council for a peace with France, on the condition of resigning Boulogne for a sum of money. He soon found himself nearly deserted by all his supporters; and after a few days the king himself was obliged to sanction the vote for his deposition passed by the majority of the council. On Oct. 14, 1549, he was taken into custody, and sent to the Tower. From this moment Warwick, though without his title of protector, enjoyed his power. An apparent reconciliation was effected between Warwick (now created duke of Northumberland) and Somerset, but it did not shelter the overthrown protector. He was brought to trial Dec. 1, 1551, before the high steward and a committee of the House of Lords, on charges both of high treason and of felony: he was convicted of the latter crime; and was executed on Tower Hill, January 22, 1552.

Under Northumberland the government continued to be conducted in all respects nearly as it had heretofore been. In July, 1550, a treaty with France was signed at Angers, by which it was agreed that the king of England should receive in marriage Elizabeth, the daughter of the king of France. Meanwhile at home the matter of religion continued to be treated by the new government much as it had been by the old. No Roman Catholics were put to death during this reign, though many were fined, imprisoned, and otherwise not capitally punished: but on May 2, 1550, an unfortunate fanatic, Joan Becher, commonly called Joan of Kent, was burnt for certain opinions considered to be neither Catholic nor

Protestant, in conformity with a warrant extorted by Cranmer from the king about a year before; and several prelates were deprived of their preferments for non-conformity. The forty-two articles of belief, afterwards reduced to thirty-three, were promulgated in the early part of this year.

In April, 1552, Edward was attacked by small-pox, and, although he recovered from that disease, the debility in which it left him produced other complaints, which ere long began to assume an alarming appearance. Northumberland now lost no time in arranging his plans for bringing the crown into his own family; and induced Edward to make a settlement of the crown on his son's wife, the Lady Jane Grey, the daughter of the duchess of Suffolk, who was the grand-daughter of Henry VII., to the exclusion of his sisters Mary and Elizabeth, as having been both declared illegitimate by Parliament. The settlement was drawn up and signed by the king, and subscribed by fifteen lords of the council and nine of the judges. Edward sank rapidly after this, and lived only till the evening of July 6, when he expired at Greenwich. His death however was concealed for two days, and it was not till the 9th that Lady Jane Grey was proclaimed.

EDWARD the Black Prince. [EDWARD III.]

EDWARDS, RICHARD, was born in Somersetshire in 1523. He was educated at Oxford, in Corpus Christi College, where he was successively a scholar and fellow: he took his degree of Master of Arts in 1547. In the beginning of Elizabeth's reign he was made one of the gentlemen of the Queen's Chapel, and master of the children there, a post which engaged him in theatrical management. He is first heard of as a dramatic poet in the year 1564–5; and his death is said to have taken place in 1566. Although he is highly commended for his dramatic works by Puttenham, we only know of two. One of these, 'Palamon and Arcite,' was never printed, and is lost: the other, 'The excellent comedie of two of the moste faithfullest freendes, Damon and Pithias,' was printed in black-letter, 4to., in 1571; again, in black-letter, 4to., 1582, and is included in the first volume of Dodsley's 'Old Plays.' Edwards also wrote some of the poems inserted in 'The Paradise of Dainty Devises,' 1575.

EDWARDS, JONATHAN, was born at East Windsor, Connecticut, United States, Oct. 5, 1703. He was the son of Timothy Edwards, minister of East Windsor, by whom he was carefully educated until he was sent to Yale College, Newhaven, at the age of thirteen. He took his degree of B.A. in Sept. 1720, and staid two years afterwards preparing for the ministry. In August 1722, he went to New York, having been invited by the English Presbyterians in that city to come among them as their minister. He left New York in April 1723, and returned home. In September of the same year he took his M.A. degree, and shortly after he was chosen tutor of Yale College. Two years after he accepted an invitation from Northampton, in Massachusetts, to assist his maternal grandfather, the Rev. Solomon Stoddard, in the ministry; and, having resigned his tutorship, he was ordained colleague to his grandfather at Northampton in February, 1727, in the twenty-fourth year of his age. Shortly afterwards he married.

He remained at Northampton, first as assistant to his grandfather, and, after his grandfather's death, as sole minister, for twenty-three years. On the 22nd of June, 1750, Edwards was dismissed ignominiously from his charge at Northampton, he having offended a large and influential part of his congregation by some severity of discipline, and by a refusal to admit 'unconverted' persons, or (in other words) persons who either could or would not say that they had really embraced Christianity, to a participation in the sacrament. After several years spent in disputes and attempts at reconciliation, his dismissal was put to the vote among the members of his congregation, when more than two hundred voted for his dismissal, and only twenty against it.

In August, 1751, Edwards went as missionary to the Indians at Stockbridge, a town in the western part of Massachusetts Bay. In 1757 he was chosen, without any solicitation on his part, and much to his surprise, president of Princeton College, New Jersey. Having after some deliberation accepted the appointment, he went to Princeton in January, 1758, and was installed president. He died of the small-pox on the 22nd of the following March.

Edwards's chief works are—1, 'A Treatise concerning Religious Affections;' 2, 'An Inquiry into the modern prevailing notions respecting that Freedom of the Will which is supposed to be essential to moral Agency, Virtue and Vice, Reward and Punishment, Praise and Blame;' 3, 'The Great Christian Doctrine of Original Sin defended; containing a Reply to the Objections of Dr. John Taylor;' 4, 'The History of Redemption;' 5, 'A Dissertation concerning the End for which God created the World;' and 6, 'A Dissertation concerning the True Nature of Christian Virtue.' The last three works were published after his death.

The best and most complete edition of Edwards's works is that edited by President Dwight, in 10 volumes. There is also an edition in 8 volumes, which was published in London, 1817.

EDWARDS, BRYAN, was born at Westbury, in Wiltshire, May 21, 1743. Family distresses caused him, towards the end of 1759, to go to an uncle in Jamaica. It appears that he succeeded to his uncle's estate, became a wealthy merchant, and an active member of the House of Assembly. In 1791 he went to St. Domingo, on the breaking out of the insurrection of the negroes, and acquired the materials for his 'Historical Survey' of that island, published in 1797. Afterwards he removed to England, where, in 1796, we find him M.P. for Grampound, which he represented until his death, July 15, 1800.

His principal work, the 'History, Civil and Ecclesiastic, of the British Colonies in the West Indies,' was published in 1793. It is a valuable contribution to our literature. The edition of 1819 contains also the history of St. Domingo.

EDWIN, king of Northumbria, was the son of Ella, who reigned in that kingdom from about A.D. 559 to 589. On the death of Ella, the throne

was usurped by his sister's husband, Edilfrid, and when Edwin, then only three years old, was protected by Cadvan, king of North Wales, Edilfrid made war upon Cadvan, defeated him near Chester, and it is said massacred 1200 monks of the monastery of Bangor, who had been assembled on a neighbouring hill to pray for the success of Cadvan. Edwin was then forced to wander for several years, till at length he found refuge with Redwald, king of the East Angles and bretwalda of England. A war ensued with Edilfrid, who was defeated and slain in a battle fought in Nottinghamshire in 617, and Edwin ascended the throne of Northumbria. His valour and abilities eventually acquired for him great power. Bede affirms that his sovereignty extended over all the English, excepting only the people of Kent, and that he also subjected to his dominions all the Britons, and the Islands of Man and Anglesey. The event for which his reign in Northumbria is chiefly memorable is the introduction of Christianity into that kingdom. The legend is related at great length by Bede in the second book of his History; but it would rather appear to have been owing to the influence of Edwin's second wife, Edilberga, the daughter of Ethelbert, king of Kent, and of Paulinus, whom she had brought from her father's court. Paulinus was made bishop of Northumbria, his residence being established at York, and the archiepiscopal dignity was soon after conferred upon him by Pope Honorius. Edwin however did not long survive these events. The Mercians, under their king, Penda, revolted against the supremacy claimed by Northumbria; and a war which arose in consequence was ended on the 12th of October, 633, by a battle fought at Hatfield, in Yorkshire, in which Edwin was defeated, and lost at once his kingdom and his life.

EDWY, called the Fair, king of the Anglo-Saxons, was the eldest of the two sons of Edmund I., but he and his brother Edgar were set aside on their father's death, on account of their youth, in favour of their uncle Edred. On Edred's death, in 955, Edwy became king, and his brother appears to have been at the same time appointed subregulus of Mercia. The whole of his reign was a series of commotions, promoted by Dunstan and the clergy, who made an instrument of Edgar, his brother. The tragical story of his wife Elgiva, as commonly told, is familiar to most readers. Edwy is said to have married this lady, though they were related within the prohibited degrees. She was seized by Archbishop Odo, Dunstan's friend, conveyed to Ireland, her face seared with a red-hot iron, and at length, venturing to return to England, was put to death by cutting the sinews of her legs with swords.

Edwy died in 958. It is difficult to say whether the expressions of the chroniclers imply that he was murdered, or only that he died of a broken heart. Edgar now became sole king.

EECKHOUT, GERBRANT VANDER, born at Amsterdam in 1621, was a disciple of Rembrandt, whose manner of designing, colouring, and pencilling he imitated with much felicity. His principal employment was for portraits, and his masterpiece was the portrait of his own father. He was equally successful in historical subjects. His composition is rich and judicious, and his distribution of light and shade excellent. He died in 1674.

EECKHOUT, ANTHONY VANDER, was born at Brussels in 1656. It is not known under whom he studied; but he went to Italy with his brother-in-law, Lewis Deyster, a very eminent artist, and painted in conjunction with him during his residence abroad; Deyster painting the figures, and Eeckhout the fruit and flowers: yet there was such a harmony in their style of colouring and touch, that their works appear to be all by one hand. Though he was received with great marks of distinction on his return to Brussels, he left in order to return to Italy, but chancing to stop at Lisbon, he was induced to remain, and in about two years married a young lady of quality and large fortune. This excited the envy of some miscreant, and he was shot while taking an airing in his carriage.

EECLOO. [FLANDERS, EAST.]

EEL. [MURÆNIDÆ.]

EFFERVESCENCE is the rapid disengagement of a gas, which takes place in a liquid in consequence of chemical action and decomposition.

EFFLORESCENCE is the property by which certain salts containing water of crystallization lose it, and become opaque by exposure to the air.

EFT. The terms *Eft* and *Newt* are applied almost indiscriminately to all the species of lizards which are found in the British Islands. The word lizard is evidently formed from the Latin *lacerta*. Eft and Newt are the old Saxon words. Eft seems to be more usually applied to the land animals, one of the most common of which is the *Zootoca vivipara*, and another less common, the *Lacerta agilis*. [VARANIDÆ.] Newt is more commonly applied to the animals which inhabit ponds, wet ditches, and other damp places, such as the *Triton cristatus* (the Great Water Newt), *Lissotriton punctatus* (the Common Smooth Newt), and other species, which belong to the family SALAMANDRIDÆ.

EGBERT, styled the Great, king of the West Saxons, though his immediate parentage is doubtful, was an undoubted descendant of Cerdic, and the representative, if not the only remaining male descendant, of that founder of the royal house of Wessex. When Beohrtric, or Brihtric, became king in 786, Egbert, then very young, or his friends for him, had claimed the throne, but unsuccessfully; and he resided first with Offa, king of Mercia, and then with Charlemagne, at whose court he was living on the death of Brihtric in 800. He was then recalled, and by the unanimous vote of the witenagemote appointed to the vacant throne.

At the date of Egbert's accession the Saxon states in England were reduced to three independent sovereignties, Northumbria, Mercia, and Wessex. The conquests and the able rule of Offa however had raised Mercia to a decided preeminence over Wessex; and Cenwulf, the king at the time of Egbert's accession, was well qualified to wield the sceptre of Offa. For the first nine years of his reign Egbert seems not to have drawn

his sword. He then, between 809 and 814, reduced to at least temporary submission all Cornwall, Devonshire, and North Wales. After the death of Cenwulf, in 819, he took advantage of a revolt of the East Angles against the Mercian sovereignty, and, after having defeated the Mercians, Essex and Kent submitted to his dominion. In 827, on occasion of another revolt of the East Angles, probably fomented by himself, he again marched against the Mercians; but their king, Wiglaf, submitted to hold his crown as a tributary, and East Anglia was annexed to Wessex. Northumbria also soon afterwards submitted, and Egbert became bretwalda, being the eighth Saxon king who is stated to have acquired this dignity.

In the last year of the reign of Egbert several descents of the Danes or northern pirates were made upon the English coasts; but in 835, when they landed in Cornwall, Egbert gave them a most decisive overthrow. He died the next year, after a reign of thirty-seven years and seven months, leaving his dominions between Ethelwulf his son and Athelstan.

EGEON, Risso's name for a genus of macrourous decapods [CRUSTACEA] whose characters generally are like those of the shrimps (*Crangon*). 'Linn. Trans.,' and 'Malac. Brit.' The term *Egeon*, it must be observed, is used by Denys de Montefort for one of the nummulites, *Nummulina*, D'Orbigny.

EGER (*Cheb*), a town in Bohemia, is situated on a rocky eminence on the right bank of the river Eger, in 50° 5′ N. lat., 12° 24′ E. long., and has 10,000 inhabitants. There are several interesting buildings in the town, among which are the old burg or citadel, now dismantled, a fine church, 2 monasteries, and the barracks. Eger has likewise a gymnasium, several schools, two hospitals, an infirmary, and an orphan asylum. The apartment in the burgomaster's residence in which the celebrated Austrian general, Wallenstein, was assassinated in the year 1634, is still shown. The manufactures consist of woollens and kerseymeres, cottons, leather, soap, and alum. About 3 miles to the north of Eger are the saline hot-wells of Franzensbrunnen, which are much frequented in summer, and rendered attractive by the beauty of the surrounding scenery.

EGERIA, a genus of brachyurous decapod crustaceans [CRUSTACEA], established by Leach, and thus characterised:—External antennæ short, and inserted on the sides of the rostrum, having their second joint much shorter than their first. External jaw feet having their third articulation straight on the internal border, and terminated by a point. Claws delicate, linear, double the length of body in the males, nearly equalling it in the females, and much shorter in both sexes than the rest of the feet, which are very slender, those of the first pair being five times the length of the body. Carapace triangular, tuberculated, and spinous, terminated by a rather short rostrum, which is bifid, with diverging points. Eyes much larger than their peduncle. Orbits having a double fissure on their superior border. Example, *Egeon Indica*. Locality, the Indian Seas.

M. De Roissy applies the term Egeria to a genus of *Conchifers* which Rang considers identical with *Galuthea*, Brug., and *Potamophilus*, Sowerby.

EGERTON, FRANCIS. [BRIDGEWATER, DUKE OF.]

EGG PLANT, the *Solanum esculentum* of botanists, is a native of the north of Africa, and was introduced into this country in the year 1597.

It grows to the height of two or two and a half feet, has leaves of an ovate form, which, as well as the stem, are prickly and downy; its flowers are generally of a violet colour, and its fruit is a large ovate or globose berry resembling a hen's egg, but sometimes larger, whence the name of Egg-Plant, which has been given to it.

There are many varieties of this plant, of which two only are commonly cultivated in gardens, namely the small white and the large purple. They are raised from seed, which should be sown early in spring, in light soil on a hot-bed, and treated in every respect like a tender annual. Of the two varieties above named, which by some botanists are regarded as distinct species, that with white fruit is small, and rather an object of curiosity than of use; the other, with purple fruit, which sometimes attains a pound weight, is a favourite article of food in hot countries. Under the name of Brinjal and Begom it is well known in India, and by that of Aubergine in France.

EGHAM. [SURREY.]

EGINHARDT, a native of Austrasia, or East France, was secretary to Charlemagne, and afterwards to his successor, Louis le Débonnaire. His wife Emma, or Imma, is said to have been a daughter of Charlemagne, and a curious story is related of their amours previous to their marriage, but the whole seems to be an invention. Eginhardt, as well as his wife, spent their latter years in convents. Eginhardt became abbot of Fontenelle, and afterwards, in 827, founded an abbey called Seligenstadt. He was living in 848, but the time of his death is uncertain. Eginhardt wrote 'Vita et Conversatio gloriosissimi Imperatoris Karoli Regis Magni,' divided into two parts, one relating to the public and the other to the private life of his hero. He wrote other historical works. His 'Epistolæ,' which are found in Duchesne's 'Historiæ Francorum Scriptores,' show Eginhardt's character to great advantage, and afford considerable information on the manners of that period.

EGLANTINE, the old English name of the Sweet Briar Rose; *aiglantier* and *eglantier* in French. Milton misapplies the word to the Honeysuckle in the following lines:—

> Through the Sweet Briar, or the Vine,
> Or the twisted Eglantine.

EGMONT, count of Lamoral, prince of Gavre, was born in 1552, in Amsterdam. He distinguished himself as a soldier, under Philip II., in the battles of St. Quentin and Gravelingen (1557, 1558), and became the popular favourite of his countrymen, the Flemings, in their disputes with the regents Margaret of Parma and the duke of Alba. The latter caused Egmont to be accused of high treason, and, upon no other evidence save

that of his accusers, he was condemned and executed, June 5, 1548, at the same time with his friend Count Horn. [ALBA, DUKE OF.]

EGRA, a locality in Bohemia, famous for fossil Infusoria, especially *Campylodiscus*, which comprises nearly the whole of the white pulverulent mass. (Mantell, *Medals of Creation*, i. p. 223.)

EGREMONT. [CUMBERLAND.]

EGRIPOS. [EUBŒA.]

EGYPT and EGYPTIANS. Egypt is within the limits of Africa. It is bounded N. by the Mediterranean, E. by the Arabian desert and the Red Sea, and W. by the Libyan desert. Its boundary S. is at the rapids or cataracts of Assouan, the ancient Syene. But the political limits of Egypt extend further south along the valley of the Nile into Nubia. The length of Egypt from the cataracts of Assouan, 24° 8′ N. lat., to the most northern point of the Delta on the Mediterranean, 31° 25′, measures about 500 English miles in a straight line. The breadth includes very little more than the valley of the Nile. Egypt may be treated under these four great divisions: 1, The valley of the Nile; 2, The Delta; 3, The western desert and the oases therein inclosed; 4, the Eastern country towards the Red Sea.

1. *Valley of the Nile.* The Nile, coming from Nubia, runs through a deep and narrow valley, sunk between two ridges of rocky hills, which rise in some places more than 1000 feet above the level of the river. The breadth of the valley varies considerably, but it is seldom more than 10 miles, and in many places it is not two, including the breadth of the river, which varies from 2000 to 4000 feet. In its course within Egypt the Nile contains numerous islands. Northward from Selseleh the cultivable land on the left bank is broader than that on the right. The course of the river is generally nearly north. A canal, called the Bahr Joussouf, runs nearly parallel to the Nile, on its western side, from Farshout to the Delta, irrigating in its passage part of the district of Faioum. North of Benisouef, the western range, the height of which becomes less and less as it advances northwards, again approaches the river near Sakkarah, and forms in the neighbourhood of Jizeh a kind of natural terrace, on which the great pyramids stand. The stone of this ridge is limestone, sandstone, slate, and quartz. The eastern ridge is more abrupt than the western, and approaches closer to the river: it contains the granite quarries which furnished material for the great works of the ancient Egyptians.

2. *The Delta.* The Nile, issuing from the valley a few miles north of Cairo, enters the wide low plain which, from its triangular form and its resemblance to the letter Δ, received from the Greeks the name of the Delta. The river divides into two branches, that of Rosetta or old Canopic, and that of the Damiat or Phatnitic. The figure of the Delta is now determined by these two branches, although the cultivated plain known by that name extends considerably beyond to the east and west, as far as the sandy desert on each side. There were formerly other outlets for the Nile, named the Pelusiac, the Tanitic, the Sebennytic, and the Mendesian, but these have become in great measure choked up. There are many salt lakes in the Delta, which communicate with the Mediterranean; among which are lakes Menzaleh, Bourlos, Etko, Aboukir, and Mareótis. The greatest breadth of the Delta is about eighty miles from east to west; its length from the bifurcation of the river to the sea is about ninety. The interior of the country, which is covered with fields, orchards, and plantations, exhibits different aspects according to the various seasons. The rise of the Nile, occasioned by the periodical rains of Central Africa, begins in June about the summer solstice, and it continues to increase till September, overflowing the lowlands along its course. The Delta then looks like an immense marsh, interspersed with numerous islands, with villages, towns, and plantations of trees just above the water. The inundations, having remained stationary for a few days, begin to subside, and about the end of November most of the fields are left dry, and covered with a fresh layer of rich brown slime: this is the time when the lands are put under culture. From thence till the next inundation, the Delta goes through the alternatives of a delightful spring and a fiercely hot summer. Very little rain falls in Egypt. The Delta is supposed to have been once a great æstuary, which has been filled up by sedimentary deposits from the Nile. The soil of the Delta and the bed of the Nile have risen seven or eight feet since the time of Ptolemy.

3. *The Western or Libyan Desert.*—The nominal limits of Egypt along the sea-coast west of Alexandria are the mountains at Akabah el Soloum, about 25° E. long., where the nominal limits of the pachalik of Tripoli begin, but this extensive tract of country is occupied by independent tribes of nomadic Arabs. Inland to the south is the oasis of Siwah or of Ammon, which is now considered as within the political limits of Egypt, and pays tribute to it. Several other oases occur in this desert, such as the Wah el Bahryeh, the Wah el Hayz, the Wah el Farafreh, the Wah el Dakhleh, and the Great Oasis or Wah el Khargeh. All these oases are beautiful green spots, fertilized by springs, and each of them has a village and inhabitants in proportion to the size of the oasis.

4. *The Eastern Country.*—The large tract between the valley of the Nile and the Red Sea is a mountainous region, which, although generally rocky and barren, is intersected by numerous wadys or ravines, fertilized by springs and clothed with vegetation. Several Arab tribes divide among themselves the whole tract, which cannot therefore be called properly a desert. In ancient times the roads leading from the valley of the Nile to the shores of the Red Sea passed by regular stations, and villages and towns with a resident population. Mines of various metals and quarries of porpyhry and other valuable stones are scattered among the mountains, and were once regularly worked. At present, the only fixed habitations are at the port of Cosseir, and at the Coptic

monasteries of St. Anthony and St. Paul. Cosseir is about 90 miles from the Nile, at the eastern extremity of the Wady Arabah, which is enclosed by two ranges of mountains called Jebel Kelalla. A range called Jebel Ghrarib, about 28° 15′ N. lat., has peaks 6000 feet high. Many remains of antiquity are scattered over this district.

Ancient History.—Egypt was one of the countries earliest civilized, and brought under a fixed social and political system. The first king mentioned as having reigned over that country is Menes or Men, who is supposed to have lived above 2000 years B.C., about the time fixed by biblical chronologists for the foundation of the kingdom of Assyria by Nimrod, and corresponding also with the æra of the Chinese emperor Yao, with whom the historical period of China begins. All inquiries concerning the history of nations previous to this epoch are mere speculations unsupported by evidence. From the time of Menes, something like a chronological series has been made out by Champollion, Wilkinson, and other Egyptian archæologists, partly from the list of Manetho and partly from the Phonetic inscriptions on the monuments of the country. The immediate successors of Menes are unknown till we come to Suphis and his brother or brothers. Abraham visited Egypt about 1920 B.C., and we have the testimony of Scripture as to the high and flourishing state of that country at that early period. The Scripture calls the kings of Egypt indiscriminately Pharaohs, which is now ascertained to be not the proper name of the individual monarchs, but a prefix like that of Cæsar and Augustus given to the Roman emperors. The word Phra in the Egyptian language meant the sun. Little or nothing is known of several successive dynasties except the names of some of the kings, until we come to Osirtesen I. of the 16th dynasty, who began to reign about 1740 B.C. Very few monuments remain of a date prior to his reign. The obelisk of Heliopolis bears the name of Osirtesen. The 16th dynasty, which reigned from 1812 to 1650 B.C., was from Lower Egypt, where the kings of this dynasty resided. About 1706 B.C., Joseph, and afterwards Jacob and his family, came to Egypt, where their descendants settled and multiplied in Lower Egypt. Egypt was then the granary of the neighbouring nations, and apparently the centre of a great caravan trade carried on by the Arabs or Ishmaelites. The 17th dynasty lasted from 1651 to 1575 B.C.; and the 18th lasted 340 years. For about 100 years, great part of Egypt was occupied by a race called Hyksos or Shepherd Kings, who are supposed to have come from Assyria, and who destroyed many of the ancient monuments of Egypt: they were expelled by Thothmes I., of the 18th dynasty. The Exodus of the Israelites (1491 B.C.) is supposed to have occurred during the reign of Thothmes III. After Amunoph II. came Remeses II., or *Sesostris* (about 1350 B.C.), one of the most warlike and celebrated of the Egyptian kings. Remeses II. was succeeded by his son Amenophis, with whom terminated the 18th dynasty. The 19th lasted from 1270 to 1170 B.C. Of the 20th and 21st very little is known. The 22nd

was began by Sesonchis, the Shishak of the Bible, who plundered the temple of Jerusalem in the time of Rehoboam. Osorkon II., in 908 B.C., began the 23rd dynasty; the 24th commenced in 812, and the 25th about a century later. The 26th dynasty followed a period of anarchy and revolution: it was began by Psamatic I. in 650, and ended with Psammenitus, in 525 B.C. Then succeeded the 27th or Persian dynnaty, which was commenced by Cambyses, and lasted till 414 B.C.: during this period Egypt was a province of Persia. The Egyptians succeeded in having kings of their own, forming the 28th and 29th dynasties, from 414 till 340 B.C. Egypt then again became a Persian province; and a few years afterwards the Macedonian dynasty of the Ptolemies commenced its prosperous career of nearly 300 years, which was terminated by the Roman conquest of Egypt in 30 B.C.

There is no doubt that, during this long period of ancient Egyptian history, this singular nation had attained a high degree of refinement and luxury at a time when the whole western world was still involved in barbarism. This high state of material civilization was attained under a system of institutions which resembles in some respects those of the Hindoos. It was a monarchy based upon an all-powerful hierarchy. The inhabitants were divided into hereditary castes, the first of which consisted of the priests, who filled the chief offices of the state. They were the depositaries and the expounders of the law and the religion of the country: they were judges, physicians, architects. Their sacred books, like their temples, were not open to the vulgar. They had a language, or at least a writing, peculiar to themselves. The king himself, if not of their caste, was adopted into it, was initiated into its mysteries, and became bound by its regulations. The priests were exempt from all duties, and a large portion of land was set apart for their maintenance. They were subject to certain strict regulations.

The soldiers formed the second caste. Their arms were the bow, sword, battle-axe, shield, knife or dagger, spear, club, and sling. Their besieging engines were the battering-ram, the testudo, and the scaling ladder. They had a military music, consisting of a kind of drum, cymbals, pipe, trumpet, and other instruments. The military caste was held in high repute and enjoyed great privileges. Each soldier was allowed a certain measure of land, exempt from every charge, which he either cultivated himself when not on active service, or let to husbandmen or farmers.

The husbandmen formed another class, which was next in rank, as agriculture was highly esteemed among the Egyptians. They made use of the plough and other implements. They had various breeds of large cattle, sheep, goats, pigs, and a quantity of poultry reared chiefly by artificial means. The peasants appear to have been divided into hundreds, each with a peculiar banner.

The next class was that of the artificers and tradesmen, who lived in the towns. The progress made by the Egyptians in the mechanical arts is evident from their monuments, paintings, and

sculptures, in which the various handicrafts are represented. The mines of gold, copper, iron, and lead, which are in the mountains between the Nile and the Red Sea, were worked at a very remote date under the early Pharaohs. The Egyptians were acquainted also with the arts of gilding, pottery, glass-making, weaving, dyeing, and tanning.

The last class or caste included pastors or herdsmen, poulterers, fishermen, and servants. The herdsmen and shepherds appear to have been held in peculiar contempt among them. Besides servants, they had a number of slaves, both black and white. Fish was an article of common food, except to the priests. Wine of native growth was used by the rich, and a kind of beer was the drink of the poor.

The Egyptians had made some progress in *astronomy*, though much discussion has arisen as to its real value. Their mythology was originally symbolical, but afterwards degenerated into gross idolatry. They had considerable knowledge of geometry. Their skill in navigation was limited, never reaching a pitch equal to that of many neighbouring nations. Their money consisted in rings of silver and gold, the value of which was ascertained by weight, and its purity by fire. The population of Egypt was estimated by Diodorus at seven millions, and by Josephus at *seven* millions and a half, besides 300,000 in Alexandria alone. The country was divided under the Pharaohs into 36 governments, each of which was subdivided into districts or toparchies. Under the heads ABOUSAMBOUL, EGYPTIAN ARCHITECTURE, PYRAMIDS, &c., many of the ancient monuments of Egypt are described.

Modern History.—*Passing* over the ages during which Egypt was a province of the Roman Empire, we begin the modern history of Egypt at the Mohammedan conquest. Under the Caliphate of Omar, Amer ebn el As invaded Egypt, A.D. 638, and the whole of Egypt as far as Assouan was soon reduced to a province of the Caliphate, the capital of which was Fostat. In A.D. 868, Ahmed ebn e' Tooloon, governor of Egypt for the Abbaside Caliphs, usurped the sovereignty of the country and founded the dynasty of the Tooloonides, which lasted till 906, when the Caliphs retook Egypt. Two further usurpations and reconquests took place before the year 970, when the Fatmieh or Fatemides took possession of Egypt. El Moez, who styled himself Caliph, built Misr el Kahirah, (Cairo), where he fixed his residence. From that time till 1171, the Fatemide Caliphs reigned over Egypt, independent of and rivals to the Abbaside Caliphs of Bagdad. The Kurd Salah e' Deen Yoosef ebn Eyoob succeeded to the Fatemides in 1171, and founded the dynasty of the Eyoobites, which lasted till 1250. Then succeeded the Baharite dynasty, from 1250 till 1261, when the Memlook Baybers made himself Sultan of Egypt, put an end to the Caliphate of Asia, and extended his conquests as far as and over part of Armenia. His descendants reigned till 1382, maintained possession of Syria as far as the Euphrates, and encouraged agriculture and the arts. In 1382 Dowlet el Memeleek el Borgéëh, a Circassian slave, took possession of the throne, and founded the dynasty of the Borgéëh, or Circassian Memlooks. which lasted till 1517, when Selim I., the Ottoman sultan, conquered Egypt. He established a sort of Memlook republic, or rather aristocracy, consisting of 24 beys or governors, under a pasha at Cairo; the whole subject to the Sultan. This government lasted till 1798, but with frequent attempts on the part of the Memlooks (or Mamelukes) to shake off the Turkish supremacy. Bonaparte took and held the country from 1798 to 1801, when the English conquered and restored it to its former owner. Mehemet Ali, who was pasha in 1811, put an end to the Memlook dynasty by slaughtering nearly the whole of the beys in that year. Little as can be said in favour of Mehemet Ali's motives, but it is admitted that Egypt suffered more under the Memlooks than during any other period of its history. Egypt *remained till nearly the* present time under the rule of this extraordinary man, who threw off the supremacy of Turkey, and introduced many European arts and customs into Egypt. He has fallen into mental imbecility, and the government is now (1848) in the hands of his son, Ibrahim Pacha.

Present State.—This country is commonly divided by geographers into three regions, namely, Bahari, or Maritime, or Lower Egypt; Vostani, or Middle Egypt; and Said, or Upper Egypt. But the administrative division of the country is by provinces, or by prefectships, of which there are fifteen in Lower Egypt, and ten in Middle and Upper Egypt together. The provinces are—Masr, or Cairo, Kelioub, Belbeys, Chibeh, Mit Ghamer, Mansourah, Damietta, Mehallet el Kebir, Tantah, Melig, Menouf, Negileh, Fouah, Damanhour, and Alexandria, in Lower Egypt; and Jizeh, Benisouef, Atfyh, Faioum, Minyeh, Manfalout, Siout, Girgeh, Keneh, and Esneh, in Middle and Upper Egypt.

The chief towns are noticed under their respective heads, ALEXANDRIA, DAMIETTA, KAHIRA, ROSETTA, &c.

The whole of the cultivable land of Egypt, in the valley of the Nile and the Delta, is reckoned at 17,000 square miles. The resident population is estimated by Lane at about 2,000,000, thus comprised:—1,750,000 are Mohammedan Egyptians, including the fellahs or peasants and the townspeople; 150,000 are Copts or Christian Egyptians; 10,000 are Osmanlees, or Turks and Albanians, as yet the ruling race; 5000 Syrians, 5000 Greeks, 5000 Jews, 2000 Armenians, and about 70,000 black slaves, Nubians, Moghrebins, &c. In this calculation the nomadic Arabs of the neighbouring deserts, whose number cannot be ascertained, are not included. The language of the natives is Arabic; but Turkish is still the language of the government. The fellahs of Egypt have lost much of their original Arabian character; they are become proverbially tame and servile, and are despised by the neighbouring Bedouins, who never give them their daughters in marriage. The townspeople may be considered as having attained as high a degree of civilization as any in the East. The men are generally well proportioned and muscular, their height about

five feet eight; the women beautifully formed. Their complexion in Cairo and the northern provinces is clear, though yellowish, and their skin soft. The lower classes are darker and coarser. The people of Middle Egypt are of a more tawny colour, and those of the southern provinces are of a deep bronze complexion. Their countenance in general is of a fine oval form; the nose is straight though rather thick, the lips rather full, the eyes black and brilliant, the beard commonly black and curly, but scanty.

The climate of Egypt, during the greater part of the year, is salubrious. The khamseen, or hot south wind, which blows in April and May, is oppressive and unhealthy. The summer heat is seldom very oppressive, being accompanied by a refreshing northerly breeze, and the air being extremely dry. This dryness however causes an excessive quantity of dust, which is very annoying. The climate of Upper Egypt, though hotter, is more healthy than that of the lower country. The houses of the wealthier classes in the principal towns are substantially built, roomy, and commodious, but the dwellings of the lower orders, especially of the peasants, are of a very mean description, being mostly built of unbaked bricks, cemented with mud. Many of them are mere hovels. Most of the villages of Egypt are situated upon eminences of rubbish, the materials of former buildings, and thus rise a few feet above the reach of the inundation: they are surrounded by palm-trees.

The agricultural produce of Egypt consists of the following winter plants, which are sown when the inundation has ceased, and reaped in three or four months after: wheat, barley, beans, peas, lentils, vetches, lupins, clover, flax, coleseed, lettuce, hemp, cummin, coriander, poppy, tobacco, watermelons, and cucumbers; and of the following summer plants, which are raised by artificial irrigation by means of water-wheels and other machinery: doorah, Indian corn, onions, millet, henneh, sugar-cane, cotton, coffee, indigo, madder. Rice and numerous fruits are also cultivated. Mehemet Ali has pensioned off the landed proprietors, and seized the land himself; so that the poor fellah farmers are his immediate tenants, and a wretched life they seem to lead.

The government of Mehemet Ali had its light and dark sides. He administered impartial justice, discouraged barbarous punishments, and fostered many manufacturing and educational establishments. But his ambition and the difficulties of his situation obliged him to resort to two violent expedients, an enormous taxation and an oppressive conscription. The pretended legislative assembly sitting at Cairo is a mere fiction. The government of Egypt is still absolute in the strictest sense of the word, though the present pasha governs according to forms and regulations which his father, Mehemet Ali, established. Many of the subordinate agents of the government in the provinces still exercise occasional acts of capricious tyranny, which seldom reach their master's ears, but whenever they do he is not slow in punishing the offenders and redressing the grievances of the oppressed. The dominions embrace a wide extent of country; and since the overland passage to India has been established through Egypt, they attract a large share of attention from the European governments.

The commodities imported from Egypt into Great Britain in 1845 comprised 73,000 qrs. of peas and beans; 124,000 cwts. of flax and hemp; 5000 cwts. of gum arabic; 6000 lbs. of opium, 11,000 lbs. of senna; 2,300 lbs. of waste silk; 11,000,000 lbs. of cotton wool, and small quantities of many other articles. The British and Irish commodities exported to Egypt in 1845, comprised —apparel, 25,000*l.*; books, 19,000*l.*; coals, 19,000*l.*; cotton goods, 135,000*l.*: metals and hardware, 17,000*l.*; machinery, 14,000*l.*; jewellery and watches, 18,000*l.*; and other goods, making an aggregate value of 291,850*l.* The tonnage of vessels which enter and leave the ports of Egypt annually, is now about 100,000 tons in European trade, and 600,000 tons in coasting trade in the Levant. In 1841, the number of vessels which entered Alexandria was 1381. The imports at Alexandria, from 1836 to 1840, averaged about 2,500,000*l.* annually; and the exports about 1,500,000*l.* Of the whole exports from Egypt, about one-third are sent to Great Britain, the greatest article of value being cotton.

(Andreossi; Wilkinson; Young; Champollion; Rosellini; Belzoni; *Egyptian Antiquities*, in *Library of Entertaining Knowledge;* Lane's *Modern Egyptians;* Miss Martineau's *Eastern Life*, &c.; the Chevalier Bunsen's *Egypt; Parliamentary Papers.*)

EGYPTIAN ARCHITECTURE. Till comparatively recent times hardly anything was known of Egyptian architecture, or the edifices executed in it, with the exception of the pyramids; for previously to the French expedition to Egypt, at the close of the last century, no satisfactory delineations had been taken of the temples and their details; but merely such views as were calculated to convey some general idea of their enormous masses and colossal grandeur. Hence it has been regarded as wonderful for the vastness of its structures, and the prodigious solidity of the materials and mode of construction employed, but at the same time as utterly devoid of beauty in its forms and proportions. But when the eye, so long habituated to Grecian and modern architecture, becomes more accustomed to it, and the first prejudice is overcome, it will be found to possess much elegance in some of its forms, together with powerful and legitimate architectural effects.

Though Egyptian architecture has much in common with that of Greece, it exhibits, together with what constitutes the affinity between them, many striking points of difference. While they agree in having columns supporting a horizontal epistylium, or entablature, and in the general proportions resulting from such a disposition, they disagree in almost all their other subordinate particulars. In Egyptian buildings the profile of the columns is vertical, or nearly so, while that of the walls is sloped; thus producing the same degree of contrast between the two which is observable in the Greek Doric, although the mode adopted in the one case is just the reverse of that pursued in the

other. Egyptian columns are generally cylindrical, but there is occasionally a slight difference between the upper and lower diameter; or the shaft is cinctured at intervals by bands consisting of three or more rings encircling it, and thereby increasing the diameter in those parts. In addition to this species of ornament, the shaft is variously decorated in other respects, the spaces between the bands being sometimes sculptured with hieroglyphics; at others, reeded, that is, its surface divided into a series of upright mouldings, or staves, so as to have the appearance of a bundle of smaller pillars bound together. The diversity observable in Egyptian columns is so great that it is impossible to specify all their varieties. Egyptian columns have rarely any distinct base, seldom more than a circular plinth; but they have frequently an ornamental footing, which differs however from a base in being contracted instead of expanded below. It may be described as shaped like the calyx of a flower, the resemblance to which is increased by its being sculptured into some forms of foliage, so that the shaft appears to be set in and rise out of a plant. Of this description are the bases of the columns of the temple at Latópolis or Esneh. The most usual form adopted for capitals is bell-shaped, that is, resembling a bell reversed, or rather the bell and petals of a flower, with a rim bending downwards, which is sometimes quite circular, thereby giving the whole somewhat the appearance of a mushroom; at others, jagged, the circumference being divided into a number of convex curves forming so many distinct petals.

The Egyptian entablature is so far from displaying anything like the same variety as the columns, that it is nearly uniformly the same in buildings which differ very much from each other in regard to their columns. More frequently than not the epistylium was enriched with sculpture and hieroglyphics; which circumstance alone constitutes a great difference between the practice of the Egyptians and that of the Greeks. Another peculiarity is, that the epistylium was included within the convex moulding or torus carried up at the angles of the building, and then returned horizontally along the front, owing to which the architrave itself (epistylium) appears to be returned downwards, like that of a door or window. The cornice consists of little more than a deep cove, enriched with sculpture; a form peculiarly adapted for effect in a climate like that of Egypt, as it not only casts a bold shadow but receives a strong reflected light.

With the cornice the building terminated, for the roof being a flat terrace, there was no indication of roof; consequently Egyptian architecture is entirely destitute of what are such expressive and highly ornamental features in that of Greece, namely, the pediment, antefixæ, and ridge-tiles. Another thing peculiar to Egyptian buildings is the frequent use in the external porticoes to temples of intercolumnar walls, or screens, that is, walls built between the columns and carried up half their height; thereby giving to the open part of the intercolumns above them somewhat the appearance of windows. Like every other part of

the front in the same edifice, these walls are decorated with sculpture and hieroglyphics; for the Egyptians were very profuse of that species of embellishment, not confining it to particular situations, as the Greeks did, namely to the pediment, frieze, and inner frieze behind the columns, along the walls of the cella, but extending it over the entire surface, in compartments forming tier above tier. These architectural sculptures were generally in very low relief, and some of them also occasionally in intaglio, or hollowed into the surface instead of projecting from it. In addition to this species of enrichment may be added that of colours and gilding, especially in the interior and upon beams and ceilings.

Having thus given some notion of the elementary parts and features of Egyptian temples, we proceed to describe their general plan and distribution, selecting by way of explanatory illustration the ground plan of the temple at Edfu, or Apollinópolis Magna, one of the largest in Egypt. The temple is placed within an enclosure, forming a court in front of it, surrounded on three of its sides by colonnades; and the entrance to this court was through a colossal doorway, or propylæum, placed between two enormous pyramidal towers, or moles, covered with colossal figures in sculpture. These vast masses of structure, which rose considerably higher than the temple itself, had the usual cornice, and likewise the torus moulding running up their angles. These moles may almost be said to be solid, for the chambers and staircases which they contained were little else than empty spaces left in the mass. Within the court the colonnades were pycnostyle, which seems to have been the usual mode of intercolumniation adopted by the Egyptians, the columns being seldom more than a diameter and a half from each other, except in the centre of a portico, where there there was generally a doorway between the columns, the lower part of the other intercolumns being walled up, as mentioned before.

Some particulars remain yet to be noticed in respect to the temple at Edfu. Instead of being level, the court has a slight ascent towards the front of the temple, not however in one continued slope, but in a succession of low and very wide steps, each step being the width of a column and intercolumn. The columns round the court are not so lofty as those of the portico, whereby the temple itself acquired greater dignity. The capitals of these columns are bell-shaped, but not uniform as to design; while those of the pillars in the hypostyle hall have quadrilateral capitals with the four Isis' faces, similar to those at Denderah. This hall, again, is not so lofty as the outer one or portico, but the height is proportioned to its other dimensions.

In Egyptian architecture, doorways are conspicuous and important features, more particularly where they occur as distinct parts of the design, in the form of propyla, sometimes standing quite insulated, after the manner of arches or gat ways, but more usually placed between and connecting two pyramidal moles that rise to great elevation above the propylon itself; consequently such entrance is both lower and narrower than the parts

attached to it. Some idea may be given of the imposing magnitude of such doorways or propyla, by stating that the one at Edfu measures 74 feet to its summit, and 51 to that of the aperture, which gives a depth of 23 feet, or nearly one-third of the whole height, for the lintel and cornice.

The magnificence of these propylæa was greatly enhanced by colossal statues or obelisks, in some instances both, placed on either side of the entrance. Besides which there were sometimes two or even more propylæa and courts preceding the temple, which were in their turn preceded by avenues of gigantic sphinxes, or crio-sphinxes (that is, sphinxes with rams' heads). There are likewise instances of avenues of columns crossing the courts in a line from the entrance. The remains at Luxor furnish an example of the kind, where, after the first court (which has a double peristyle), there is a second with a double range of columns extending down it, that are 11½ feet in diameter and 56 high, and beyond this was a *third court*, flanked by colonnades, consisting of double rows of pillars.

As to the pyramids, though interesting in themselves, they are structures so very peculiar as to have little connection with the architecture of the country, being, when considered with reference to it, little more than uniform and simple though enormous masses. Their shape is so familiar to every one that it requires no description, but may be defined as square in plan and triangular in section, the four sides being so many triangles united so as to terminate in a point; and as the height is much less than the width of the base, each side consitutes nearly an equilateral triangle.

EGYPTIAN BEAN, a name sometimes given to the bean-like fruits of *Nelumbium speciosum*, from the notion that they were the beans which the disciples of Pythagoras were forbidden to eat.

EHRENBREITSTEIN, a township on the right bank of the Rhine, in the circle of Coblenz, in the Prussian Rhein-Provinz. It contains one town and 8 villages, with about 6400 inhabitants. The town called Thal-Ehrenbreitstein, is situated on the right bank of the Rhine, at the foot of a precipitous height 772 feet high, opposite to Coblenz, in 50° 23′ N. lat., 7° 36′ E. long., and has 2400 inhabitants. Above the town stands the fortress of Ehrenbreitstein, which, with three forts on adjacent heights, commands the mouth of the Moselle and the approaches from the Lower Rhine. The road up to it from the town, which is about 1200 paces long, is strongly fortified. To the 'Cavalier,' or highest point of this formidable stronghold, strangers are not admitted; but the prospects from other points are extensive and beautiful. This fortress was taken in 1799 by the French, who demolished all the works, but they have been since rebuilt with considerable additions. [COBLENZ.]

EHRETIA CEÆ, a small natural order of exogenous plants, consisting of shrubs or trees inhabiting the warmer countries of the world, and having rough leaves and monopetalous regular flowers. The common Heliotrope is the most generally known representation of *Ehretiaceæ*, forming however the type of a sectional division, characterized by the fruit being dry, not succulent.

EICHHORN, JOHANN GOTTFRIED, one of the most learned and distinguished scholars of Germany, was born in 1752, at Dorrenzimmern, in the principality of Hohenlohe Oeringen. His first place was that of rector of the school at Ohrdruf, in the principality of Gotha. Having applied with great success to the study of the oriental languages, he obtained in 1775 a professor's chair in the university of Jena, where he continued thirteen years, giving instruction in Hebrew, Arabic, and other languages. He was made in 1783 a court councillor by the duke of Saxe Weimar. In 1788 he was appointed to the professorship previously held by Michaelis in the university of Göttingen, of which institution he continued a very distinguished ornament during the remainder of his life, as professor of oriental and biblical literature.

His reputation was equally high as a proficient in oriental, classical, and scriptural antiquities; in philosophical criticism; in the history of nations, and of ancient and modern literature and science; and in universal bibliology. He was made in 1811 a doctor of divinity; in 1813 the directorship of the Royal Scientific Society of Göttingen was conferred on him, and the office of prorector of that university; in 1819 he was appointed privy councillor of justice for the kingdom of Hanover (Geheimer Justizrath). He died in 1827, on the 25th of June, at the age of 75. These few incidents, which appear to be all which are published, verify the trite observation that the secluded lives of students furnish but scanty materials for biographical memoirs. His works are very numerous, and most of them of great value. His works on biblical criticism show great learning. By his superior knowledge of Oriental antiquities, and by his bold mode of thinking, Eichhorn established a new system of scriptural explication, in which he displays a degree of learned and philosophical scepticism much beyond that of his predecessor Michaelis. He denies all supernatural revelation to the Hebrew prophets, believing them to have been clever and experienced persons, who, from their peculiar abilities, were likely to foresee political and other events. He examines, questions, and rejects the authenticity of several books of the Old Testament, and of some of the epistles in the New, and asserts generally that miraculous appearances, visions, voices, &c., are explainable by the laws of nature and the principles of human physiology and psychology, and that supernatural communications are chiefly referable to the mysterious traditions and superstitious notions common to all people in a state of ignorance and barbarism. His theory of the origin of the canonical gospels, which he considers as compilations from anterior documents, has been adopted by many subsequent critics. (See Dr. Schleiermacher's work on the Gospels.) Many of the sceptical positions of Eichhorn have been attacked in Germany by the anti-rationalist class of divines.

EICHSTÄDT is a handsome town in the Bavarian circle of Regen, situated in a valley on the left bank of the Altmühl, which is crossed by four

bridges. The town, which is the seat of a bishop, is walled round, has four suburbs, and a population of about 7800. It has an ecclesiastical seminary, a grammar-school, an hospital, an orphan asylum, a public library, and other literary and charitable institutions, a cathedral, and four other churches. The old castle of Willibaldsburg, which was the residence of the former prince-bishops of Eichstädt, stands on a height above the town. Eugene Beauharnois, step-son of Napoleon, got the title of prince of Eichstädt from this place. The town manufactures woollens, earthenware, beer, ironware, &c., and has quarries in the neighbourhood.

EIDER-DUCK. [FULIGULINÆ.]

EIDOGRAPH, from the Greek words εἶδος, a form, and γεάφω, draw, is an instrument invented in the year 1821, by the late Professor Wallace of Edinburgh, and described in the 'Transactions of the Royal Society of Edinburgh,' vol. xiii. It is a species of pantograph, and, like the latter, it is used for the purpose of copying plans or other drawings on the same or on different scales.

EIGHTH (in music), the octave or eighth note of the diatonic scale.

EILENBURG. [MERSEBURG.]

EIMBECK. [GEUSENHAGEN.]

EISENACH, a principality in the centre of Germany, forming the western portion of the grand duchy of SAXE-WEIMAR-EISENACH.

EISENACH, the chief town of the principality of Eisenach, in the duchy of Saxe-Weimar-Eisenach, is situated at the confluence of the Hörsel and Nessel, which unite immediately north of the town, in 50° 58′ N. lat., 10° 18′ E. long., and has 10,000 inhabitants. The celebrated Wartburg, a mountain fastness, commands it on the south. The town is surrounded by walls, has five gates, is well built, and has broad, clean, well-paved streets. The grand-ducal palace is a large and handsome edifice. Among the public buildings and institutions are—five churches; a gymnasium, with an extensive library; a training school; an academy for young men designed for the profession of superintendents of woods and forests; a school of design; a free-school; a house of correction and orphan asylum; two hospitals; an infirmary; and several philanthropic associations. The chief manufactures are woollens, cottons, linens, soap, white lead, meerschaum pipes, leather, and carpets. The little chapel in the Wartburg in which Luther frequently preached in 1521, on his return from the Diet at Worms, with its altar-piece, a fine carving in wood representing the Entombment of Christ, and the cell which Luther inhabited, have been carefully preserved in the same state as when he used them. In the ancient portion of the Wartburg are the Baronial Hall (*Rittersaal*), in which the German Minnesänger used to hold their poetic contests; and the Armoury, in which are several curious relics and beautiful suits of armour.

EISENBURG. [HUNGARY.]

EISENSTADT. [HUNGARY.]

EISLEBEN. [MERSEBURG.]

EISTEDDFOD, from the Welsh *eistedd*, to sit, a meeting or assembly. This term was more especially used as the name for the session of the bards and minstrels which was held in Wales for many centuries. [BARD.]

EJECTMENT is the name of an action at law, by which a party entitled to the immediate possession of land or other corporeal hereditaments may recover that possession from the party wrongfully withholding it.

Since the enactment of the 3rd and 4th Wm. IV., c. 27, for the Limitation of Actions and Suits, &c., it has become the only mode of trying the title to lands and tenements.

The remedy by ejectment is founded almost entirely upon a succession of legal fictions.

Originally this action was brought by any person having a lease for years of land, &c., to repair an injury done him by dispossession; but gradually it became the means of indirectly bringing in question the title to the lands, which was thus collaterally tried with the supposed trespass. For this purpose it was necessary that the claimant should enter upon the lands in order to empower him to constitute a lessee for years who would be capable of receiving the injury of dispossession. A lease for a term of years is therefore stated in the declaration to have been made by the party claiming title to the plaintiff, who is generally a fictitious person. It is also stated that the lessee, in consequence of the demise to him, entered into the premises, and that the defendant, who is also a fictitious person, and called the *casual ejector*, entered thereupon and ousted the plaintiff, for which ouster the plaintiff brings his action.

Under the declaration is a notice, in terms professing to be written by the casual ejector to the tenant in possession of the premises, advising him to appear in court at a certain time and defend his title; otherwise he, the casual ejector, will suffer judgment to be had against him, by which means the actual tenant would be turned out of possession. The declaration, as well as the notice, is then served upon the tenant in possession of the premises, who has thus an opportunity of defending his title. If he omits to do so within a limited time, he is supposed to have no right; and upon judgment being obtained against the casual ejector, the real occupier is turned out of possession by the sheriff.

If the tenant apply to be made a defendant, he is allowed, upon condition that he enters into a rule of court, to confess at the trial of the cause four of five requisites for the maintenance of the plaintiff's action—the lease of the lessor, the entry of the plaintiff, the ouster by the tenant himself, and the possession by the tenant. These requisites (except in certain cases, as of vacant possession, &c.) are wholly fictitious; and if the defendant should put the plaintiff to the proof of them, he would of course be nonsuited at the trial; but the stipulated confession of lease, entry, and ouster, being made, the case then rests upon the merits of the title only. The cause goes to trial under the name of the fictitious lessee on the demise of the lessor, who is the person claiming title against the defendant.

The lessor is bound to make out on the trial his title to the premises; and if he do so, judg-

ment is given for the nominal plaintiff, and a writ of possession goes to the sheriff to deliver up the possession to him, under which process it is in fact delivered to his lessor, the real claimant. If it appears that the person claiming title to the lands has no right of entry, that is, no right to the immediate possession, he cannot maintain this action.

A mortgagee may maintain an action of ejectment against the mortgagor to gain possession of the mortgaged premises without giving any notice, unless the mortgagor is protected by the covenant for quiet enjoyment until default. He may also eject the lessee, to whom the mortgagor has made a lease subsequent to the mortgage, without giving him notice to quit. Where the right of the tenant to retain the possession has ceased by effluxion of time, by a legal notice to quit, or by the commission of an act of forfeiture, a landlord may bring an ejectment against his tenant.

The time within which an action of ejectment may now be brought is regulated by the 3 and 4 Wm. IV. cap. 27, which enacts that no person shall bring an action to recover any land or rent (the meaning of which terms is explained by the first section of the act) but within twenty years next after his right to bring such action, or that of the person through whom he claims, shall have first accrued. The third section fixes the time at which the right shall be deemed to have first accrued.

(Runnington *On Ejectment;* Adams *On Ejectment;* Blackstone's *Com.*)

EKATERINBURG or YEKATERINBURG, the most important town, though not the capital of the government of Perm, in the western part of Asiatic Russia, stands on the Iset, in 56° 50′ N. lat., 60° 41′ E. long., and has 16,000 inhabitants. The town, part of which is built on an eastern slope of the Ural mountains, is fortified and regularly constructed: the streets are straight, but unpaved. The greater part of the houses are of wood, but there are many handsome stone buildings; the chief of them form three sides of a square, the fourth side of which is the right bank of the Iset: this range of buildings is composed of the Mining Department (for Ekaterinburg is the seat of administration for the Ural mines), a museum of mineralogy, a public library, an excellent chemical laboratory, an imperial mint, works for amalgamating metals and polishing precious stones, &c. A handsome bridge unites both quarters of the town. Besides 5 churches, there are a Greek monastery, a public school, a German school, a large bazaar, a magazine for grain, and a house of correction. As Ekaterinburg lies on the high road leading from European Russia to Siberia, it is a place of brisk trade. In the neighbourhood lie the gold mines of Beresoff and the iron mines of Nivianak.

EKATERINOSLAF, a southern province of Russia in Europe, is bounded N. by Poltava, Kharkov or the Ukraine, and Voronesh; E. by the territory of the Don-Cossacks; S. by the sea of Azof and the government of Taurida; and W. by Kherson. There is an isolated district of this province, of which Taganrog is the chief town, lying at the north-eastern extremity of the sea of Azof, and separated from the remainder of Ekaterinoslaf by the territory of the Don-Cossacks. The area of the province is 23,514 square miles, and the population in 1846 was 864,100. Upwards of two-thirds of this area are an open steppe, destitute of wood, and adapted to pasturage only. This is peculiarly the case with that large tract which is situated east of the Dnieper. The districts west of that river are more fertile, and are skirted by a range of hills which run northwards from Alexandrofsk along the Dnieper. Here it is principally that the arable lands of Ekaterinoslaf, occupying about one-fourth of the soil, are situated. The whole extent of the woods and forests does not exceed 256,000 acres. The principal river is the DNIEPER. The Don skirts the isolated part of Ekaterinoslaf only at its mouth; but its tributary, the Donecz, forms part of the north-eastern boundary of the province. There are several salt lakes and swamps. The climate is mild, and the winter is of short duration. The quantity of corn grown does not suffice for the consumption. Hemp, flax, peas, beans, lentils, vegetables, melons, and fruit, are cultivated. The grape ripens, and some wine is made; the mulberry and walnut are extensively grown. The forests do not furnish sufficient timber or fuel; and straw, rushes, and dung, are substituted for the latter. The chief kinds of trees in the forests west of the Dnieper are the oak, linden, and poplar. Cattle breeding is carried on upon an extended scale in the steppes. The stock of horses, horned cattle, goats, and swine, is immense; and numerous flocks of merino sheep are also kept. Cheese and butter are made of sheep's milk. Bees are carefully tended, and vast quantities of honey and wax are obtained. The culture of the silk-worm is a favourite pursuit, and this branch of industry is rapidly on the increase. Wild animals and game are plentiful. Under this head may be enumerated the jerboa, wolf, fox, buffalo, antelope-goat, wild cat, tiger-martin, musk-rat, pelican, wild duck, and partridge. The fisheries in the rivers Dnieper, Don, Kalmius, and the Sea of Azof, are very productive. Large quantities of caviare are exported. Among the mineral products of the province are lake salt, granite, chalk, clay, and bog-iron. The garnet is occasionally met with.

The population is a mixed race, composed of Russians, Cossacks, Servians, Walaks, Magyars, Albanians, Greeks, Armenians, Tartars, Germans, Mohammedans, and Jews. The religion of the majority is Russo-Greek. The province is in the see of the archbishop of Ekaterinoslaf, Cherson, and Taurida.

Ekaterinoslaf is divided into the seven circles named from the chief town in each, the most important of which are—EKATERINOSLAF; Alexandrofsk, on the left bank of the Dnieper (about 4000 inhabitants); Novo-Moskofsk, on the Samara (3000); Bakmut, on the Bakmuta, a feeder of the Donecz (about 4500 inhabitants); near it are Tartar tombs and three lines of old fortifications; a coal mine has lately been discovered near this town: TAGANROG, on the Sea of Azof (about

14,000); Mariupol, at the efflux of the Kalmius into the Sea of Azof, with about 3500 inhabitants; Naktschivan, on the right bank of the Don, which is the seat of an Armenian patriarch, and has a population of 12,000 and manufactures of silk, woollens, and brandy; and St. Dmitria Rostofskaye, a fortress at the confluence of the Temernik and Don (about 2500).

The manufactures of Ekaterinoslaf, which are of little importance, are woollen cloths, silk, tallow and candles, leather, and beer. The number of brandy distilleries is very great. The principal articles exported are fish, wool, tallow, and other animal products.

EKATERINOSLAF, the capital of the province, founded in 1787, stands on the right bank and just above the falls of the Dnieper, in 48° 27′ N. lat., 35° 2′ E. long., and has 9000 inhabitants. The town is close to the foot of a mountain, and is built according to a regular plan. The streets are broad and straight. There are three churches, a gymnasium, and an ecclesiastical seminary, an imperial manufacture of woollens, and several hospitals. The town is the seat of an archbishop, and has an ecclesiastical college and a gymnasium. Silk stockings and woollen cloth are made, and some retail trade is carried on.

ELÆAGNA'CEÆ, a small natural order of Apetalous Exogens. The fruit is soft, succulent, and would be eatable if it were not for its dryness and insipidity. In a few cases, when it is more than usually juicy and acidulated, it is actually considered an excellent fruit. *Elæagnus Hortensis* and *Orientalis* bear a brown fruit, about the size of an olive, which is brought to market in Persia under the name of Zinzeyd: in quality it is like a jujube. The red drupes of *Elæagnus conferta*, the large olive-shaped ones of *E. arborea*, and the pale orange-coloured ones of *E. triflora*, are in like manner eaten in India. The only species found wild in Great Britain is the *Hippophae rhamnoides*, a spiny shrub, found growing on cliffs near the sea; its fruit, when the acidity is sufficiently covered by sugar, becomes a rather pleasant preserve. *Elæagnus angustifolia*, a native of the eastern parts of Europe, is one of the most fragrant of all plants. Its dull yellow flowers, hardly remarked among the leaves, fill the atmosphere with a delicious perfume, the source of which is not readily discovered by the passer by.

ELÆIS, a genus of palms, so named from *elaia*, the olive-tree, because an oil is yielded by the fruit of its principal if not only species. This is *Elæis Guineensis*, or Oil-Palm, common all along the western coast of Africa.

The oil is obtained by bruising the fleshy part of the fruit (and not the kernel, as sometimes stated), and subjecting the bruised paste to boiling water in wooden morturs. An oil of an orange-yellow colour separates, which concretes when cool to the consistence of butter, and has when fresh the smell of violets or of the root of the Florentine iris, with a very slightly sweetish taste. This oil is used by the Africans in cookery and for anointing the body. It forms a considerable article of commerce to Europe, where it is chiefly employed in perfumery and medicine. *Cocos butyracea* (which is referred by Kunth to the genus *elæis*) is considered by the Edinburgh College to be the plant which yields Palm-Oil.

ELÆOCARPA'CEÆ, a natural order of chiefly Indian trees, having a strong botanical resemblance to our European Lindens. The species have not yet received sufficient attention from botanists, especially the few known in South America; and it is doubtful whether this order will not be eventually combined with *Tiliaceæ*.

In the Indian genera the nuts, cleared of the soft pulp or flesh that covers them, are curiously sculptured, and being bony, and taking a fine polish, they are frequently set in gold and strung into necklaces. The nuts of *Ganitrus sphæricus*, a middle-sized tree, common in various parts of India, as well as the Malay Archipelago, and those of *Monócera tuberculata*, from the forests of Travancore, are what are principally used for this purpose. The fruits of *Elæocarpus serratus*, which are very much like olives when ripe, are said by Roxburgh to be pickled or dried and used in their curries by the natives of India. *Elæocarpus cyaneus* has pure white beautifully fringed petals, and is one of the most ornamental plants of New Holland.

ELÆODENDRON. A genus of plants belonging to the natural order *Celastraceæ*. The species are small trees with opposite entire glabrous leaves. *E. glaucum* is a small tree about fourteen feet in height, and is a native of Ceylon and Coromandel. The tree has been introduced into Great Britain from Ceylon under the name of Ceylon-tea. It has leaves like those of the tea-plant, but it does not appear to be used as a substitute for that plant. *E. Roxburghii* is a native of the mountainous parts of India. It possesses powerful astringent properties, but is not used as an internal medicine. The fruit of all the species resembles that of the olive, and hence the generic name. *E. orientale* is a native of the Mauritius and Madagascar, where it is called by the French *Bois d'Olive*. *E. Argam* contains in its fruit a fixed oil like the common olive, which is used by the Moors for the same purpose as olive oil is used in Europe.

ELÆOLITE (*Fettstein*) occurs in amorphous masses. Colour dark green, bluish gray, or grayish or brownish red. Hardness 5·5 to 5·0. Translucent. Specific gravity 2·54 to 2·62. It is found in Norway. Silica, 44·00; alumina, 34·00; soda, 16·50; peroxide of iron, 4·00; lime, 0·12.

ELAGABALUS, called also HELIOGABALUS, was the grandson of Mæsa, sister to the empress Julia, the wife of Septimius Severus. Mæsa had two daughters, Sæmis, or Semiramis, the mother of Varius Avitus Bassianus, afterwards called Elagabalus, who was reported to be the illegitimate son of Caracalla; and Mammæa, mother of Alexander Severus. Elagabalus was born at Antioch, A.D. 204. Mæsa placed him, when five years of age, in the temple of the Sun at Emesa, to be educated by the priests; and through her influence he was made, while yet a boy, high priest of the Sun. That divinity was called in Syria Elagabal, which name the boy

assumed. After the death of Macrinus, the successor of Caracalla, Elagabalus was proclaimed emperor, A.D. 218. Elagabalus having entered Antioch, wrote a letter to the senate professing to take for his model Marcus Aurelius Antoninus, and he assumed that emperor's name. The senate acknowledged him, and he set off for Rome, where he arrived in the following year. His career of debauchery, extravagance, and cruelty, lasted the remaining three years of his reign, and the disgusting details are given by Lampridius, Herodianus, and Dion. He surrounded himself with gladiators, actors, and other base favourites. He married several wives, among others a vestal. The imperial palace became a scene of debauch and open prostitution. Elagabalus being attached to the superstitions of the East, raised a temple on the Palatine to the Syrian god whose name he bore, and plundered the temples of the Roman gods to enrich his own. His grandmother Mæsa, seeing his folly, thought of conciliating the Romans by associating with him as Cæsar his younger cousin, Alexander Severus, who soon became a favourite with the people. Elagabalus, who had consented to the association, became jealous of his cousin, and wished to deprive him of his honours, but he could not obtain the consent of the senate. His next measure was to spread the report of Alexander's death, which produced an insurrection among the prætorians, and Elagabalus having repaired to their camp to quell the mutiny, was murdered, together with his mother and favourites, and his body was thrown into the Tiber, March 222. He was succeeded by Alexander Severus. The coins of Elagabalus bear the names of Marcus Aurelius Antoninus, like those of Caracalla, with which they are often confounded.

ELEIN. [OLEIN.]

ELA'SMODUS, a genus of fossil Placoid fishes, from the London clay. (Egerton.)

ELASTICITY. When the form of a body is affected by the pressure of another extraneous to it, the reacting force by which it sustains or tends to remove that pressure is its elasticity. The cause of elasticity belongs to the theory of molecularity, its effects in aggregate masses to mechanics.

The equilibrium of the molecules of solid bodies is almost completely dependent on their own mutual actions and on the quantity of heat. When heat is applied to a solid elastic body, that is, when its temperature is raised, the particles seek a different position of equilibrium more remote from each other than before. But while this heat is much below that necessary for friction, or for destroying the fibrous formation of organized matter, the stability of the removable particles is but little affected, and experiment shows that there is scarcely any change of elasticity. In fluids the compressibility obtains a greater range, while in gases, where no countervailing force of attraction is sensible, the increase of temperature is accompanied by a proportional increase of elastic force.

Amongst bodies whose elasticity is very apparent, we may enumerate glass, ivory, caoutchouc, sponges, and fibrous substances, as beams, muscles, and artificial webs, some gums, steel, and all the gases and vapours. In gases and vapours its effects may be produced to any extent, but they are limited in solids by their softness and facility of fusion, as in wax, lead, &c.; by their absorption of moisture, as in clay, feathers, catgut, straw; or by their friability, as in glass, dry resins, and copper or iron which have been exposed to a stream of ammoniacal gas.

When a uniform elastic string is suspended vertically it will be stretched by its own weight. The tension varies from point to point, and is everywhere proportional to the portion of the string of which it supports the weight. If y be a portion of the stretched string corresponding to a portion x of the same unstretched, and $y + \Delta y$, $x + \Delta x$, another corresponding pair of portions greater than the former, and a the whole length of the string in its natural state, the extension $\Delta y - \Delta x$ of the element Δx is proportional to the weight of the remaining portion $a - x - \Delta x$ of the string; hence if g denote the weight of a unit of the string, and e the index of elasticity peculiar to the substance, we have, using differentials for differences, and rejecting dx^2, $\frac{dy}{dx} - 1 = ge(a-x)$; therefore, integrating, $y - x = ge(ax - \frac{x^2}{2})$, to which no arbitrary constant need be added, because y commences at the same point with x: if we now make $x = a$, we find that $g\frac{e}{2} \cdot a^2$ expresses the extension of the entire string.

Similar principles may be easily applied to determine the form of an elastic spring suspended from two points, and stretched by its own weight; but in this case the curve, which differs from the common catenary, cannot be considered as accurately determined without taking into account the elasticity of inflexion as well as that of extension. The mere mathematical problem may be seen in most mechanical treatises. (Whewell's 'Mechanics'; Poisson, 'Mécanique.' Consult also Lagrange, 'Mec. Analytique', for the method of introducing the condition of elasticity in a system at rest.)

When an elastic spring, fixed at one end, is bent by a weight or other force applied at a given point, the elasticity of inflexion acts normally at each point of the curve, and is some function of the curvature at that point. It is usual to suppose it proportional to the simple curvature. On this supposition the figure of an elastic lamina in a vertical position, fixed at its lower point and bent by a small weight applied at the top, may be determined. This problem has been treated by Euler, Lagrange, and Poisson. The English reader may find the varieties of the elastic curve discussed in the appendix to Whewell's 'Mechanics.'

The elastic force of a twisted string follows a law precisely similar to that of one which is only stretched: the latter is proportional to the extension, the former to the torsion. Thus, if a

cylindrical elastic thread, fixed at one extremity, be twisted by a force applied perpendicularly to its length, any straight line taken along the surface of the cylinder will be converted into a helix; and with a double torsion the circular arc through which each point has been removed from its original place is doubled. And since the circular arc may be subdivided into any number of equal arcs, the successive resistances of the elasticity to the additional torsions are equal, supposing each preceding resistance to be sustained. Therefore the accumulated force of torsion is proportional to the angle through which an index would move if fixed at any point perpendicularly to the length of the cylinder, or in the prolongation of its radius: but this law has limits as well as that for the elasticity of extension; for the torsion may be continued until a strain is produced, when there will of course be an accompanying diminution of elastic force. [TORSION.]

The range of the elastic force of fluids, in consequence of their great resistance to compression, is extremely limited, and therefore few ordinary phenomena of nature are dependent on this cause. The great pressure at considerable depths in the ocean must produce a corresponding increase of density in the lower strata, if it is not in a great measure compensated by the increase of temperature.

There exists one simple and uniform law for the elastic forces of dry air and all the gases. From the experiments of Boyle, Mariotte, and Dalton, it is established, that the elasticity, which is proportional to the pressure, is inversely as the volume, and therefore directly as the density, when the temperature is constant.

But an increase of temperature produces an increase of the elastic force of gases: or, which is the same, under a given pressure it expands the gas into a greater volume. Between the temperature of melting ice and boiling water this increase of volume is proportional sensibly to the additional temperature, measured by a mercurial thermometer, as was well established by the experiments of Gay-Lussac; but by the more recent experiments of MM. Dulong and Petit, it appears that at much higher temperatures the degrees of the mercurial and gas thermometers no longer correspond; for the expansions of the mercury might be expected to become irregular when it tends to gasify, and therefore to have greater expansions for each degree of heat than in its liquid state. ('Annales de Chimie et de Physique.')

When a space is saturated with aqueous vapour or steam, the elasticity remains the same when the volume is diminished, the only effect of compression being to convert the surplus portion into water. The contrary holds generally in gases, since their elasticity is inversely as their volume; but it is probable that with very high pressures, such as that employed by Mr. Faraday to liquefy carbonic acid gas, there exists a limit for each, beyond which it is impossible to render them more elastic by compression.

Moreover, the ratio of the elastic force of dry gas at the temperature of boiling water to that at the freezing point is by no means the same as in aqueous vapours; but at very high temperatures it seems probable that similar ratios would approximate.

The elastic force of steam is found to increase nearly in a geometrical progression when the temperature is increased in an arithmetical progression; from which property steam has now become a great mechanical agent.

When vapours are mixed with each other at the same temperature and in the same space, the elastic force of the compound is the sum of the separate elasticities, provided this sum is not sufficiently great to render any of the vapours liquid, and provided these vapours have no chemical affinity.

[MATERIALS, STRENGTH OF; IMPACT.]

ELATEA. [PHOCIS.]

ELATE'RIDÆ, a family of Coleopterous insects belonging to the section *Sternoxi* (Latreille), and, according to Linnæus, constituting the genus *Elater*.

The insects of this family are of a lengthened form: the head is, in nearly all cases, deeply inserted into the thorax: the thorax is usually of the same width as the elytra, or nearly so, longer than broad, and the posterior angles are acute, and most frequently produced into a pointed spine-like process: the elytra are long and narrow, cover the abdomen, and their external margins are often nearly parallel. The antennæ are of moderate length, either filiform, serrated, or pectinated, and when the insect is at rest they are deposited in two grooves on the under side of the thorax; at least such is the case in very many of the species. The legs are short and rather slender, and the femora and tibiæ are generally compressed.

These beetles are found upon flowers and upon the leaves of trees and plants; some species however are most frequently met with upon the ground.

When upon any elevated situation, if approached, they apply the legs and antennæ close to the body, and allow themselves to fall to the ground; if they fall upon their back they regain their natural position by a leap, which is always accompanied by a snapping noise similar to that which may be made by the finger-nails. When about to leap, they bend the thorax backwards, so that the body is arched, or rather forms an angle, the insect then resting upon the apex of the abdomen and the fore part of the thorax. The leap appears to be effected by the sudden relaxation of the muscular effort which kept the thorax bent backwards, there being a peculiarity in its structure which causes it to spring forwards.

Even in a dried specimen, upon attempting to bend the thorax back, we found considerable resistance; but when allowed, it suddenly assumed its natural position, which is a slight inclination forwards.

There is a strong spine, it must be observed, on the under part of the thorax, at its base, which, when the thorax is in its usual position, is deposited in a groove; and it is said that the leap is performed principally by means of this spine, which is at the time forcibly pressed against the margin of the hollow 'into which it sinks suddenly, as if by a spring.' From this opinion we

are inclined to differ; for upon removing the spine we found not the slightest alteration in that natural spring in the thorax which we before mentioned.

The larvæ of the *Elateridæ* of which the Wire-Worm is one, feed most commonly upon vegetable substances: rotten wood affords food to many; others live in the ground, and feed upon the roots of plants: one of them (the larva of *Elater striatus* of Fabricius) is said to attack the roots of wheat, and when in great numbers to do much injury.

These larvæ are long, rather slender, generally cylindrical, and covered with a tough skin: the head and terminal joint of the body are of a corneous texture; the latter is very variable in form, and is often depressed and produced into two bluntly-pointed processes: the former is furnished with the usual parts, such as jaws or mandibles, maxillæ, palpi, labrum, labium, and antennæ. The three segments which constitute the thorax are each furnished with a short pair of legs.

Latreille divides the *Elateridæ* (*Elater*, Linn.) into the following genera:—*Galba, Eucnemis, Adelocera, Lissomus, Chelonarium, Throscus, Cerophytum, Cryptostoma, Nematodes, Hemirhipus, Stenicera, Elater proper, Campylus*, and *Phyllocerus*. Many of the foreign species are luminous, as the *Elater noctilucus* of South America and the West Indies, which is called the *Fire-Fly*, and with about twenty other species is included in Illiger's genus *Pyrophorus*. (Cuvier, *Règne Animal*, vol. iv. p. 49 et seq.)

ELATERIN, a vegetable principle extracted from the wild cucumber (*Momordica elaterium*). Elaterin has a bitter and somewhat styptic taste. It is insoluble in water, and in dilute acid and alkaline solutions. It is soluble in 5 parts of cold alcohol and 2 parts of boiling alcohol, and also in æther and fixed oils. It melts at a few degrees above 212°, and at a higher temperature it is volatilized in very acrid white vapours. Elaterin acts strongly as an emetic or purgative, in doses of 1-12th or 1-10th of a grain. It has not been analyzed.

ELATINA'CEÆ, a natural order of plants belonging to Lindley's Calycose group of polypetalous Exogens. The species are found in marshy places and under water in all parts of the globe. *Merimæa* is a South American genus, of which but one species, the *M. arenarioides*, a native of Brazil, has been described. *Bergia* includes four species; one is a native of Egypt, one of Java, one of the East Indies, and one of the Cape of Good Hope. *Elatine* has five species. *E. Hydropiper*, Water-Pepper, grows under water, and is very common in ground subject to inundations throughout France. It is a very rare plant in Great Britain, and has been found only in Wales and Ireland. *E. hexandra* is a minute plant forming small matted tufts under water, and is common in France but rare in Great Britain.

ELBA, the *Ilva* of the Romans, is a small island in the Mediterranean, divided from Tuscany by the channel of Piombino, which is about 5 miles wide at the narrowest part. The shape of Elba is very irregular. Its greatest length is about 18 miles, its greatest breadth is about 10 miles. The area is about 154 square miles. The island is mountainous. The highest summit, Monte della Capanna, in its west part, is 3600 feet above the sea. The vine, the olive, the mulberry, and other fruit trees flourish; wheat, maize, vegetables, and water melons, are grown. Wine, both white and red, is made. Horned cattle and horses are scarce; sheep, goats, pigs, and asses are numerous. Fish is plentiful, and the tunny fishery yields a considerable profit. Salt is made at various places along the coast. Elba has rich iron mines, which were worked in the time of the Romans. Owing to the scarcity of fuel the ore is taken to the mainland to be smelted. The other mineral products are loadstone, alum, vitriol, and marble. The population of Elba is about 13,500, of which Porto Ferrajo, the capital and residence of the governor, has about 3000. From Porto Ferrajo a good road, 5 miles in length, made by Napoleon, leads to Porto Longone, a small fortress and harbour on the east coast. Of the other villages the most important is Rio in the north-east part of the island and near the famous iron mines. Napoleon Bonaparte resided in Porto Ferrajo after his first abdication, from May, 1814, to the 26th of February, 1815, when he sailed for Cannes. Since that time Elba has been annexed to the grand duchy of Tuscany. (Neigebaur, *Gemälde Italiens;* Pini, *Osservazione sulle Miniere di Ferro dell' Isola dell' Elba.*)

ELBE, one of the largest rivers in Europe, rises in 50° 46′ N. lat., and 15° 35′ E long., on the western side of the Schneekoppe, one of the highest of the Riesengebirge mountains in the north of Bohemia, and runs in a general southern course as far as Pardubitz, in the circle of Chrudim, where, increased by the Chrudimka, it takes a westerly direction to the town of Kölin. In this part of its course it is joined by the Dobrowa. From Kölin the Elbe runs N.W. past Podiebrad; below this town it again pursues a course due west past Brandeis (above which it receives the Iser and Elbe-Kostoletz) to Melnik, where it is increased by the Moldau, and from which place it has an unobstructed navigation to its mouth. From Melnik it has a tortuous course generally towards N.W. to about 14° E. long., and is joined by the Eger a few miles above the town of Leitmeritz. From this place it flows northwards to Aussig, takes a winding north-easterly course past Tetschen, where it receives the Pulznitz, bends gradually north-westwards, quits Bohemia near Hernkretschen, by the wild narrow pass between the Erz and the Lausitz mountains, and enters the kingdom of Saxony. At this point the Elbe is 335 feet in width. It thence takes a north-westerly course past Schandau, Pirna, Dresden, and Meissen, and enters Prussian Saxony about seven miles above Mühlberg. From Mühlberg its course is north-westerly past Torgau to Wittenberg, above which it receives the Schwarze Elster; here it takes a westerly direction, leaves for a while Prussia, traverses the Duchy of Anhalt, during its passage through which it receives the Saale and Mulde, and re-entering Prussia above Aacken, flows on to Magdeburg, whence it runs N. by E., receiving the

Ohre on its left bank, and continues in the same direction until it reaches the point below Sandow, where it is joined by the Havel. Here it again has a north-westerly direction, crosses Brandenburg, which it separates for a few miles from Hanover: thence it separates Hanover from Mecklenburg until it enters the north-eastern districts of Hanover. After traversing them as far as Boitzenburg, it divides the Hanoverian dominions from the duchies of Lauenberg and Holstein and the Hamburg territory, until it discharges itself into the North Sea. From Hamburg and Altona downwards to Glückstadt in Holstein, and thence to the North Sea, it becomes navigable for large ships. Its mouth lies north of Cuxhaven, about 85 miles below Hamburg.

The whole length of the Elbe is about 710 miles, and it is navigable for about 470 miles. Its mean depth is 10 feet, and its average breadth 900 feet, but it widens at some points to 1000 feet and more, and near its mouth to several miles. The navigation of the river below Hamburg is difficult, on account of the number of islands and sandbanks that occur in this part of its course. By the Moldau, which is navigable as far as Budweis, and the railroad from this town to Linz in Upper Austria, the Elbe is connected with the Danube; it has communication also with the Oder by the Havel and the connecting canals. The benefits derivable from the navigation of this river were formerly very much curtailed, and are still considerably, by the number of duties levied by the several states through which it flows.

This river is well stocked with fish, particularly salmon, eels, and sturgeons.

ELBERFELD, a large manufacturing town in the Düsseldorf government of the Prussian Rhein-Provinz, stands in 51° 16′ N. lat., 7° 8 E. long., 17 miles by railway E. from Düsseldorf, and has 35,000 inhabitants. It is a long straggling town running along both sides of the Wupper, which here flows through a narrow valley. Some parts are well built and paved, but most of the town is composed of irregular, narrow, and dirty streets. Here and there are seen spacious houses fronted with cut stone and in the best architectural styles. The river is a most disgusting object, being the receptacle of all the sewers and offscourings of the numerous dyeing establishments of the town. The waters of the Wupper however are said to possess most valuable bleaching properties, and to this circumstance Elberfeld is indebted for its origin and prosperity. The town is the seat of an extensive cotton and silk manufacture, but is more important still for its dyeing, printing, and bleaching establishments. The cotton printers and silk-dyers consume a large quantity of piece-goods that are woven by hand in the surrounding districts; their patterns, which are very superior, are designed on the premises of the large printers, who keep French artists at high salaries in their employ. Merinos and fancy woollen goods are also manufactured here. The town has 69 dyeing establishments, 10 bleaching grounds, 6 cotton-spinning factories, 1 large woollen mill, with machine makers, and colour works; it has also block-pattern cutting, printing, engraving and lithographic printing, establishments. Tapes and ribands are an important article of manufacture, with which this town and Barmen (which touches Elberfeld on the north extremity) supply all Germany. The colour called Turkey red is produced in Elberfeld more cheaply and of better hue than in any other place in Europe. Of the public buildings the Roman Catholic church, which is in the Byzantine style, and the Guild-hall, in the great room of which is a beautiful frieze, painted by the artists of the Düsseldorf school of painting, are the most remarkable. The town has a gymnasium, a museum, several banks, 2 orphan asylums, 3 hospitals, and a great number of educational establishments. Among these last is one for young manufacturers and the managers of factories, in which the mechanical processes in the construction of the jacquard-loom cards, and the calculations accompanying them in weaving, are taught, as well as pattern-drawing. This establishment, one of great efficiency and importance, is supported by the town, which also maintains its own poor by means of a rate. (Banfield's *Manufactures of the Rhine*; Murray's *Hand-book for North Germany*.)

ELBEUF, a large manufacturing town in the department of Seine-Inférieure in France, stands in a beautiful valley on the left bank of the Seine, at a distance of 78 miles N.W. from Paris, and 13 S.S.W. from Rouen. The population in 1841 amounted to 14,646, exclusive of about 10,000 workpeople, who remain in the town only on the days they are employed at the factories, their fixed residence being in the villages of the neighbouring communes. The town is in general ill built, ill laid out, and badly paved; but within the last 20 years many improvements have been made. A great number of large factories and handsome edifices have been erected, the quays extended, the old streets widened, and a spacious *champ de foire*, or market-place, with side avenues planted with chestnut trees, has been constructed. The streets are lighted with gas, and the town is well supplied with water from 8 Artesian wells, one of which feeds 6 public fountains. The most remarkable public buildings in Elbeuf are the churches of St.-Etienne and St.-Jean-Baptiste, the interiors of which are richly decorated and lighted through fine painted windows.

Elbeuf has a tribunal and chamber of commerce and a *conseil des prud'hommes*, or council of experienced men, for the settlement of questions between manufacturers and their workmen [PRUD'HOMMES, CONSEIL DES]. The factories of the town and neighbourhood, which exceed 200 in number, and are mostly worked by steam power, produce a great quantity of woollen cloths; the descriptions are various, and include double-milled and waterproof cloths, zephyrs, and fancy cloths of all colours. From 60,000 to 70,000 pieces of 60 yards each, at from 10 to 20 francs a yard, are produced annually. The cloth is purchased of the manufacturers by large commission houses, of which there are about 70 in the town, and by them it is sent to various parts of France. This town is also celebrated for the manufacture of billiard-table cloth and flannel. It contains several dye-houses, fulling-mills, and large wool-stores,

besides establishments for washing wool, which lie along the Seine and the Puchot, a small winding stream that traverses the town. Elbeuf has regular communication with Rouen by steamboats, and with Paris by the Paris and Rouen railroad, from the Tourville station on which it is 4¼ miles distant.

(*Dictionnaire de la France;* Macgregor's *Commercial Statistics.*)

ELBING. [DANZIG.]

ELBURZ, or ELBROOZ. [CAUCASUS.]

ELCHE, the *Illici* of the Romans, a flourishing town in the province of Valencia, in Spain, is situated in 38° 15′ N. lat., 45 W. long., about 14 miles S.W. from Alicante. The population is about 25,000. The town is divided by a ravine, over which is a handsome bridge, and the houses, which are of Moorish form, red-coloured, with flat roofs, and few windows, rise one above another. The best church is that of Santa Maria, which is well built, and has a fine portico. The Alcazar, or Moorish castle, has been converted into a prison. The town is surrounded on all sides and to a considerable distance with date-palm-trees, some of which are of great age. The dates are sent to Alicante for exportation. The appearance of the town and neighbourhood is peculiarly oriental.

ELDER. [SAMBUCUS.]

ELDON, JOHN SCOTT, EARL OF, was the son of William Scott, of Newcastle-upon-Tyne, who followed the business of what is called a coal-fitter, in which he acquired considerable wealth. John was the eighth child by a second marriage. The eldest son was William, born in 1745, who became Lord Stowell. [STOWELL, LORD.] John was born June 4, 1751, and after proceeding through the royal grammar school of his native town, he was sent to Oxford (whither his eldest brother William had preceded him), in May 1766.

On July 11, 1767, he was elected to a fellowship in his college, having then just completed his sixteenth year; he took his bachelor's degree Feb. 20, 1770; gained, in 1771, the chancellor's prize of 20*l.* for an English prose essay on 'The Advantages and Disadvantages of Foreign Travel;' but forfeited his fellowship by running off, on Nov. 18, 1772, with Miss Elizabeth Surtees, daughter of Aubone Surtees, Esq., banker, of Newcastle, whom he married at Blackshiels in Scotland, the next day. The lady's father was very angry, and it was some time before he was reconciled; but at last he agreed to give his daughter a portion of 1000*l.*, Mr. Scott making over to his son an equal sum. John Scott had at first some thoughts of taking orders, but at length determined in favour of the law. He was entered a student of the Middle Temple in January, 1773; and he took his degree of master of arts on February 13 in the same year.

During the years 1774 and 1775 he held the office of a tutor of University College, and read law lectures as deputy for Sir R. Chambers, the Vinerian Professor; but when called to the bar on Feb. 9, 1776, he settled in London and joined the Northern Circuit. His progress at the bar was slow, but at length an election case (that of Clitheroe, in 1780) established his reputation, and his practice from this time increased rapidly. In June 1783, he was one of several junior counsel who were called within the bar, and made a bencher of his Inn of Court. About the same time he was returned to parliament for the borough of Weobly. He and Erskine, on opposite sides, made their maiden speeches in the same debate, that on November 20, on a motion connected with the famous India bill, which eventually upset Fox's government. The coalition ministry was turned out on December 18, and on March 24, 1784, the king prorogued, and the next day dissolved, parliament, after the opposition to Pitt and the new government had been gradually brought down, in the course of a long series of divisions, to a majority of one. Mr. Scott was again returned for Weobly; and in the new parliament he took a prominent part in most of the legal questions that came before the House.

In March, 1787, Mr. Scott was appointed chancellor of the bishopric and county palatine of Durham, and in June, 1788, the office of solicitor-general was conferred on him. At the same time he was also knighted. He held the office of solicitor-general till February, 1793, when he was made attorney-general on the promotion of Sir Alexander Macdonald to the place of Chief Baron of the Exchequer.

The period of Sir John Scott's tenure of the office of attorney-general extends to the year 1799. It is memorable for the state trials connected with the political excitement produced in this country by the breaking out of the French Revolution. Muir, Palmer, Skirving, Margarot, and Gerald, had all been convicted of sedition in Scotland, and sentenced to fourteen years' transportation, when in October, 1794, Hardy, Horne Tooke, Thelwall, Holcroft, and their associates, were indicted for high treason at the Old Bailey. Only Hardy, Tooke, and Thelwall were tried; all three were acquitted, and the prosecutions against the other prisoners were dropped.

In July, 1799, on the death of Sir James Eyre, Chief Justice of the Common Pleas, Sir John Scott claimed and obtained that office, agreeing at the same time to go into the House of Lords. Lord Eldon established a high character as a common law judge, and was also much attached to his office; to the end of his life he used to express the strong regret with which he had left the Court of Common Pleas.

On Lord Loughborough's resignation of the Great Seal in April 1801, about a month after Mr. Pitt had been succeeded as prime minister by Mr. Addington, Lord Eldon became Lord Chancellor, April 14. He continued to hold this office till Feb. 7, 1806, when, on the accession of the Whig ministry of Mr. Fox and Lord Grenville, he was succeeded by Lord Erskine; he resumed it on April 1, 1807, on the return of his party to power; and he finally resigned it on April 30, 1827, when Mr. Canning became prime minister, and the Great Seal was given to Lord Lyndhurst. He was raised to the dignities of Viscount Encombe and Earl of Eldon in 1821.

During nearly all the time that Lord Eldon sat

on the woolsack he took a leading part in the general debates of the House of Lords; he was also understood to be one of the most influential members of the cabinet. The two great measures of Parliamentary Reform and Roman Catholic Emancipation in particular were steadily opposed by him on all occasions, and to the last.

Lord Eldon survived in retirement till Jan. 13, 1838, and was succeeded in his peerage by his grandson, the present earl.

(*The Public and Private Life of Lord Chancellor Eldon, with Selections from his Correspondence*, by Horace Twiss, Esq., one of her Majesty's Counsel, 3 vols. 8vo., Lond., 1844.)

EL DORA'DO, literally 'the golden country,' was the name given by the Spaniards in the 16th century to an imaginary region somewhere in the interior of South America, between the Orinoco and the Amazon, where gold and precious stones were supposed to be in such abundance as to be had for merely picking them up. This story was communicated by an Indian Cacique to Gonzalo Pizarro, brother of the conqueror, who sent Francisco Orellana down the Amazon river to discover this wonderful land. Orellana followed the course of the Amazon down to the sea, but he did not find El Dorado. The story however continued to be credited for many years afterwards, and Raleigh was so persuaded, or pretended to be persuaded, of the existence of this wonderful country, that he fitted out more than one expedition for the purpose of discovering and conquering it for England. [RALEIGH.]

ELEATIC PHILOSOPHY has its name from Elea (called by the Romans, Velia), a Grecian colony on the western coast of Lower Italy, where Xenophanes of Colophon settled in his old age (about 530 B.C.) and founded a school distinguished by its bold attempt to construct a system of the universe upon metaphysical principles. The theory was brought to perfection by Parmenides, but the school also reckons among its members Zeno, Melissus, and Empedocles, who however only gave a further development to particular principles; the labour of Melissus being mainly confined to the defence of those positions which were opposed to the Ionian physics, while Zeno and Empedocles exhibit the opposite aspects of the theory, the former confining himself to its doctrine of the supra-sensible, the latter to a detailed application of its physiological views. [XENOPHANES; PARMENIDES.]

ELECAMPANE, the herbalist's name of the plant called *Inula Helenium*. It is esteemed as a grateful stomachic. Its leaves are aromatic and bitter, but its root much more so. The root is used in Europe to flavour certain sorts of confectionary which bear its name; and it enters into the composition of several continental carminatives. [INULA.]

ELECTION (Lat. *electio*), in divinity, is a doctrine which, on the authority of Scripture, and as a consequence of the omniscient and prescient attributes of God, teaches that from all eternity the destiny of every individual of mankind was determined by an immutable decree, some (the elect) being ordained to eternal salvation, while others (the reprobate) are left to inevitable and eternal damnation. The term election is often considered as but another name for the doctrine of predestination, both implying that man is subject to a certain predetermined fate. This doctrine in modern times is associated constantly with the name of Calvin, though similar notions were maintained or opposed among the philosophical and religious sects of the ancient Gentiles, Jews, and Christians. The system of Calvin is set forth in his great work entitled 'Institutes of the Christian Religion' (Institutiones, &c.).

ELECTION is when a man is left to his own free will to take or do one thing or another which he pleases ('Termes de la Ley'); and he who is to do the first act shall have the election. If A covenants to pay B a pound of pepper or saffron before Whitsuntide, it is at the election of A at all times before Whitsuntide which of them he will pay; but if he does not pay either before the time fixed, then it is at the election of B to sue for which he pleases. If a man give to another one of his horses, the donee may take which he chooses; but if the donation be that he will give one of his horses (in the future tense), then the election is in the donor.

Courts of equity frequently apply the principle of election in cases where a party has inconsistent rights, and compel him to elect which he will enforce: as if A by his will assumes to give an estate belonging to B to C, and gives other benefits to B, B cannot obtain the benefits given to him by the will unless he gives effect to the testator's disposition to C. It does not appear to be quite settled whether the party who elects to retain his own property in opposition to the instrument is bound to relinquish only so much of the property given to him as will be sufficient to compensate the disappointed parties, or whether his election will be followed by absolute forfeiture of the whole. The arguments on both sides are stated 1 Roper, Husband and Wife, 566 n.; 1 Swanst. Reports, 441; 2 Coke's Repts., 35 b., Thomas's note. The principle of election is of universal application, and prevails in the law of all countries; it is applicable to all interests, whether of married women or of infants; to interests immediate, remote, or contingent; to copyhold as well as to freehold estates; to personalty as well as to realty; to deeds as well as to wills.

On election under a will in the Roman Law see 'Dig.' xxxiii. tit. 5, 'De Optione vel Electione Legata:' and as to the French law, see the 'Code Civil,' art. 1189, &c., 'Des Obligations Alternatives.'

The term Election is borrowed from the Roman Law. The word *optio* often occurs in the Roman writers to express that a man may choose of two or more things or conditions, which he will take. The instances of election and option given in the title of the 'Digest,' above referred to, are limited to options given by way of legacy, which is the subject treated of in that part of the 'Digest.' Probably the legal meaning of election and option was limited to election under a testament.

ELECTION-COMMITTEES. Till 1770,

when the act well known as the Grenville Act was passed, questions of controverted elections were decided by the whole House of Commons: and every such question was made a party contest. The Grenville Act introduced a plan, which with several modifications continued till 1839, of appointing committees by lot for the trial of election petitions. Since 1839 a different system has been in operation, under which the choice of members of election-committees has not been left to chance, and their individual responsibility has been increased by diminishing the number of members. By the 7 & 8 Vict. c. 103 (passed in 1844), the number of members of an election-committee was reduced from seven to five, including the chairman.

The 7 & 8 Vict. c. 103, now regulates the constitution and the proceedings of committees on controverted elections. On this subject May's 'Treatise on the Law, Privileges, and Proceedings and Usages of Parliament,' pp. 341–373, may be consulted.

The second section of the act defines election-petitions, and specifies by whom they must be signed. Election-petitions are petitions complaining, 1, of an undue election; or 2, that no return has been made to a writ on or before the day on which the writ was returnable; or, 3, if the writ be issued during any session or prorogation of Parliament, that no return has been made within fifty-two days after the date of the writ; or, 4, that a return is not according to the requisition of the writ; or, 5, of special matters contained in the writ: and they must be signed by some person claiming therein to have had a right to vote at the election, or to have had a right to be returned, or alleging himself to have been a candidate at the election.

All election-committees are empowered to send for persons, papers, and records, and to examine any one who may have signed the petition, unless it shall appear that he is an interested witness, and to examine all witnesses upon oath, which is to be administered by the clerk attending the committee. Election-committees are the only committees of the House of Commons in which evidence is taken upon oath. Any one giving false evidence is made liable to the penalties of wilful and corrupt perjury.

Parties complaining of or defending a return are required to deliver in to the clerk of the General Committee of Elections lists of the voters intended to be objected to, with the several heads of objections, not later than six in the afternoon of the sixth day next before the day appointed for choosing the committee to try the petition; and the election-committee cannot enter into evidence against any vote, or upon any head of objection, not included in the lists.

The committee must decide 'whether the petitioners or the sitting members, or either of them, be duly returned or elected, or whether the election be void, or whether a new writ ought to issue.' Their decision on these points is final between the parties: and the House carries it into execution.

ELECTOR. [Municipal Corporations; Parliament.]

ELECTRIC TELEGRAPH. [Telegraph, Electric.]

ELECTRICAL ATTRACTION. [Attraction, Electrical.]

ELECTRICITY (ἤλεκτρον, amber). The electric phenomena, connected as they are now known to be by certain well-ascertained laws, form together the most complete and important addition to the physical sciences which has been made since the time of Newton.

The simplest and most usual mode of producing electricity is by friction. When any two substances are rubbed against each other briskly it is always produced; but it is only a particular description of bodies called non-conductors that retain it after it is thus produced so as to exhibit its primary effects.

The production of electricity may be observed in a very familiar manner thus:—Tear a piece of paper into small fragments, and place them on a table, then take a stick of sealing-wax, and having rubbed it briskly with a piece of flannel, or woollen cloth, hold it near the fragments of paper; these small pieces will be soon observed to fly with considerable velocity to the wax, to which having adhered for some time, some will suddenly jump off, and others will fall away by their own gravitation. It was by observing amber produce similar effects after friction to those we have described that electricity obtained its name.

Glass is now more commonly employed to produce electricity than any wax or gum; and there is a striking difference in the kind of electricity then generated, which we shall afterwards notice. These bodies are non-conductors, as they manifestly retain their electricity beyond the moment of its production.

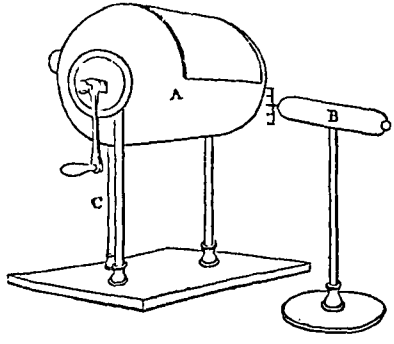
Water is a conductor of electricity; for on immersing a conducting isolated and electrised substance in water, it will completely lose its electrical properties. Perfectly dry airs or gases, on the other hand, are non-conductors; but we are not aware that it has yet been established whether the vapours of all substances are conductors (or all the gases non-conductors). Aqueous vapour certainly is a conductor; and therefore when the air is impregnated with moisture it is difficult to perform any electrical experiments which require duration.

Hence a conductor constitutes a channel by which the electricity produced on a non-conductor will gradually escape, and a non-conductor constitutes an isolator by which the electricity communicated to a conductor may be retained.

Previous to our study of the properties of electricity, on which the construction of the best machines for procuring it in large quantities depends, it will be useful to describe a simple apparatus, and one easily constructed or procured, by which we may learn the first laws of electrical action.

A represents a glass cylinder the axis of which is supported on a frame, and which is pressed against by a cushion stuffed with horse-hair, and covered by an amalgam of zinc and mercury spread over its surface; this cushion is attached to a conducting bar C, such as a lamina of iron connected

with the frame, and with it communicating with a table or the ground.



At one extremity of the axis of the cylinder is attached a handle by which it may be rapidly turned round, and the friction which is generated against the cushion will produce electricity on the surface of the glass, to guard which against the action of the moisture of the air, the upper side of the cylinder may be lapped over by a piece of glazed taffeta in the direction of the rotatory motion of the cylinder.

B is a long narrow and hollow metallic cylinder standing on a glass support, and having at the extremity near A a small cross bar garnished with points or teeth presented towards the cylinder. B is called the conductor in this apparatus.

When the cylinder A is turned briskly round, the motion will be accompanied by a crackling noise, and if in the dark, streams of light of a blueish hue will be perceived directed to the several points on the projecting bar of the conductor.

B may be thus charged with electricity, and when removed from the presence of the cylinder (taking it away by its isolating support), it will retain its electrical properties (the longer as the air is more free from moisture), and will by simple contact communicate a portion of its electricity to another isolated conducting substance, or be discharged by touching one not isolated: if, with a feeble charge, it is touched by a finger, a sensation like the pricking of a needle is felt, accompanied by a faint spark apparently penetrating the fingers.

Glass plates are now in more general use than cylinders for the production of electricity by friction.

We shall now observe, as our first phenomenon, that neither the cylinder which has generated and given out electricity, nor the conductor which has acquired it, exhibits the least alteration of weight, nor will the greatest possible accumulation of electricity produce the least perceptible alteration in this way. Those who suppose that electricity is a distinct species of matter, have therefore denominated it an *imponderable fluid*.

The next phenomenon to notice is the limit to the quantity of electricity we can communicate to a perfect conductor. If from different sources of electricity we charge a metallic ball, and so continue to charge, we shall find that there is a limit beyond which we cannot communicate more; for on attempting so to do, the ball will discharge itself through the air into the nearest conducting body, when a spark, describing apparently a zigzag course, will be observed, the colour of the light being dependent on the medium it traverses. This spark travels with immense velocity, and is accompanied by a very audible sound; and if received by the body of a man or animal, it produces through a part or the whole of the system an instantaneous muscular contraction, which may be sufficiently strong to cause death.

Two points determine this limit, or fix the charge of which a perfect conductor is susceptible. The first is the extent of its surface, and the second is the pressure of the non-conducting medium by which they are encompassed.

That the quantities of electricity should follow the law of proportionality to the surfaces, and not to the content or weight of the body, will not excite surprise when we state that no developed electricity exists within a body, at least to any appreciable depth below its surface. This fact has been repeatedly confirmed experimentally; and in consequence of this law we see the advantage of using a long cylindrical form for a conductor, and perceive the proportions in which the partition of electricity takes place when several similar conductors communicate.

The third phenomenon is the mutual repulsion of the different parts of developed electricity: these parts repel each other with forces which vary inversely as the square of the distance. We may easily witness this repulsion in the following familiar manner. Take a small well-dried ball of elder-pith, and suspend it from the hand by a fine silk thread, which is a good non-conductor; then bring it near the conductor of an electrical machine, or to a body to which this conductor has communicated electricity. The ball will at first be attracted to this body; but when it has touched it and shared a small portion of its electricity, it will be repelled from it and will stretch the string by which it is suspended in a slant direction, until the obliquity is sufficiently great for its own gravity and the tension of the string to counterpoise the repulsion of the electricity on the conductor.

That the law of force in this case is, as in gravitation, expressed by the inverse square of the distance, was satisfactorily demonstrated by Coulomb by means of his torsion balance. [Torsion.] A remarkable fact arises from it, namely, if an electrised pith-ball be placed anywhere within the concavity of a spherical shell, it will not be moved in any direction by the repulsion of the electricity on the surface of the shell. This law was first demonstrated by Newton, and it was afterwards shown by other analysts, that for no other law of force but that stated could the same mutual destruction of forces occur.

We have supposed the cushion by which the

cylinder is rubbed to be in communication with the ground by a conductor; but if two substances both isolated be electrised by friction, and if, when separated, the electricities belonging to each surface be examined, we find the following results :—

Let two isolated pith-balls A and B, be electrised by communication with one of the surfaces, and two other balls *a*, *b*, in like manner electrised by the other surface.

Then when A is presented to B, or *a* to *b*, repulsion takes place as before described; but when A is presented to *a*, or B to *b*, they will attract each other; and if A *a* have equal charges from the different surfaces which have been rubbed against each other, when contact takes place between A and *a*, all signs of developed electricity will depart from each, and the bodies will take their natural positions, neither attracting nor repelling each other; but if A has a greater electrical charge than *a*, a surplus of the electricity of A will remain, and will be partially communicated to *a* when a consequent repulsion arises.

The same results would occur if two machines were used, in one of which the cylinder is glass, and in the other resin or a gummed substance: the pith-ball which receives its electricity from the glass cylinder will attract that which has been in communication with the other machine.

Hence arise the terms *vitreous* electricity and *resinous* electricity, or, as they are now more usually and properly called, positive electricity and negative; for whatever two substances they may be which are rubbed together when electricity is produced, it will be found positive on one substance, and negative on the other, even if the substances are of the same nature; for instance, both glass.

Dr. Franklin assumed that there is but one electric fluid, which he conceived to be in excess, or above its natural state, in bodies positively electrised, and in defect in those said to be negatively electrised. But M. Epinus, and most of the continental philosophers after him, suppose two distinct electrical fluids, the particles of each of which repel those of the same kind, but attract those of the contrary, and therefore the opposite electricities always seek combination or neutralization, so that in natural bodies the two fluids exist in equal quantity, by which the presence of neither is indicated.

The hypothesis of two fluids is now generally adopted, but all the phenomena may be readily explained on Franklin's theory.

The pressure of the electricity on the surrounding medium, when the body is perfectly conducting, determines the direction of the motion under the influence of foreign electrised or non-electrised substances, which, by rendering this pressure unequal on the different parts of the surface, produce motion by the unequal reaction of the medium. But imperfectly conducting bodies have in themselves a certain retentive or coercive force, and the electrical particles, instead of then freely obeying the external impressed force by a corresponding law of arrangement or accumulation amongst themselves, communicate the forces impressed to the particles of matter by which they are restrained. In imperfect conductors the force is partially exercised in each of these ways. The circumstances of the motions of electrised substances therefore vary with their conducting faculty.

If a sphere have uniformly diffused over its surface a charge of either kind of electricity, and there he placed in contact with it a sphere of equal magnitude in which the electric fluids are in equilibrio, a mutual action between the spheres will take place; the effect of which will be that the fluid particles of opposite kinds in both spheres will have their equilibrium disturbed, and equal quantities of both kinds will flow to the surface of each: the density of the fluid or the thickness of the stratum at either surface being different in the circumferences of circles at different distances from the point of contract.

When a sphere, charged as above supposed, is placed in contact with another in which the fluids are in equilibrio, whatever be the ratio between the diameters of the spheres, the density or the thickness of the stratum of fluid on each is, at the point of contact, equal to zero; and at the opposite extremity of the diameter passing through that point, the density is the greatest. Representing the density opposite to the point of contact by unity, the results of Coulomb's experiments with two equal spheres show that, in an indefinitely narrow zone, at thirty degrees from the point of contact on each, the density may be represented by 0·2; at sixty degrees from that point, by 0·76; and at ninety degrees, by 0·95: it is found also that the mean density on each sphere is represented by 0·79.

When a body is of an irregular figure, and is electrised, the electricity of its surface will be differently accumulated at the different parts, projecting points having the most, and portions of small curvature the least, in convex surfaces; and it is a mathematical problem of considerable difficulty in some cases 'to find the law of the distribution of free electricity on the surface of a perfectly conducting body of a given form.' The datum for the solution is, that the whole action of the electric envelope on any point interior to the body is zero. We have shown that it would be so in the case of a sphere by a uniform distribution on the surface; but in other bodies this distribution cannot be uniform to produce the same effect. The next case in the order of simplicity is the spheroid, or more generally the ellipsoid, for a spheroidal shell, bounded by two similar and concentric spheroidical surfaces, and attracting by the law of the inverse square of the distance, will exercise no action on an internal point; hence the accumulation of electricity on the surface of a spheroid at any point is proportional to the normal breadth of the stratum at that point, which it may be easily proved is proportional to the perpendicular drawn from the centre on the tangent plane, or inversely as the diameter parallel to the tangent at that point.

Hence we see why the accumulation of electricity at points is so great, which are therefore part of the armature of prime conductors; for if

we conceive the axis minor of an ellipse to diminish indefinitely, while the axis major remains invariable, the breadth of the spheroid generated will be correspondingly diminished while the length remains the same, and ultimately it will approximate to the form of a needle pointed at the extremities of its axis major; the breadth of the electricity at the point is then to that at the middle of the needle as the length of the needle to its greatest breadth. Now, in consequence of the law of force being the inverse square of the distance, we find the pressure against the air is as the square of the accumulation, and consequently is very much greater at either extremity of the needle than at or towards the middle; and therefore, on being overcharged, the electrical spark is given from the extremity, when not otherwise determined by the influence of external bodies.

When electricity is generated by the friction of two substances, one acquires positive electricity, the other negative, but it is difficult to judge *à priori*, from the nature of the substances employed, the character of the electricity which each will take. The friction produced by liquids produces electricity, the electric light, when a barometer well freed from air is first filled with mercury, having been remarked from the earliest dates of the use of that instrument; and when a current of air is directed against a plate of glass, the latter will acquire positive electricity, and therefore the air negative, and the rapid agitation of a piece of silk in the air communicates to the latter positive electricity while the silk acquires negative.

The Leyden jar, which is employed to collect the electric fluid, is a glass bottle, coated within and without with tin-foil. The conductor of an electrical machine communicates with the foil on the inside by means of a metallic chain, while the outside is in communication with the ground. The opposite electricities are therefore accumulated on the internal and external sides of the glass; hence a flash and a powerful shock is produced, when the two fluids combine by touching the outside foil with one hand, while the conductor or chain communicating with the inside is touched by the other.

There seems little doubt, from the experiments of Wollaston, that much of the electricity produced by the common machine is attributable to chemical action; for the best amalgam to use with the rubber is that which oxidizes most readily, such as tin and zinc, and scarcely any quantity of electricity is produced if by the nature of the amalgam there is no sensible oxidation, or if we envelop the apparatus in a medium which will not communicate oxygen, as carbonic acid gas. As the quantity taken by the conductors is proportional, other things being equal, to their surfaces, it is usual to employ several narrow cylindrical conductors placed parallel to each other; the total surface in this case being the same as that of a single cylinder of the same length, and of which the radius would be the sum of all their radii.

(Biot's *Physique*, tome ii.; Pouillet, *Elémens de Physique;* Murphy's *Electricity;* Papers by Sir Snow Harris in the *Philosophical Transactions;* Turner's *Chemistry*, fifth ed., &c.)

Medical Application of Electricity. A supposed analogy between electricity and the nervous power has led to the employment of this agent, particularly in diseases connected with defective nervous energy, and also in cases of defective secretion, perhaps originating in a similar cause. The diseased states in which electricity has been found most useful are—in asphyxia, from any cause (except organic disease of the heart), but particularly from exposure to irrespirable gases; in certain asthmatic diseases; and dyspepsia, dependent on irregular or defective supply of nervous energy to the lungs and stomach. It is however much inferior to galvanism as a remedial agent in these diseases. In local paralytic affections, when of a chronic character, electricity, duly persevered with, has been found very useful: in a case of dysphagia, from paralysis of the œsophagus, the patient could only swallow when placed on a seat resting on nonconductors and electrified. In deafness and loss of sight, when directed by a competent judge, it has restored the functions of seeing and hearing. Lastly, in defective secretion, especially amenorrhœa, it has proved of service.

ELECTRICITY, ATMOSPHERIC. The similarity of lightning to the spark obtained by friction from an electrical apparatus was observed by the earliest experimenters in electricity; and in one of Franklin's letters, written apparently before the year 1750, the points of resemblance are distinctly stated. Franklin in America, M. de Romas in France, and Cavallo in England, each employed, for the purpose of bringing electricity from the atmosphere to the surface of the earth, a kite made of silk stretched on a frame, from the upper part of which projected a piece of pointed metal, and from which proceeded along the string a slender metallic wire: other philosophers have employed different means; and Mr. Crosse employed long wires in horizontal positions, which were insulated by being stretched between two glass pillars, each on the top of a pole planted in the ground.

The numerous experiments made by Cavallo serve to prove that the electric fluid always exists in the atmosphere, but in very different quantities at different times, and that it is more abundant in the higher regions than near the earth. The same philosopher found also that it is more intense in frosty than in warm weather, and that fogs are accompanied by a great quantity of electricity, except when they become rain; in this case, little electricity is perceptible, the rain conducting to the earth the electricity of the air above.

M. de Saussure has observed that, during summer and winter, by night as well as by day, when the atmosphere is free from clouds, the electricity of the air is positive; and Mr. Read ('Phil. Trans.,' 1794) has shown that out of 404 observations made in one year, the air was positively electrical in 241, negatively in 156, and that the electricity was insensible in 7 observations only. It was an observation of Saussure that electricity is strongest in the open air; and that it is weak in streets, in houses, and under trees. In close rooms and hospitals, the electricity of the air has

been always found to be negative; such also is the electricity of the atmosphere when it is vitiated by exhalations from lime, paint, and decaying vegetables.

All observations concur in showing diurnal variations in the intensity of atmospherical electricity, but there is some uncertainty concerning the precise times at which the intensities are the greatest and the least. M. de Saussure observed, at Geneva (1785), that, during winter, the intensity of atmospherical electricity attained its first maximum at 9 A.M.; that it diminished till 6 P.M., when it was in a minimum state; it was afterwards increased, and attained its second maximum at 8 P.M.; after which it continued to diminish till it was again a minimum at 6 on the following morning.

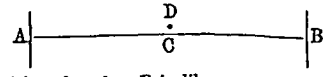
The experiments of Mr. Crosse show also that, in the ordinary state of the atmosphere, the electricity is positive, and that it increases in proportion to the elevation above the earth's surface. The same philosopher observes that it is most intense at sunrise and sunset, and weakest at noon and during the night. He finds that the approach of a thunder cloud produces a change in the electricity of the atmosphere, rendering it positive if it were before negative; and the contrary. Fogs, rain, snow, &c., also change the electricity from positive to negative, again from negative to positive, and so on; the change taking place every three or four minutes. A cold rain, in large drops, is frequently accompanied by intense electricity; and during a driving fog or rain the electricity is occasionally as strong as during a thunder-storm. Mr. Crosse finds also that the electricity of the air is very weak during the north-east winds, which in winter and spring times produce extreme cold and dryness.

The aurora borealis, and many other meteoric appearances, have been ascribed to the electricity of the atmosphere. [AURORA BOREALIS.]

ELECTRICITY, CONDENSER OF. [CONDENSER OF ELECTRICITY.]

ELECTRO-CHEMISTRY. At different periods in the history of Electricity, the terms *Electro-Chemistry*, *Galvanism*, *Galvanic Electricity*, *Voltaism*, and *Voltaic Electricity*, have been applied to that part of the science which relates to the connection between electricity and chemistry. In order to bring down the results to as late a period as convenient, this subject will be treated under VOLTAIC ELECTRICITY. The mode of developing the electro-chemical power is described under BATTERIES.

ELECTRO-DYNAMICS. In ordinary electricity, that fluid when developed takes a position of equilibrium, dependent on the conducting power of the medium on which it is disposed, on the non-conducting power of the medium by which it is enveloped, and on the law of force, whether of attraction or repulsion, between the elementary portions of electricity. The motions of electrised bodies are only results of the statical equilibrium of this fluid, and do not therefore belong to electro-dynamics. These effects are moreover of the same nature whether the source of electricity be by means of friction, or by chemical action, as in the voltaic pile, the nature of the electricities in these cases differing from each other only in the mode of their production; but when the contrary electricities are no sooner produced than recombined, again reproduced and again recombined, a new class of phenomena is produced belonging to electricity as it were in motion. Suppose, for example, that the plate A is a constant source of positive



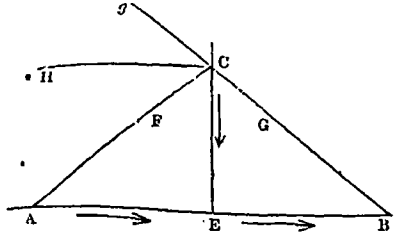
electricity, the plate B in like manner a constant source of negative electricity of equal intensity; that AC, BC are two conducting rods communicating with each; the electricities immediately combine when the conductors are made to touch at C, and for an instant the whole may be conceived to be in the neutral state, but A being the next instant replenished with positive and B with negative electricity, the same combination takes place over again, the same neutrality succeeds, and so on indefinitely. The rod ACB is in a different condition from one in its natural state, since electrical charges are continually pouring through it from A and B; and again it is in a different condition from an electrised rod, since we cannot at any moment say that it is charged positively rather than negatively. Hence we cannot infer that it should attract rather than repel an electrised ball D, and in point of fact we find that it neither will attract nor repel D. We have here a positive current of electricity issuing from A and a negative one from B, and no effect of attraction or repulsion is produced on an electrised point as in statical electricity. How then is its state recognised? First by touch; for if we touch the rod ACB, a series of shocks is felt, the interval between two succeeding ones being inappreciable; and secondly, powerful chemical decomposition may be effected. The laws of the mutual action of electrical currents constitute the science of electro-dynamics; and previous to its study it would be desirable that the reader should be acquainted with the construction and applications of the galvanic apparatus, the opposite poles of which afford the two constant sources A, B of electricity which we have supposed. These will be found under the head VOLTAIC ELECTRICITY.

To discover the laws of the mutual actions of electrical currents we must have recourse to experiment; and an apparatus fit for the purpose is described in Professor Cumming's translation of M. Dumonferrand's treatise on this subject. By this it is found that two parallel currents which are directed the same way attract each other, but when directed in opposite ways, they repel; and, when rectilineal currents form mutually an angle, if both of them approach to or both of them recede from the vertex of the angle, they attract; while, if one approaches to and the other recedes from the vertex, they repel. Thus, if two currents cross each other perpendicularly, in one of the four right angles the two currents will tend to the vertex, and in that which is opposite they will recede from it. Hence the currents taking place in two rods, one of which is fixed, and the other

capable of turning on its middle point, the attractions of the fluid in those angles should cause the latter rod to become parallel to the other: this is confirmed by experiment.

If we now consider two currents to form a very obtuse angle, one of them approaching and the other receding from the vertex, we have repulsion; let the obtuse angle be increased to 180°, and in this extreme case the two currents merge into one: hence it follows that the consecutive parts of one and the same current exercise a mutual repulsion on each other.

Let us now consider the action of an indefinite current AB, on a terminated current CE, which is directed towards E; the direction of AB being that indicated in the figure.



The portion BE of the indefinite current repels EC, in consequence of the contrary direction of the current in the latter. Let us represent this force in magnitude and direction by $Cg = CG$; also AE attracts CE; the force may be represented by CF, similarly situated with CG; but Cg, the repulsive force of BE, is drawn without the angle BEC; and CF, or the attractive force of AE, must be drawn within the angle AEC. If we now compound the forces of CF, CG, they will manifestly produce a resultant CH parallel to the indefinite current AB. Hence the terminated current will be urged by a force parallel to the other, and in a contrary direction; and by similar reasoning it is easily seen that if the direction of the current CE were contrary to that indicated by the arrow, or receded from AB, then the whole force in CE would be in the same direction as the current AB and parallel to it.

Suppose now a terminated conductor to be moveable about an axis at one of its extremities, and suppose a conductor of indefinite length to be parallel to it, the currents moving the same way in both; then the latter conductor will attract the former through a certain angle; and the forces in the obtuse angle which the conductors make with one another being now repulsive while those in the adjacent acute angle are attractive, the moveable conductor will be further turned on its axis. This action will go on constantly; and hence a continued rotation will be produced. This rotation will be in the contrary direction if we change the direction of the current in either of the conductors; or if, without changing the current, we transfer one conductor to the opposite side of the other; and if the indefinite conductor be placed so as to meet the axis of the other, there will be

no rotation. It is easy to analyse in the same manner the action of an indefinite conductor on a closed current by considering its action on each of the parts, the general effect being to bring the moveable conductor into a position of equilibrium in a plane parallel to the indefinite conductor.

Instead of a single closed circuit we may suppose any number of them connected together after an invariable manner. The action of an indefinite current will still tend to bring that system into a plane parallel to its direction. These systems have been called electro-dynamic cylinders, and also canals of currents.

For the proof that the law of force between the elements of currents is the inverse square of the distance, as in statical electricity, and for the principal theorems relating to the actions of the currents, we must refer the reader to Mr. Murphy's 'Principles of Electricity,' &c., Cambridge, 1833.

Ampère imagined an ingenious manner of calculating the actions of any plane closed conductors. Conceive one such to be divided into an infinity of small compartments by right lines parallel to the rectangular axes of co-ordinates, and the periphery of each compartment to be traversed by currents, in the same manner as the whole curvilineal side which incloses the area; then it is easily seen that all the internal sides of the compartments, being traversed by two currents in opposite directions, will have no electro-dynamical action, and therefore the sole remaining current is that which circulates in the periphery of the given figure; but by this division into compartments we can calculate the mutual actions of the two closed conductors from the very simple law which we have already given for the action of small closed conductors on each other.

In consequence of the electro-chemical causes which are so widely diffused through the globe, electrical currents are generated, which give its polarity to the magnet, and which, as is well known, are sufficient to generate continued rotations of currents.

Voltaic conductors, of which the centres of gravity are supported, undergo terrestrial action, similar to that produced by a canal of currents. We should infer, by the position which the moveable conductor takes, that the direction of terrestrial currents is nearly from east to west, having the north magnetic pole situated on their right.

ELECTRO-MAGNETISM. The first important discovery in point of time, which laid the foundation of this new science, was made by Professor Oersted of Copenhagen, who found that the electrical current in the conducting wire connecting the opposite holes of a galvanic battery acted upon a magnetised bar, and tended to turn it round as if exercising a tangential force. In fact, when a magnetised needle is placed near a conducting wire in the plane of the magnetic meridian, and the battery is powerful, it is observed that the needle will turn round at right angles to the direction of the current. Before this time a connection between electricity and magnetism had been suspected, or rather believed, by Franklin, Beccaria, and others, from the well-known circumstance

that the poles of the compass-needle had been frequently reversed during thunder-storms, and that the same effect could be produced by electrical discharges; but to Oersted's discovery, followed up as it has been by Ampère, Faraday, Barlow, Arago, &c., we must ascribe the source of those accurate data by which the actions of the earth on magnets, of magnets on each other, of conducting wires on magnets, and of the earth on conducting wires, are reducible to similar and simple principles of action.

In order to discover the law of action of a current on a magnetic element, Biot and Savart used a small magnetic needle, guarded from the agitations of the air, and having the action of terrestrial magnetism neutralised by a bar, thus subjected only to the immediate action of the conductor. Having acquired the position indicated by Oersted, the times of its small oscillations were observed, and from these it was inferred that the force exercised by each element of the conductor on the magnetic needle must, like all known forces, vary inversely as the square of the distance. Biot also showed that, when the distance was given, the force was proportional to the sine of the angle formed by each element of the current with the right line joining the middle of that element with the middle of the needle.

M. Arago observed that small fragments of soft iron were attracted by the conductor of the galvanic pile, and the same current imparted permanent magnetism to small needles of steel. The needle should be placed perpendicularly to the joining wire or current, or, which is better, be introduced in a helix, the discharge of the current through which instantaneously magnetises the needle. The experiments of Dr. Faraday have proved that ordinary electricity is capable of producing a continued deviation of the needle from its mean place.

The magnetising force of the current is transmitted without sensible loss through isolating media, as glass, wood, &c., but is much altered by the interposition of conducting plates, a result similar to the development of ordinary electricity by the influence of electrised bodies.

The discovery of the currents produced by volta-electric induction is due to Dr. Faraday. With about 203 feet of copper wire he formed each of two helices, and twisted them about a cylinder of wood, making one in communication with a galvanometer and the other with a powerful voltaic pile. The moment the communication was established, the galvanometer deviated; then, after some oscillations, returned to its place, and again deviated the instant this communication was broken: hence the directions of the inducing and induced currents are contrary, while that generated at the interruption of communication or cessation of the inducing current is directed the same way with the latter.

The same philosopher has also succeeded in producing currents by the influence of magnets, his experiments with the great magnets of the Royal Society proving most manifestly the disengagement of electricity by the influence of ordinary magnetism. The extraction of the electrical spark from the magnet is now pretty generally exhibited, as also the continued rotations produced by terrestrial magnetism.

The following works may be consulted on this subject: Gilbert's *Annalen; Memoirs* by Erman of Berlin, Frechtl, Hansteen, &c.; the volumes of the *Philosophical Transactions*, containing Faraday's *Researches;* Professor Cumming's *Electro-Dynamics*, and his papers in the *Annals of Philosophy;* Barlow's article on Electro-Magnetism in the *Encyclopædia Metropolitana*. See also TELEGRAPH, ELECTRIC.

ELECTRO-METALLURGY. In this beautiful modern department of manufacture, articles in gold, silver, and other metals are made chiefly by galvanic agency. When a galvanic current is passing through a solution of a metallic salt, it separates the metal from the other chemical elements, and precipitates it in a fine layer, which solidifies into a film or sheet. [BATTERIES; VOLTAGRAPHY; VOLTAIC ELECTRICITY.] When an ornament of white metal is to be coated with silver by this means, the metal foundation, properly prepared, is dipped into a chemical solution of silver, and a galvanic current is passed through it. The result of this action is, that the solution is decomposed, and a fine film of metallic silver becomes deposited on the surface of the article suspended in the liquid; the thickness of the deposited layer being determined conjointly by the duration of the immersion, the strength of the solution, and the strength of the current. In the progress of the operation the solution becomes exhausted of its silver; and, to keep up the supply, plates of pure silver are suspended in it; the silver dissolves in the liquid as rapidly as the deposition on the articles takes place, atom for atom. If the article—whether a piece of table-plate, a button, or a trinket, is to be coated with gold instead of silver, a process generally similar to the above is followed; the nature of the solution being the chief point of difference.

Articles of solid metal are sometimes wholly made in a similar way. A wax model, exactly representing the article to be made, after being properly prepared, is suspended in a tank containing a chemical solution of copper. Galvanic agency is then resorted to, to deposit a layer of copper on the surface of the model, and this layer is made of such a thickness that when the waxen model is melted out from within it, the copper may be able to retain its shape unsupported. The inside of the copper shell represents a mould of the outside of the article to be manufactured. The exterior of the copper is protected by a resisting composition, and it is then suspended in a tank containing a solution of silver (or gold, as the case may be); the galvanic current causes the deposition of the gold or silver on the inside of the copper mould, deposition on the outside being prevented by the resisting composition. When a sufficient thickness of the precious metal is thus obtained, the copper mould is exposed to the action of an acid which gradually eats it away without injuring the gold or silver beneath. The article then consists solely of pure gold or silver, wholly deposited by galvanic

action. The atoms of metal cohere so well together, that the article has a sonorous 'ring,' and is capable of being hammered, burnished, &c.

Mr. Dent has coated the balance springs of chronometers with gold, by the electro-metallurgic process, to protect them from damp. Professor Christie has proposed the same treatment for magnetic needles. Medallions are sometimes coated with copper as a means of preservation or of beautifying. The medallion is first coated with black-lead, and then exposed to a solution of copper (in the state of sulphate or some other salt), the metal of which is precipitated on the medallion by a galvanic current. Fruit, small twigs, leaves, seeds, and other vegetable specimens, may be similarly coated with copper; either for ornament or for the purpose of illustrating the size and form of the object. Insects too, such as butterflies, may be thus coated with a metallic film; and it is a striking proof of the equability with which the particles of metal arrange themselves, that the exquisite framework of the insect's wings is exhibited almost as distinctly as in the natural state. Ornamental baskets, whether made of wicker or of wire, are coated in a similar manner. So likewise are lace and other articles made of woven fibres. For the application of this beautiful art to the copying of engravings, see VOLTAGRAPHY.

ELECTRO-PLATING. [ELECTRO-METALLURGY.]

ELECTRO'METER. This term strictly applies only to instruments adapted to measure electricity. It has however been applied in a more extended sense to those which only indicate the presence of that fluid; but these are more correctly denominated *Electroscopes*.

Of the former kind is the Balance of Torsion invented by Coulomb; and the following is a brief description of this delicate instrument.

A very fine metallic wire, or, which is better, a single thread of silk taken from the cocoon, is fixed at the upper extremity, and at the lower it supports horizontally a fine needle made of a good non-conducting substance, as gum-lac, to one of the ends of which is attached the body to be electrised, as for instance a small ball of elder-pith. At the top of the suspended string there is placed a plate moveable with friction on a glass cylinder, in which the thread is contained, by which any requisite torsion may be given to the thread, which is shewn by an index on a micrometer screw. The body of the large cylinder which incloses the needle is also surmounted with a graduated brass circle. In electrical experiments the index of the micrometer is on its division zero, and the plate is turned round to bring the needle and pith-ball to the zero of the graduated circle on the string. Again a second ball is attached to the extremity of a fine isolating cylinder inserted in the apparatus so that both balls may be in contact without pressure. The balls are then electrised by communication with some isolated and electrised body, and as they acquire similar electricities, repulsion immediately takes place. That attached to the needle being moveable with it, carries it round through a certain angle, and after some oscillations settles at a definite position with respect to the fixed ball, this angle being indicated by the graduated arc; the elastic force of torsion is then in equilibrium with the moving force of repulsion between the balls, and hence a measure of the latter can be obtained. In such experiments only a very small electrical charge is communicated to the balls.

In a similar manner the law of attraction between differently electricised balls has been ascertained; and it results that the forces both of repulsion and attraction vary inversely as the square of the distance between the balls. [TORSION.]

Various instruments have been constructed for estimating approximatively the total quantity of electricity in the charge of an electrised body, but the most precise instrument of this description is one invented by Sir W. S. Harris; its description will be found in his paper on electricity in the '*Philosophical Transactions*.'

Electroscopes indicate the presence of very small quantities of electricity, and therefore are generally used with a condenser; as the gold-leaf Electroscope, consisting of two small portions of gold-leaf laid flat together; and when made to communicate by a conducting stem with a condenser which has acquired electricity from a very feeble source, they diverge from each other. They have been also employed to indicate atmospheric electricity.

Similar instruments have been constructed for the purpose of indicating the existence of electrical currents of but slight intensity, such for instance as those generated by inequality of temperature.

ELECTROTINT, ELECTROTYPE. [VOLTAGRAPHY.]

ELECTRUM. [GOLD—*Alloys*.]

ELECTUARY, a term applied to a compound of various medicines, united by means of syrup, or wine, and formed into a soft mass, nearly of the consistence of honey. Substances in the state of powder or extract are thus combined, and rendered capable of being swallowed without their natural taste, which may be unpleasant, being perceived.

ELE'GIT, so called from the entry of its award upon the roll, 'quod elegit sibi executionem' (because the plaintiff hath chosen the writ of execution), is a writ of execution given by the statute 13th Edw. I., cap. 18, to parties recovering upon judgments for debt or damages, or upon the forfeiture of a recognizance in the king's courts. It is directed to the sheriff of the county where the defendant's property lies, and commands him to make delivery of a moiety of the debtor's lands and all his goods (except oxen and beasts of the plough) to the plaintiff. If the goods are insufficient to pay the debt, one half of the debtor's lands are delivered to the creditor, and he becomes a *tenant by elegit*, and he occupies the land until the whole of his debt and damages are satisfied. The tenant's interest in the land is a chattel.

Every subsequent judgment creditor takes a moiety of what is left; the last moiety being reserved according to the feudal law for the lord to distrain for his services.

Previous to this statute, a judgment creditor could only have obtained satisfaction of his debtor's goods by the writ of *fieri facias*, and of the present profits of his lands by a *levari facias;* but as the latter writ did not extend to the possession of the lands, a defendant might alien the property, and thus deprive the plaintiff of his remedy.

Copyhold lands are not liable to be extended under an elegit.

When the judgment is satisfied out of the extended (that is, estimated) value of the estate, the defendant may recover his lands either by an action of ejectment, or by a suit in equity.

ELEGY, from the Greek *élegos* (ἔλεγος, whence ἐλεγεῖον), in English commonly means a short poem composed on some person's death; also, in a more general sense, any mournful or serious poem, as, for instance, Gray's 'Elegy in a Country Church-yard.' The Greek word *élegos* is properly a strain of lament; *elegion*, the form of versification in which such strains were first composed by the Greeks, that is, the combination of an hexameter and a pentameter (commonly called long and short) verse; *elegeia*, a poem made up of such verses. The elegiac was the first variation from the hexametral, or epic, measure; and the change of form corresponded with a change of subject: the poet in epic composition keeping himself and the workings of his own mind out of sight; while, on the contrary, the free and full expression of the poet's feelings, as affected by external circumstances, constituted the essence of the Greek elegy. Hence arises its variety; the elegies of Callinus and Tyrtæus (the earliest) being political and warlike; of Mimnermus, contemplative and melancholy; of Theognis and Solon, moral and political. The elegiac was also a favourite measure for epigrams. [EPIGRAM.]

Catullus is the first Latin elegiac writer of any note; he was followed by Tibullus, Propertius, and Ovid.

ELEMENTARY ORGANS, in plants, are those minute internal parts out of which all the visible organs are constructed: they are always too small to be seen without the assistance of the microscope, and often require very high magnifying powers to be distinctly observed.

ELEMI, a resin obtained from the *Amyris zeylanica*, *Elæagnus Hortensis*, and other trees in the East Indies and elsewhere. It occurs in irregular-shaped small pieces, which run into masses, of a yellowish colour and agreeable odour. Elemi is recommended as an ointment, but is chiefly used to form pastilles, or to burn as incense.

ELENCHUS, the Latin form of the Greek *elenchos* (ἔλεγχος), and commonly translated by the words *argumentum*, *inquisitio*, *confutatio*, and *demonstratio*, is a term of frequent use in the Aristotelian system of logic, and signifies argument, replication, refutation, or the point, subject, or nature, of dispute or demonstration. Aristotle defines *elenchos* as 'a syllogism of contradiction,' that is, an argument alleged in opposition to another; and Mr. Thomas Taylor, in his translation of the 'Organon,' considers the Greek term to be precisely equivalent to *Redargutio* in Latin. In the last two books of the 'Organon,' entitled Περὶ τῶν Σοφιστικῶν Ἐλέγχων, Aristotle classifies and discusses the various kinds of sophistical elenchi, or modes of argument, used by contentious sophists. The sophism which is designated *Ignoratio Elenchi*, that is, a real ignorance of, a mistaking, or sinister deviation from, the argument or question under discussion, consists in proving something irrelevant, and which, as it may be true without affecting the truth of the real proposition, with which it has no necessary connexion, does not determine the question. Aristotle includes under this designation the introduction of anything extraneous to the point in dispute; the disproving of what is not asserted, as well as the proving of what is not denied. In all cases of irrelevant conclusion, when something is proved which does not in reality contradict the adversary's proposition, the latent fallacy is best exposed by showing that both propositions may be equally true.

ELEO'CHARIS, a genus of plants belonging to the natural order *Cyperaceæ*, and the tribe *Scirpeæ*. There are three species of this genus, known by the name of Spike-Rushes, found in Great Britain. *E. palustris* grows in marshy places, forming sometimes a large proportion of the peat found in bogs. *E. multicaulis* and *E. acicularis* are found in damp places upon heaths.

ELEPHANT (in Latin *Elephas* and *Elephantus;* in Greek Ἐλέφας, in Spanish *Elefante*, in Italian *Elefante*, in French *Eléphant*, in German *Elephant*), the name of the well-known genus which forms the only living type of the family of *True Proboscidians*, or Pachydermatous Mammalia with a proboscis and tusks, and which is the largest of existing terrestrial animals.

Of this genus only two species are extant; one peculiar to India, Ceylon, Cochin China, Siam, Pegu, Ava, and the larger islands of the Indian Archipelago, the *Elephas Indicus* of Cuvier; the other is a native of Africa, from Senegal to Caffraria, the *E. Africanus* of Cuvier.

Cuvier observes, 'We know not whether this latter species extends also throughout the eastern coast of Africa, or whether it is replaced there by the preceding.' As far as is at present known, we have no reason to suppose that the Asiatic species inhabits any part of the African continent. Before adverting more particularly to the two species in question, a few observations, necessarily brief, on the more remarkable structural peculiarities common to both, may be admissible.

The *Proboscis* or *Trunk*.—The enormous size of the tusks (incisor teeth), their position, and the development of the alveoli necessary for their reception, and which advance before, and as it were hang over the mouth, render it necessary that some expedient be adopted in order to enable the elephant to obtain its food; and this the more so as the vast weight of the head and tusks is necessarily combined with such a shortness of neck, that it appears as if the head were fixed to the front of the body without the intervention of a decided neck. The limbs, like thick columns, are organs alone of support and locomotion. They

cannot be used, as are the paws of the squirrel, or of others of the unguiculate tribe of mammalia. The elephant cannot browze on the leaves of trees or bushes, as do the rhinoceros and hippopotamus; for the tusks and their alveoli prevent the application of the mouth, and, what is more, shorten the nasal bones so that the nasal apertures of the skull above the alveoli seem as if pierced in the forehead. An upper lip of the common form, as in the horse or the rhinoceros, is out of the question. Nature therefore, never inharmonious with herself, has met all these points, and endowed the elephant with a proboscis, at once a delicate organ of prehension, a strenuous grasper, an arm of offence, and a pump for the suction of water. By its means the elephant feeds itself and slakes its thirst, or throws a shower-bath over its own body, or over that of some unfortunate offender.

End of Elephant's Trunk (profile).

The proboscis or trunk of the elephant may be regarded as a muscular prolongation of the nostrils, into which the upper lip also is blended. This proboscis is of a tapering subconical form, and has internally two perforations. On the upper side of the extremity, immediately above the partition of the nostrils, is an elongated process, which may be considered as a finger; and on the under edge is a sort of tubercle which acts as an opposable point, in short, as a thumb. Composed of thousands of muscles variously interlaced, this organ possesses the most complicated powers of mobility, of extension, and of contraction, and is besides endowed with exquisite sensibility. The length of this organ, from 6 to 8 feet according to the height of the individual, supplies the place of a long neck; and by its means the elephant not only gathers its food and feeds itself, as we have said, but also supplies itself with drink. Sucking up the water till the two cavities of the proboscis are filled, the animal curves it round, inserts the extremity into its mouth, and drives the water into its capacious throat. The young elephant however, be it observed, sucks in the usual way; the teats of the female being placed between the two fore legs.

Skull.—The skull of the elephant appears to be enormously capacious, and the forehead nobly developed; but this is all deceptive. The two tables of the bones forming the anterior part of the skull are separated from each other by a wide interval, which is divided into numerous cells, the whole occupying an immense space, behind and below which is the cerebral cavity, which, compared with the magnitude of the cranium, is small: hence it is that a ball striking the centre of the elephant's forehead will either pass over the cerebral cavity or lodge in the maze of cells, without causing the animal to drop.

Skull of Indian Elephant.

Skull of African Elephant.

Dentition.—The teeth consist only of molars, and incisors called tusks: there are no incisors in the lower jaw. The molar teeth are composed of ribands of osseous substance, cased in enamel, and imbedded in a mass of cement, cortical substance, or *crusta petrosa*. These ribands, which are distinctly seen on the crown of the molars, are transverse, and pass from side to side. A single grinder may in fact be regarded as made up of a number of distinct teeth consolidated into one mass. The process by which the separate constituents of the molars are deposited and arranged in the capsule is admirably described by Cuvier in his 'Ossemens Fossiles,' vol. i. p. 31. The molars of the elephant when perfected are not permanent, but are shed in due succession for six or eight times, perhaps oftener; and this not from the rising up of a fresh tooth below the one it is to succeed, but by the rising up of a new one behind the old one, and which, gradually becoming developed, advances forwards as the old one wears away, till its last remnant is pushed out. Hence more

than one molar tooth and the anterior portion of another (on each side) are never to be seen through the gum of the elephant: as the latter developes, the former diminishes by attrition and absorption. Each succeeding tooth is larger than its predecessor. As the laminæ of the new tooth are successively perfected, they advance, and become worn long before the old ones are ready to fall; so that an elephant's molar tooth is never seen in a perfect state; for if it be not worn anteriorly, the posterior part is not formed, and the fangs are wanting; nor is the structure of the back part of the tooth perfected till the anterior portion is gone.

The tusks or upper incisors of the elephant are destitute of true roots, and have no other union to their deep sockets than that of close contact; they resemble a nail driven into a plank, and by gentle and continued pressure may have their direction altered. They consist of concentric layers of ivory, and grow by the continued deposition of these layers, added internally, for the pulp or core, which deposits the ivory, fills the cavity at the base of the tusk, and arises from the bottom of the socket; it is of great size, and has no organic union with the tusk it secretes. We have seen several instances in which bullets have, on cutting the tusk, been found imbedded in the ivory, to the astonishment of those who know not the manner in which the tusks are produced. In these instances the bullet has entered the socket and lodged in the bottom of the hollow base of the tusk, and the pulp or core in that hollow has kept covering it with layer after layer of ivory, the tusks advancing in due proportion, till at last, from being in the hollow, the bullet attains the solid centre of the tusk, being moved farther and farther forwards by each deposit of ivory within its hollow base.

The tusks are not shed as are the molars, but a permanent pair succeed a deciduous pair shed between the first and second year of existence.

The tusks of the elephant vary in size and curve. In the African species they are generally very large, sometimes even in the female; but in the female of the Asiatic species they are small. Mr. Corse informs us that one variety of Asiatic elephant is characterised by straight tusks pointing downwards; it is termed *Mooknah*. Another variety has large heavy tusks, inclining more or less upwards, and is termed *Dauntelah*. Independently however of the shape and size of the tusks in the male, the Asiatic species is divided into two main or principal castes, between which there are many degrees of intermixture. These two castes are called respectively *Coomareah* and *Merghee*. The Coomareah is a deep-bodied, strong, compact elephant, with a large trunk, and legs short in proportion to the size of the animal. The Merghee, when fully grown, is generally taller than the former, but he has not so compact a form, nor is he so strong or so capable of bearing fatigue; his legs are long, and having a lighter body, he travels fast; but his trunk is both short and slender in proportion to his height. A large trunk is always esteemed a great beauty in an elephant, so that the Coomareah is preferred not only for this, but for its superior strength, which enables it to undergo great fatigue and carry heavier loads.

The tusks of the Indian elephant seldom exceed 72 lbs. in weight; some are not more than 50 lbs. There are however in London tusks, probably from Pegu or Cochin China, which weigh 150 lbs. The largest recorded in Cuvier's table was a tusk sold at Amsterdam, which weighed 350 lbs.

Skeleton.—In the Asiatic elephant the skull is more elevated and pyramidal than in the African, and the front is concave. In both, the nasal bones are rudimentary; the lachrymal bones are entirely wanting. The spinous processes of the dorsal vertebræ are extremely long and stout for the attachment of the suspensory ligament of the head (*ligamentum nuchæ*). The number of ribs (and consequently of dorsal vertebræ) is 19 on each side, 14 true and 5 false; but sometimes 20, 15 true and 5 false. Lumbar vertebræ, 3. The bones of the limbs bear almost perpendicularly on each other, and the thigh bone is destitute of the *ligamentum teres*. The toes are five on each foot, complete in the skeleton, but so buried in the coarse skin of the limb in the living animal, that the horn-clad tips alone are visible, and these not always, for in the Asiatic species four nails only appear on the hind feet, and in the African species only three.

Senses.—The elephant possesses the senses of sight, hearing, taste, and smell, in great perfection; and its proboscis is an organ of touch and an instrument of prehension. The eye is small, but quick and lively; the tongue is smooth and pointed.

Reproduction.—The female brings forth only a single offspring at a birth. The period of gestation is 20 months and about 18 days (Asiatic species). A young male Asiatic elephant at the time of its birth was 35 inches high. In one year he grew 11 inches (3 ft. 10 in.); in the 2nd year, 8 inches (4 ft. 6 in.); in the 3rd year, 6 inches (5 ft.); in the 4th year, 5 inches (5 ft. 5 in.); in the 5th year, 5 inches (5 ft. 10 in.); in the 6th year, 3½ inches (6 ft. 1½ in.); in the 7th year, 2½ inches (6 ft. 4 in.). The elephant attains to its full stature, according to Mr. Corse, between the ages of 18 and 24. The East India Company's standard for serviceable elephants, in Mr. Corse's time, was 7 feet and upwards, measured at the shoulder. Few adult males exceed 9 feet 6 inches in height, and many are under this mark. Some attain to the height of 10 feet, and one which belonged to Asaph Ul Dowlah, vizier of Oude, was 10 feet 6 inches at the shoulder, or 12 feet 2 inches from the ground to the top of the head.

Habits and Utility to Man.—In a state of nature the elephant lives in herds, under the conduct of adult males. They feed on herbage, maize, twigs, and roots, and often commit serious depredations. From time immemorial the art of capturing wild elephants and training them to serve man has been practised and is still continued in India. Formerly elephants were employed as engines of war, and turrets bearing armed men

were fastened on their backs; they were also taught the executioner's dreadful trade; they were adorned with trappings and paraded to swell the state of princes; they bore the oriental sportsman in the great hunting matches; they were educated as combatants in the arena, being matched against each other, and the tiger; and they were trained as beasts of burden. The Romans not only slaughtered these animals in the games of the circus, but taught them to dance and perform antics, in order to amuse a rude multitude. In our days, an elephant has delighted a British audience by its unwieldy performance on the boards of the theatre. At all times the ivory of the elephant has been in request, and is still an important article of commerce. In Africa the flesh of the elephant is relished by many tribes. The ancient Romans considered the trunk as delicious, and Le Vaillant speaks of the foot as a dish for a king.

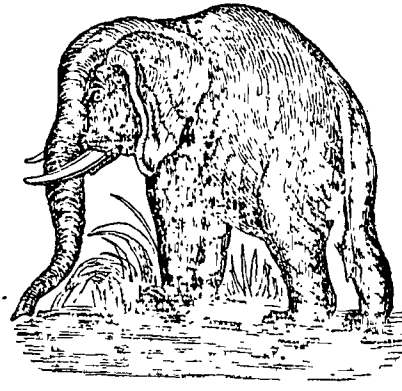
It was of the African elephant that the Carthaginians anciently availed themselves as an arm of war; and this was the species which Hannibal carried into Italy, and with which the Romans first became practically acquainted. The elephants exhibited in the Roman arena by Cæsar and Pompeius were African.

The distinctions between the Indian and African Elephant may be summed up as follows:—

Elephas Indicus.—Head elevated and pyramidal, front concave, molars presenting on their surface transverse, parallel, wavy ribands of enamel; ears small or moderate, pendant; nails on the hind feet, four; tail tufted, with a brush of bristles on each side at the tip.

Asiatic Elephant (*Elephas Indicus*).

Elephas Africanus.—Top of the head low and rounded, front rather convex; ears of immense volume, triangular, extending over the shoulder, and hanging with the tips below the throat; molar teeth with the bands of enamel forming lozenges on the surface, touching each other along the centre of the tooth; nails on the hind feet three; stature lower than that of the Asiatic.



African Elephant (*Elephas Africanus*).

For an admirable history of the Elephant, see 'Menngeries,' in 'Library of Entertaining Knowledge;' also Mr. Corse's Paper, in 'Asiatic Trans.,' vol. iii.

Fossil Species.—The third and fourth divisions of the tertiary fresh-water deposits abound in extinct species of recent genera, and among them are the remains of fossil elephants of more than one species. The alluvium, the crag, the ossiferous caverns, the osseous breccias, and the subapennine formations afford the most numerous examples. Fossil bones of the elephant are common in our island, and in various parts of Europe, Asia, and America. Teeth and tusks abound in Russia and Siberia and the arctic marshes; the latter in so high a state of preservation that they constitute an article of commerce: indeed, Siberian Ivory forms the principal material on which the Russian ivory-turner works.

The Siberian elephant, or Mammoth of the Russians (*Elephas primigenius*, Blumenb.), approximated to the Asiatic species, but its molars have the ribands of enamel narrower and straighter, and the alveoli of the huge tusks longer in proportion, the lower jaw being more obtuse anteriorly. An individual of this species, imbedded in ice, with the flesh, skin, and hair in a state of the most entire preservation, became disengaged from a block of ice, at the mouth of the river Lena in Siberia. It was first observed in 1799, and in 1803 was set free by the melting of the ice. The skin was of a dark tint, and covered with reddish wool and blackish hairs. The hair consists of two sorts, common hair and bristly, and of each there are several varieties, differing in length and thickness. Parcels of the hair, and a portion of the skin covered with hair, are preserved in the Museum of the Royal College of Surgeons, London. The skeleton is in the Museum of the Academy of St. Petersburg. This is not a solitary instance on record of the preservation of the Mammoth in ice, in the same region bordering the Polar Sea. ('On the Mammoth or Fossil

Elephant found in the Ice at the mouth of the River Lena, in Siberia, with a lithographic plate of the Skeleton,' 5th vol. of the 'Memoirs of the Imperial Acad. of Sciences of St. Petersburg,' London, 1819, 4to.) Fischer indicates the following species of fossil elephants; viz. 1, *E. mammonteus* (*E. primigenius*); 2, *E. panicus*; 3, *E. proboletes*; 4, *E. pygmæus*; 5, *E. campylotes*; 6, *E. Kamenskii*. M. Nesti proposes a species under the name of *E. meridionalis*, whose remains have been found in a fresh-water formation in many places of Italy, and especially in the Val d'Arno. Captain Cautley has brought home the relics of fossil elephants found by him, among those of other mammalia, in the Sewalik mountains at the southern foot of the Himalayas, between the Sutlej and the Ganges, partly lying on the slopes among the ruins of fallen cliffs, and partly in situ in the sandstone.

Fossil relics of elephants are found in North America with those of the Mastodon. Dr. Haslar is of opinion that there are two species peculiar to the United States. (See Cuvier's 'Ossemens Fossiles,' and Owen's 'History of British Fossil Mammalia.') A fine collection of the skulls, teeth, and bones of fossil elephants, from different localities, are preserved in the British Museum. The tusks of one skull in particular are of enormous length, and indicate the vast power of the animal which once sustained them. A casual examination of these skulls will serve not only to prove their entire distinctness from the two living species, but also that several species once existed in countries from which they have long been banished; for example, in our own island, if it was then an island, and that too at a comparatively late geological epoch, though very far distant as it regards the present aspect of the surface of the land, or the remotest human traditions. Their relics occur in superficial deposits, and their numbers prove that herds must for ages have occupied former forests, plains, and marshes, in company with other massive pachydermata, which have likewise perished from the face of the earth, leaving their osseous relics to testify of their once having existed, where, in the course of revolving years, cities have arisen, and man has usurped the land which formed their sepulchres.

ELEPHANTA, or *Shaporee*, is a small island about 7 miles in circumference, situated between the island of Bombay and the Mahratta shore. The name Elephanta was given to the island by the Portuguese, from the figure of an elephant cut out of the solid black rock on the acclivity of a hill about 250 yards from the landing-place, and which is a conspicuous object in approaching the island. The elephant is about three times as large as life, rudely sculptured, and very much dilapidated by the weather. An animal on the back of the elephant has been conjectured to be a tiger, but has no longer any distinguishable shape. The island contains also a large temple-cave, which is about half-way up the steep ascent of the mountain or rock out of which it is excavated. The length of this temple, measuring from the entrance, is 130 feet, and its breadth 123 feet; the floor not being level, the height varies from 15 feet to 17½ feet. The roof is supported by 26 pillars and 8 pilasters, disposed in four rows. Along the sides of the temple are cut between forty and fifty colossal figures, varying in height from 12 to 15 feet; none of them are entirely detached from the wall. The statues are designed with great spirit, and the execution has much beauty and elegance. Facing the main entrance is an enormous bust with three faces, reaching from the pavement to the ceiling, which has been conjectured to be the Trimurti, or Hindoo Trinity, Bramah, Vishnu, and Siva; but Bishop Heber was of opinion that it is Siva only, who is sometimes represented with three faces. The pillars and figures have been much broken and worn away by the weather, and the process of decay is still going on. Nothing is known as to the time when the cave was excavated, nor whether it ever had an establishment of priests. Bishop Heber conjectures it to be a temple to Siva, and that the sculptures have been made within a period more recent than might be imagined from their dilapidated state.

ELEPHANTI'ASIS (ἐλέφας and ἐλεφαντίασις), *Elephant Disease*, so called partly on account of some supposed resemblance of the diseased skin to that of the elephant, and perhaps also from the formidable nature of the malady. It is disgusting to the sight, says Aretæus, and in all respects terrible, like the beast of similar name.

The term is applied to two different diseases; first to a disease of the skin, which occurs in hot climates, and more particularly where agriculture and the arts of civilization are imperfectly advanced; and secondly to a disease of the leg, which becoming enormously tumid, is conceived to bear some resemblance to the leg of an elephant.

The first distemper, elephantiasis properly so called, is a tubercular disease of the skin. The tubercles present a shining appearance; they are of different sizes, and are of a dusky red or livid colour on the face, ears, and extremities. The tubercles are accompanied with a thickened and rugous state of the skin, a diminution or total loss of its sensibility, and a falling off of all the hair excepting that of the scalp. The disease is wholly unknown in this country. It is described as slow in its progress, sometimes continuing several years without materially deranging the functions, but gradually producing an extraordinary degree of deformity.

The large misshapen leg, which is also often termed elephantiasis, arises from a repeated effusion and collection of a lymphatic and gelatinous matter in the cellular membrane under the skin, in consequence of inflammation of the lymphatic glands and vessels. In England it is often called the Barbadoes Leg.

In this country the disease is only seen in its inveterate stage, after repeated attacks of the fever and effusion have completely altered the organization of the integuments of the limb, and rendered it altogether incurable.

(Dr. Bateman's *Practical Synopsis of Cutaneous Diseases.*)

ELEPHA'NTOPUS, a genus of plants belonging to the natural order *Compositæ*, and the

sub-order *Corymbiferæ*. *E. scaber* is common in almost all parts of India, in dry elevated positions. It has a stem a foot high, with the heads of pale red flowers on long stalks. The roots are fibrous. Both the roots and the leaves are reputed to have active medicinal properties. The natives on the Malabar coast use a decoction of them in cases of dysuria. There are other species natives of South America and the West Indies.

ELETTA'RIA, a genus established by the late Dr. Maton of the plant yielding the lesser cardamoms. The genus belongs to the natural family *Scitamineæ*, or *Zingiberaceæ* of some authors. Besides this it includes three other species, of which one, *E. cardamomum medium*, is a native of the hilly countries in the vicinity of Silhet.

Elettaria Cardamomum is a native of the mountainous districts of the coast of Malabar, especially above Calicut, in the Wynaad district, between 11° and 12° of N. lat., where the best are produced. The cardamom plant delights in moist and shady places on the declivities of the hills. It is cultivated from partings of the root in the district of Soonda Balaghat, but the fruit is very inferior; the best grows in a wild state. The tree-like herbaceous plants attain a height of from 9 to 12 feet. The root is as tortuous and tuberous as that of the ginger. The fruit is ripe in November, and requires nothing but drying in the sun to be fit for commerce.

Species of *Amomum* yield the other kinds of cardamom.

ELEUSIS, a celebrated town of Attica, on the borders of Mégaris. In very ancient times it is said to have been an independent state, and to have carried on a war with Athens, by the result of which it became subject to that city. Eleusis owed its celebrity in the historical age to its being the principal seat of the mystical worship of Deméter, the Roman Ceres. This worship subsisted at Eleusis from the earliest period of history to the time of Alaric. Eleusis stood near the northern shore of the Gulf of Salamis. Its port was small and circular, and formed by two piers running out into the sea. Traces of a theatre have been found on a hill about half a mile from the sea. The temple of Demeter was commenced by Ictinus, in the time of Pericles, and finished by Philo under the auspices of Demetrius Phalereus. It was originally a Doric building in antis, but was afterwards changed into a decastyle temple, with fluted columns. The upper part of an admirably executed colossal statue of Ceres, or Proserpine, brought from Eleusis by Dr. E. D. Clarke, is now in the vestibule of the public library at Cambridge. A modern village on the site is called Lefsina.

ELEUSI'NIA, the great mystic festival of Deméter celebrated at Eleusis in the month Boëdrómion. The lesser mysteries were celebrated in Elaphebólion at Agræ, on the Ilissus, and were a sort of preparation for the Eleusinia. The great festival began on the 15th Boëdromion, and lasted nine days. The initiation consisted in certain solemn rites. Every Athenian was obliged to pass through these ceremonies once in the course of his life. Bastards, slaves, and prostitutes, as well as strangers, and in later time Christians and Epicureans, were excluded from the Eleusinia. To reveal any of the mysteries, or to apply to private purposes any of the hallowed solemnities, was considered a capital crime. The priests at Eleusis belonged to the house of the Eumolpidæ.

ELGIN, the county town of Elginshire, is situated on the road which connects it with Forres on the W. and Fochabers on the E. The small river Lossie passes near, in a winding course on the western and northern sides, and is crossed by one iron bridge and three stone bridges. The town consists of one main street, extending nearly a mile, and numerous narrow lanes which intersect the main street at right angles, and contain houses of ancient construction. Elgin, at the end of the 10th century, was an important place, with a royal fort. The earliest charter was granted by Alexander II., in 1234. At a remote æra the neighbourhood was adorned with ecclesiastical establishments of monks and friars. One of the most interesting and magnificent ruins in Scotland is the cathedral of Elgin, which was founded in the year 1244. In 1390 the original structure was destroyed by fire. It was immediately rebuilt in a style similar to that of the cathedral of Lichfield, but on a scale of greater magnitude, and with more elaborate ornaments. The regent Morton, in 1568, having stripped off the lead of the roof to procure money for the payment of his troops, this venerable specimen of architecture and sculpture was left to decay. In 1711 the great central tower fell to the ground; but the two western turrets, the walls of the choir, and parts of the nave and transept are still standing. The loftiness of the fabric, the symmetry and unity of design, and the great profusion of sculpture, must excite admiration of the skill and perseverance of the artists. A college was attached to the cathedral, and included within its walls the house and gardens of the bishop, and those of 22 canons. Part of the wall, which had four gateways, and was 900 yards in circuit and four yards in height, yet remains. On the south side of the town are the ruins of a convent of Grey Friars, and on a hill at the west are the remains of an ancient fort. The Elgin Institution for the support of old age and the education of youth, is a handsome quadrangular building, at the eastern entrance, surmounted with a circular tower and a dome. The building, play-grounds, and shrubbery cover an area of about three acres. The objects of this charity are threefold: an almshouse for age and indigence; a school for the support and education of labourers' children; and a free-school solely for education. The inmates of the first class are generally about 10, of the second class 40, of the third class 230. The new church in the centre of the town is one of the most elegant in the north of Scotland. It has a richly ornamented cupola, and a Doric portico. Grey's Hospital is a similar structure, with a Grecian portico and a central dome. The places of public worship are numerous, and include an episcopal and a Roman Catholic chapel. The Elgin Academy consists of three parochial schools of very

superior character, and there are several smaller schools. There are several endowed charities, and other religious and benevolent institutions.

The population of the burgh, in 1841, was 3911. Elgin, in conjunction with Banff, Cullen, Inverury, Kintore, and Peterhead, sends one member to parliament. Population of the parliamentary district, 19,840.

ELGIN MARBLES, the designation given to a collection of ancient sculptures, chiefly from the Acrópolis of Athens, whence they were obtained by the Earl of Elgin (who had been the English ambassador to Turkey) between the years 1801 and 1812. This collection was purchased in pursuance of an act of the legislature, dated July 1st, 1816, for the sum of 35,000*l.*, and is now deposited in the British Museum, in a room built for its reception.

The Párthenon, or Temple of Minerva, at Athens, whence the more important of these sculptures were obtained, was built during the administration of Pericles, about the year B.C. 448. It was constructed entirely of white marble from Mount Pentélicus; Callícrates and Ictínus were the architects; and the sculptures were produced partly by the hand and partly under the direction of Phidias. Two models of the Parthenon have been placed in the room, one of which represents the building in its ruined state, and the other restored to its perfect state, with the sculptures occupying their proper places.

The sculptures of the Parthenon in the Elgin collection contain the Metopes, most of which represent the combats of the Centaurs and Lapithæ; a portion of the Frieze of the cella, which represents the Panathenaic procession; and the Statues, or parts of them, from the týmpana of the pediments.

The possession of the Elgin collection has established a national school of sculpture in our country, founded on the noblest models which human art has ever produced. A tribute of thanks is due to the nobleman to whose exertions the nation is indebted for it. If Lord Elgin had not removed them, the greater part would long since have been totally destroyed. In the last siege of Athens the Parthenon suffered additional damage.

ELGINSHIRE, formerly called *Moraysh*ire, a county of Scotland, is bounded N. by the Moray Frith, W. by Nairnshire, E. and S.E. by Banffshire, and S. by Inverness-shire. The greatest length, from N. to S., is about 40 miles; the breadth varies from 8 to 15 and 23 miles. The area is 840 square miles, or 536,600 acres, of which 120,000 acres are under cultivation, chiefly in the lower district of the county, and the remainder is under pasturage, or wood, or is unproductive. The population in 1841 was 35,012. Elginshire and Nairnshire conjointly return one member to the House of Commons.

The line of sea-coast measures about 35 miles, and presents in some parts precipitous rocks, in others a beach of level sands. The low country forms a plain varying from five to twelve miles in width from the sea-shore to the mountainous district, and extending from the river Spey to the western boundary. It is intersected by small ridges running nearly parallel with the line of coast. On the southern course of the Spey are some considerable plains. The rest of the country is hilly.

The rivers are the Spey, the Lossie, and the Findhorn, which flow in a north-east and nearly parallel course to the sea. The Spey has its source in the south-west part of Inverness-shire, and with its branches it discharges into the sea a greater quantity of water than the Thames. The devastation occasioned by its great overflowings in 1829 is described by Sir T. D. Lauder in his work on the Great Floods in Moray. The Findhorn rises also in Inverness-shire, and passes through Elginshire near the western boundary. The Lossie is formed by the confluence of numerous streams in the centre of the shire; it passes to the north of the town of Elgin, and falls into the sea on the eastern side of Loch Spynie. There is a good deal of salmon fishing in the Spey and the Findhorn. The county contains several lakes, of which one has been drained for cultivation.

A large proportion of Elginshire is covered with forests and plantations, chiefly of Scotch fir and larch. The rocks in the south consist of granite, felspar, mica, sandstone, slate, gravel, and rock crystal. The banks of the Spey towards its mouth exhibit secondary rocks of red sandstone which dip into the basin of the Moray Frith, and extend westward throughout the northern plain of the county. Numerous large granitic boulder stones, which are used for building, are found far from their parent rocks. Many large and inexhaustible quarries of freestone are worked, especially near the coast. One or two quarries of slate supply the county with roofing materials. Neither coal nor any metallic ores of importance are found. Peat is dug in various places.

The soil of the lowland district is remarkably fertile, and is especially adapted for the growth of wheat, oats, and barley, of which it produces many heavy and luxurious crops, a great portion of which is shipped for the Scotch and English markets. The climate of this part of the county is noted for its general mildness, dryness, and salubrity, owing, it is thought, to the low level of the surface, and to the absorbent sandy nature of the soil. The soil and climate of the southern highlands are less favourable for the cultivation of grain; and a great portion of the surface is still covered with native forests, or with uninclosed commons of furze and broom. Oats and barley were formerly the only kinds of grain produced; wheat, though now one of the staple articles of commerce, is of comparatively recent introduction, and still more recent is the cultivation of peas, beans, clover, grasses, turnips, and potatoes; yet the turnip husbandry is very extensively and successfully adopted, and potatoes are as common as in Ireland. Oats being the principal article of food consumed by the peasantry, they are given very sparingly to horses. All the bread used by the labouring classes is wholly of oatmeal made simply with water into flat cakes, and baked over a wood fire in a flat pan. Sheep and horses are reared, for the most part, only for domestic use.

The Cheviot breed of sheep has been extensively introduced to cross the native breed. The breed of native cattle has been improved by importations from Sky, Aberdeen, and Argyle.

The people of this county, as in most parts of Scotland, highly appreciate the advantages of early instruction. A well-attended and well-conducted parochial school exists in every parish, and it is a rare occurrence to meet with a youth of either sex, however humble, who is not able at least to read and write.

The chief articles of export from the county are corn, timber, whiskey, and salmon. Ships are built at the Spey mouth of fir grown on the banks of the river, which is very durable. The timber trade is one of the most flourishing in the county. The salmon sent from Elginshire to London has sometimes amounted in value to 100,000*l.* in one year.

There are many antiquarian remains in the county, comprising Druidical temples, Danish fortifications, and mediæval castles and churches. Among the principal are—King Sueno's Stone; the remains of Forres Castle, supposed to have been a royal residence of Duncan, and afterwards of Macbeth; the priory of Pluscarden; the castle of Loughnadurb; the ancient palace of the bishops of Moray; and the church at Birnie, one of the oldest places of worship in Scotland. There are also many fine baronial mansions in the county still inhabited.

The county town is Elgin. [ELGIN.]

Forres consists of one street, extending about a mile from east to west, and has a town-hall, church, and gaol. It is pleasantly and picturesquely situated on elevated ground, surrounded by verdant fields and wooded heights. The houses are neat and of modern construction, though some of an ancient date present here and there their pointed gables. The salmon fishery on the Findhorn gives employment to a few of the inhabitants; the rest belong chiefly to the agricultural class. Population, 2,844.

Fochabers is a small modern-built market town, with a population of 1,135, situated on the east bank of the Spey, about five miles from the mouth. The inhabitants are employed for the most part in manufacturing cotton, thread, and worsted.

Burghead is a pretty village, with neat accommodation for sea-bathers, and a population of 829. Its port is frequented by numerous vessels of about 80 tons burden.

(*New Statistical Account of Scotland.*)

ELIMINATION. This word is from *eliminare*, to drive out of doors, and it is used in mathematics to signify the formation of an equation or equations which do not contain a certain quantity, by means of given equations which do contain that quantity. Thus in so simple a case as $x = y$, $x = z$, if by means of these two equations we deduce the obvious result $y = z$, we have eliminated x, or formed a third equation in which x is not found.

ELIOT, JOHN, often called the apostle of the Indians, was a native of England, born in 1604. He was educated at the university of Cambridge, but having seceded from the established church and embraced the ministry, he emigrated, like many other sufferers for conscience, to New England, and arrived at Boston in 1631. He settled at Roxbury, near Boston, as minister of a small congregation, in which capacity he was zealous and efficient.

Having acquired the language of the Indians, he commenced his missionary labours, October 28, 1646, and pursued them with so much earnestness and success that in 1674 there were seven Indian praying-towns, containing near 500 persons, settled in Massachusetts, besides a still greater number of converts who were not settled.

Eliot translated the Old and New Testament and several religious treatises into the Indian tongue, which were printed for distribution chiefly at the expense of the Society for Propagating the Gospel; he also wrote a number of English works. Eliot lived to the age of 86, and resigned his pastoral charge at Roxbury only two years before his death, which took place in 1690.

(Cotton Mather, *Eccl. Hist.* b. iii., and *Life of John Eliot*, Edinb., 1828.)

ELIOTT, GEORGE AUGUSTUS, was born at Stobbs, in Roxburghshire, Scotland, in 1718. He studied at Edinburgh, and afterwards at the University of Leyden. His knowledge of tactics was acquired in the celebrated school at La Fère. Having entered the army, he attained the rank of lieutenant-colonel, accompanied George II. to Germany in 1743 as aid-de-camp, and was wounded in the battle of Dettingen. In the Seven Years' War, he distinguished himself in 1757 under the duke of Cumberland and Prince Ferdinand of Brunswick. In 1775, being then a lieutenant-general, he was appointed to the government of Gibraltar. His memorable defence of that important fortress against the combined efforts of France and Spain was the last exploit of his life. After the peace he was created a peer by the title of Lord Heathfield. His lordship died at Kalkofen, near Aix-la-Chapelle, whither he had gone for the benefit of the waters, July 6, 1790. His portrait, one of Reynolds's best, is in the National Gallery, London.

ELIS or ELEA, a district of the Peloponnesus included between Achaia, Arcadia, Messenia, and the sea. Elis was originally divided into three parts, the northern, called hollow Elis, the southern, Triphylia; and that in the middle, Pisátis. The Eleans were the first people in the Peloponnesus who experienced the effects of the Dorian invasion, as their territory was the landing place of the invaders, and was assigned by them to their ally the Ætolian Oxylus. Oxylus and his new subjects conquered Pisa and Olympia, where the Olympian games were established about 1104 B.C., though they were not regularly celebrated till Corœbus gained the prize in 776 B.C. Those games exercised a most important influence on the subsequent destinies of Elis. In the earlier periods the people of Pisa, which was in the neighbourhood of Olympia, sometimes presided over the celebration of the games; but the wars between Messenia and Sparta enabled the Eleans to form a conection with the Spartans, which ended in a tacit understanding that the intervening sea-coast

should be divided between the two powers; the resistance of the Pisatæ only brought upon them the destruction of their city and the annexation of all Triphylia to Elis. The harmony between Elis and Sparta was interrupted during the Peloponnesian war by the countenance which the Spartans afforded to the Lepreatæ, and the Eleans endeavoured to avenge this interference by excluding the Spartans from the Olympic games. After some years of misunderstanding, they were compelled to return to the Spartan alliance by the invasion of Agis. In 365 B.C. they were engaged in a war with the Arcadians, which deprived them of almost all their southern territories. The Eleans were firm supporters of the Ætolians during the Social War, and never joined the Achæan league.

The city of Elis was originally called Ephyra. The site of the ancient capital is now Paleópoli. 'The ruins consist of several masses of Roman tile and mortar, with many wrought blocks of stone and fragments of sculpture scattered over a space of two or three miles in circumference.' (Leake, i., p. 5.) The soil was sandy, argillaceous, or a rich mould. (Leake, ii., p. 179.) The territory was fertile. Its principal rivers are the Alpheius (Rofea) and the Peneius (Gastuni). The principal sea-port of Elis was Cyllene, the modern Chiarenza.

ELIXIR OF VITRIOL. [SULPHURIC ACID.]

ELIZABETH, queen of England, the daughter of Henry VIII., by his second wife, Anne Boleyn, was born at Greenwich, September 7, 1533. Her right of succession to the crown was the subject of several acts of parliament. Soon after her birth, the 25 Henry VIII., c. 22, settled the crown on her and her heirs in default of male issue by Anne Boleyn; by the 28 Henry VIII., c. 7, both Elizabeth and Mary were bastardized, the marriages whence they proceeded being declared unlawful and void; the 35 Henry VIII., c. 1, however, settled the crown in succession on Edward, Mary, and Elizabeth. Edward, however, passed over both Elizabeth and Mary in the will he made before his death; and Mary, by the Act 1 Mary, st. 2, c. 1, again bastardized Elizabeth, by enacting that the divorce of Catharine of Aragon by Henry was altogether void.

In 1535, an unsuccessful negotiation was entered into for the marriage of Elizabeth to the duke of Angoulême, the third son of Francis I. of France; and another in 1546 with Philip of Spain, son of the Emperor Charles V. Philip was afterwards the husband of her sister Mary. Elizabeth's next suitor was the protector Somerset's unfortunate brother, the Lord Seymour of Sudley, to whom it is said Elizabeth allowed freedoms that gave much uneasiness to Seymour's wife, queen Catharine Parr, and it was part of the charge on which Seymour was attainted and executed, that he had plotted to seize the person of Edward VI. and to force Elizabeth to marry himself.

In 1550, it was proposed that Elizabeth should be married to the eldest son of Christian III. of Denmark; but the negotiation seems to have been stopped by her refusal to consent to the match. At this period of her life Camden has given an interesting account of the situation and employments of Elizabeth. He says, that before she was seventeen years of age she understood well the Latin, French, and Italian tongues, and had an indifferent knowledge of the Greek. Neither did she neglect music, so far as it became a princess, being able to sing sweetly, and play handsomely on the lute. On the accession of Mary, Elizabeth was for a time treated with great favour. At the coronation in October, 1553, Elizabeth and the lady Anne of Cleve followed in a chariot next to that of the queen, and one account says that Elizabeth carried the crown on that occasion. Her position, however, was one of great difficulty. Looked up to as the head of the Protestant party, and offending Mary by refusing to attend mass, she gladly availed herself of the pretext for retiring from court afforded her by Mary assigning her a rank below what her birth entitled her to, after the passing of the act which declared her mother's marriage illegal. She went to Ashridge, in Buckinghamshire, whence she was fetched by a party of horse on February 18, 1554, immediately on the suppression of Wyatt's attempt, in which she was accused of being implicated. She was kept in close confinement at Whitehall for some time, and then committed to the Tower on March 11. She remained in close custody for about a month, after which she was allowed to walk in a small garden within the walls of the fortress. On the 19th of May she was removed, in charge of Sir Henry Bedingfield, to Woodstock. She remained at Woodstock till April, 1555, when she was, on the interposition, as it was made to appear, of King Philip, allowed to take up her residence at the royal palace of Hatfield, under the superintendence of a Catholic gentleman, Sir Thomas Pope, by whom she was treated with respect and kindness.

She continued to reside at Hatfield till the death of Mary, which took place November 17, 1558. Both houses of parliament met, acknowledged her as Mary's successor by acclamation, and, as soon as the houses rose, the proclamation took place. Elizabeth came to London on Wednesday, the 23rd: she was met by all the bishops in a body at Highgate, and escorted by an immense multitude of people of all ranks to the metropolis, where she took up her lodgings at the residence of Lord North, in the Charter House. On the afternoon of Monday the 26th she made a progress through the city in a chariot to the royal palace of the Tower; here she continued till Monday the 5th of December, on the morning of which day she removed by water to Somerset House. Elizabeth's first act was to recall the celebrated Wm. Cecil to the office of secretary of state, which he had already held under Edward VI., and she soon after created Nicholas Bacon (father of the chancellor) keeper of the great seal. Cecil became lord high treasurer in 1572, and with Walsingham was the queen's principal adviser in all state matters till his death in 1598.

The affair to which Elizabeth first applied her attention was the settlement of the national religion. The opinions of Cecil strongly concurred with her own in favour of the reformed doctrines, to which also undoubtedly the great mass of the people was attached; and a succession of acts

were gradually passed, and measures taken, by which this object was effected, though not without considerable opposition, both from the Roman Catholic party and the Puritan, the latter of whom had been gathering strength and numbers even from the commencement of the Reformation. It was against the Roman Catholics however that the most severe measures were taken. By an act passed in 1585 (the 27 Eliz. c. 2) every Jesuit or other popish priest was commanded to depart from the realm within forty days, on pain of death as a traitor, and every person receiving or relieving any such priest was declared guilty of felony. Many priests were afterwards executed under this Act.

It was the struggle with popery that moved and directed nearly the whole policy of the reign, *foreign as well as* domestic. When Elizabeth came to the throne she found the country at peace with Spain, but at war with France, the great continental opponent of Spain and the Empire. Philip, her predecessor's husband, with the view of preserving his English alliance, almost immediately after her accession, offered himself to Elizabeth in marriage; but she declined it. A general peace, however, comprehending all the three powers, and also Scotland, was established in April, 1559, by the treaty of Cateau Cambresis. Scarcely however had this compact been signed when the war was suddenly rekindled, in consequence of the assumption by the new French king, Francis II., of the arms and royal titles of England, in right, as was pretended, of his wife, the young Mary, queen of Scots. Elizabeth instantly resented this act of hostility by sending a body of 5000 troops to Scotland, to act there with the duke of Chatelherault and the lords of the congregation, as the leaders of the Protestant party called themselves, and the French king was speedily compelled both to renounce his wife's pretensions to the English throne and to withdraw his own troops from Scotland, by the treaty of Edinburgh, executed July 7, 1560. Francis died before the end of the year, but Elizabeth continued to assist the Huguenot party with men and money.

The history of Mary Stewart and of the affairs of Scotland during her reign and that of her son must be reserved for a separate article. Philip of Spain had been long alienated from Elizabeth by her proceedings in favour of the Reformed religion, and a series of ill-offices and intrigues had taken place on both sides, though not amounting to an open war. Philip had befriended the rebellions in Ireland, and attempts in England in favour of Mary; Elizabeth had espoused the cause of the people of the Netherlands, whither she had sent the earl of Leicester; and an English fleet had attacked and ravaged the Spanish settlements in the West Indies. At last, in the summer of 1588, the great Spanish fleet, arrogantly styled the Invincible Armada, sailed for the invasion of England, and the greater part of the fleet was dashed to pieces on the coasts which it came to assail. [ARMADA.] From this time hostilities proceeded with more or less activity between the two countries during the remainder of the reign of Elizabeth; and it was rather in opposition to Philip, who supported the league, than for his own sake, that Elizabeth gave assistance to Henry IV. of France. In May, 1598, Henry concluded a peace with Philip, who died in September of the same year. But the war between England and Spain was nevertheless still kept up. In 1601 Philip III. sent a force to Ireland, which landed in that country and took the town of Kinsale; and the following year Elizabeth retaliated by fitting out a naval expedition against her adversary, which captured some rich prizes, and otherwise annoyed the Spaniard. Her forces continued to act in conjunction with those of the Seven Provinces both by sea and land.

Elizabeth died on the 24th of March, 1603, in the seventieth year of her age, and the forty-fifth of her reign. One of the first requests addressed to her by the parliament after she came to the throne was that she would marry; but she persisted in remaining single to the end of her days. Yet she coquetted with many suitors almost to the last. Among those who aspired to her hand were Philip of Spain; Charles, archduke of Austria (a younger son of the Emperor Ferdinand I.); James Hamilton, earl of Arran, the head of the Protestant party in Scotland; Erick XIV., king of Sweden (whom she had refused in the reign of her sister Mary); Adolphus, duke of Holstein (uncle to Ferdinand II. of Denmark); Charles IX. of France; the Duke of Alençon; and Camden mentions some English subjects who had 'golden dreams of marrying their sovereign.' Her first and greatest favourite was Robert Dudley (afterwards earl of Leicester), a younger son of the duke of Northumberland. Leicester continued the royal favourite till his death in 1588, disgracing by his profligacy the honours and grants that were lavished upon him by Elizabeth. Very soon after the death of Leicester the young Robert Devereux, earl of Essex, whose mother Leicester had married, was taken into the same favour that had been so long enjoyed by the deceased nobleman; and his tenure of the royal partiality lasted, with some intermissions, till he destroyed himself by his own hot-headedness and violence. He was executed for a frantic attempt to excite an insurrection against the government in 1601.

Both the personal character of Elizabeth and the character of her government have been estimated very differently by writers of opposite parties. She was undeniably endowed with great good sense, and with a true feeling of what became her place. Many of the least respectable mental peculiarities of her own sex were mixed in her with some of the least attractive among those of the other. Her selfishness and her vanity were both intense; and of the sympathetic affections and finer sensibilities of every kind she was nearly destitute.

Her literary knowledge was certainly very considerable; but of her compositions (a few of which are in verse) none are of much value, nor evidence any very superior ability, with the exception, perhaps, of some of her speeches to the parliament. A list of the pieces attributed to her may be found in Walpole's 'Royal and Noble Authors.'

ELIZABETH PETROWNA, daughter of

Peter the Great and of Catherine I., was born in the year 1709. After the death of her nephew Peter II. in 1730, she declined the crown in favour of her cousin Anna. After the death of Anna in 1740, Iwan, the infant son of the duke of Brunswick and of Ann, niece to the late empress, was proclaimed emperor, but was set aside by a military insurrection in 1741. Elizabeth was proclaimed empress, and Ann and her husband, the duke of Brunswick, and the child Iwan, were put in confinement. Several noblemen were sent into Siberia. Elizabeth took an active part in the war of the Austrian succession, and sent troops to the assistance of Maria Theresa, and she afterwards concurred in the peace of Aix-la-Chapelle in 1748. During the Seven Years' War, Elizabeth took part against Frederick of Prussia, with considerable success, but her illness and death retrieved the fortunes of Frederick. She died in December, 1761, after a reign of twenty years, and was succeeded by the duke of Holstein Gottorp, son of her sister Anna Petrowna, duchess of Holstein: he assumed the title of Peter III.

Elizabeth exerted herself to forward the compilation of a code of laws for the Russian empire, a task begun under Peter the Great, but which was not completed till the reign of Catherine II.

ELIZABETHAN ARCHITECTURE. By this name we distinguish that transition style which prevailed in England from about the middle of the 16th to the end of the first quarter of the 17th century, and was accordingly in its meridian during the long reign of Elizabeth. It was applied exclusively to domestic or at least secular buildings, in which respect it was very differently circumstanced from the gothic style, which was almost as exclusively ecclesiastical in character and purpose. The age of Elizabethan architecture was that of palace-building, and a style developed itself which was eminently palatial in many of its qualities. Historical interest it certainly possesses, nor is it deficient in artistic merit: accordingly it has of late years engaged the attention of architectural draftsmen and designers, and has been made the subject of several graphic publications; and it has also been occasionally adopted in practice with more or less success, especially for internal decoration. In the Elizabethan architecture the orders are usually applied only to parts of a front; for instance, the centre, which is marked out as a lofty frontispiece or portal ornamented with several tiers of columns, and thus not only distinguished from the rest, but in many instances rendered quite distinct from it, all besides being comparatively genuine Tudor, without any intermixture of foreign elements. Even where such is not the case, the Tudor physiognomy manifests itself in windows and bays, which last are almost as peculiar to our English architecture of the period as small circular towers and turrets with conical or spire-like roofs are to that of Flanders and France. Although square-headed, and without tracery of any kind, the windows retain a good deal of the latest gothic or perpendicular character, being divided by mullions and transoms into numerous compartments after the manner of panneling, a mode that freely admits of a window being made of any extent; and not only are single windows sometimes exceedingly spacious, but are put so closely together as to render the whole of a front nearly all window.

The most remarkable characteristic of this style is the gable, a feature singularly diversified. Almost every imaginable combination of curves, both concave and convex, with straight lines and angles, are to be met with in gables. Differently shaped gables often occur in the same building, and produce very great effect of outline, which is further increased by embellished parapets with balls and other ornaments upon them, by small domes or turrets, and by chimney-shafts, all which, mingled together in glorious confusion, often give an air of picturesque magnificence to what are otherwise rather plain and homely structures, and impart animation to what would else be lumpish masses. In like manner porches and balustraded terraces often give character to the lower part of a building, while the upper may be comparatively flat and uninteresting. The style is excellently well adapted for brick and stone, such contrast of colour seeming natural to it, and serving to bring out the several parts more distinctly. There are also many instances of brick alone being employed, the ornamental members being formed of moulded bricks, and, though the effect is comparatively sombre, it is by no means unpleasing.

To the internal characteristics of the Elizabethan style belong spacious bay-windows; long and ample galleries, but generally of low proportions; massive and elaborately sculptured chimney-pieces; screens of similar character, either with open arches or doors; wainscoted and panneled walls; ceilings highly enriched, and sometimes arched, and entirely covered with scroll-work foliage; and wide staircases with richly carved balustrades. The prevailing character is that of heaviness and stateliness; on which account it is ill-suited for literal imitation at the present day, especially for houses upon a moderate scale, or for small rooms.

ELIZABETHGRAD. [KHERSON.]

ELIZONDO. [BAZTAN.]

ELK. [DEER.]

ELL (*Ulna*), a measure of *length*, now almost disused. The three ells which have preserved a place in our arithmetical works, namely the Flemish, English, and French ells, are respectively three, five, and six quarters of a yard.

ELLAGIC ACID exists in the gall-nut along with gallic acid, from which it is separated by boiling water. It is of a light fawn colour, insipid, and slightly soluble in boiling water. When heated in close vessels it decomposes, yielding a yellow vapour, which condenses in crystals of the same colour. It is composed of H^2, C^7, O^4. It forms neutral salts with soda, potash, and ammonia.

ELLEBORIN, a resin, of an extremely acrid taste, found in the *Helleborus hyemalis*. It is a white, soft, inodorous granular mass, which readily melts into an oily fluid.

ELLENBOGEN. [BOHEMIA.]

ELLESMERE. [SHROPSHIRE.]

ELLICHPOOR, a city of Hindustan, included in the territory of the Nizam of Hyderabad, is in 21° 16′ N. lat., 77° 32′ E. long. It is only in part surrounded by a wall, and is not a place of strength. The city and a small surrounding territory are held by a chief, who is under the protection of the British, and only nominally subject to the Nizam. The chief has a handsome palace, in the vicinity of which are good brick houses and bazaars, but the greater part of the city consists of mud houses, and has a very mean appearance.

ELLIPSE (ἔλλειψις). This curve, which is one of the Conic Sections, ranks next in importance to the circle (which is itself an extreme form of the ellipse) and the straight line.

An ellipse is easily drawn with a pencil by means of a string attached to two pins, in the manner described under Elliptic Compasses.

The striking use of this curve lies in its being the nearest representative of a planetary orbit which can be given in a simple manner. If the planets did not attract each other, but were only attracted by the sun, they would describe absolute ellipses. Their mutual actions being small, compared with that which the sun exerts, they consequently move in ellipses *very nearly*.

The reader who is not versed in geometry must remember that though an ellipse be an *oval*, yet an oval is not necessarily an ellipse. A figure may be formed by arcs of circles which shall have the appearance of an ellipse, without possessing any of its properties.

ELLIPSOID. [Surfaces of the Second Degree.]

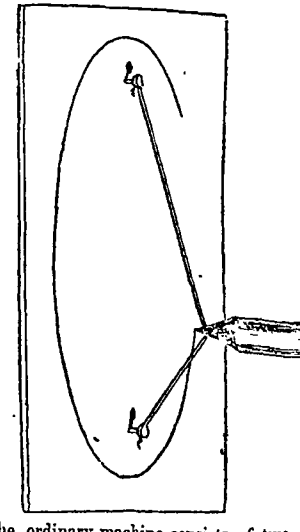
ELLIPSOLI'THES. Mr. Sowerby gave this title to some forms of fossil *Cephalopoda*, from the mountain limestone.

ELLIPSOSTO'MATA, M. de Blainville's name for a family (the third) of his second order, *Asiphonobranchiata*, of his first sub-class, *Paracephalophora Dioica*, of his second class, *Paracephalophora*, of his *Malacozoa*. The *Ellipsostomata* of De Blainville comprehend the genera *Melania*, *Rissoa*, *Phasianella*, *Ampullaria*, *Helicina* (including *Ampulleira*, De Blainv. and *Olygira*, Say), and *Pleurocerus*. Of these all but *Pleurocerus* are included under the Pectinibranchiate Gasteropods of Cuvier.

ELLIPTIC FUNCTIONS, or ELLIPTIC TRANSCENDANTS. The earliest researches into the integrals connected with the arcs of an ellipse or hyperbola are those of Maclaurin, in his treatise on Fluxions, and of D'Alembert, in the 'Berlin Memoirs' for 1746. Fagnani, in 1750, showed how two arcs of an ellipse might be assigned in an infinite number of ways, which should have for their difference an algebraical expression. Euler, in 1761, showed how to assign the complete integral of certain differential equations of which the terms are separately nothing but elliptic functions. Landen, in 1755, showed that every arc of an hyperbola can be obtained by means of two arcs of an ellipse. Lagrange, in 1785, gave a general method for approximating to the values of elliptic functions of all kinds.

But those to whom it is owing that the theory of elliptic functions has become a distinct and important branch of the integral calculus, with general formulæ which bid fair to make it an extended form of trigonometry, are Legendre, Abel, and Jacobi. For references, see Mr. Ellis's excellent Report 'On the Recent Progress of Analysis,' in the yearly volume of the British Association for 1846.

ELLIPTIC COMPASSES, the name given to any machine for describing an ellipse. A simple method of forming the curve is to fasten a pin in the paper at each of the two foci, and to attach to the pins the opposite ends of a thread whose length is equal to the major axis of the ellipse. Then, if a pencil move in such a way as to keep the thread always stretched, it will describe an ellipse.



The ordinary machine consists of two bars of metal at right angles to one another, in each of which is a groove: two pins in a ruler, of which one extremity carries a pencil, are made to travel in the grooves, when the motion of the ruler causes the pencil to describe an ellipse. The distances of the pencil from the two pins are made equal to the semi-axes of the curve.

ELLIPTIC POLARIZATION, in the undulatory theory, is the name given to a supposed rotation of the particles of ether in the peripheries of ellipses when a pencil of plane polarized light is made to suffer reflexions in the interior of glass, or at the surfaces of polished metals.

Let, for example, a pencil of light be polarized in some plane by reflexion from the surface of glass at the proper polarizing angle; and let it be made to enter an oblique parallelopiped or rhomboid of glass perpendicularly to one of its ends, the inclinations of two opposite sides of the rhombojd to the ends being equal to the polarizing angle: the pencil of light will then suffer two reflexions, one from each of two opposite sides of the glass, and it will emerge perpendicularly to the opposite end. Now, if the sides of the rhom-

boid are so disposed that the plane in which the two reflexions take place in it is coincident with or at right angles to the plane in which the pencil of light is polarized, no effect is produced on the pencil; but if the parallelopiped be turned on an axis perpendicular to its two ends till the plane in which the two reflexions take place is inclined to the plane of the original polarization in an angle equal to 45°, 135°, 225°, or 315°, the emergent pencil will be found to be circularly polarized. [CIRCULAR POLARIZATION.] If the inclination of the planes be any other angle than one of these, excluding also the angles 0°, 90°, 180°, 270°, the pencil will be elliptically polarized.

If polarized light, after having suffered two reflexions in the glass parallelopiped, be made to suffer two additional reflexions in a similar parallelopiped, similarly situated, the emergent pencil will be restored to a state of plane polarization; but the new plane of polarization will be perpendicular to the former when the inclination of that plane to the plane of reflexion is 45°, 135°, &c.

Sir David Brewster discovered that, when a pencil of plane polarized light is reflected once from the surface of polished metal, it acquires properties similar to those which arise from two reflexions of the light within glass. First, only a partial polarization takes place in it when the metal is so disposed that the plane of the incident and reflected pencil is coincident with or perpendicular to the plane in which the pencil was originally polarized. Again, if a pencil of light polarized in any plane be reflected from a plate of polished steel so disposed that the plane of the incident and reflected pencils may be inclined 45°, 135°, 225°, or 315° to the plane of original polarization, the angles of incidence and reflexion from the steel being 75°; then that which is called an elliptic polarization takes place. If a second plate of steel be disposed so as to reflect the pencil a second time at an angle of incidence equal to 75°, and the plane in which the two reflexions take place be coincident with or perpendicular to one another, the pencil so reflected will be restored to a state of plane polarization as when it suffered four reflexions in passing through two parallelopipeds of glass.

In circular polarization, if the original plane of polarization make an angle represented by + 45° with the plane of the reflexions, the inclination of the plane of restored polarization always makes an angle represented by − 45° with the same plane of reflexion; but this does not hold good in the elliptic polarization: the angle between the original planes of polarization and reflexion being + 45°, the angles between the same plane of reflexion and that of restored polarization will be as follow: — for silver, − 39° 48′; for gold, − 35°; for brass, − 32°; for copper, − 29°; for mercury, − 26°; for platinum, − 22°; and for steel, − 17°.

It has been proved that, in particular states of the incident pencil, elliptic polarization may take place in an ether whose particles are symmetrically disposed; and that, in an ether whose particles are unsymmetrically distributed, elliptic polarization is a necessary result.

(*General View of the Undulatory Theory*, by Professor Powell, 1841.)

ELLIPTICITY, a term used in the theory of the figure of the earth. It means the fraction which the excess of the axis major over the axis minor of an ellipse is of the axis minor itself. Thus if the axis major be 9 and the axis minor 7, the ellipticity is $\frac{2}{7}$. This term must not be confounded with the *eccentricity*, a word in much more common use.

ELLISTON, ROBERT WILLIAM, was born in London, April 7, 1774. Young Elliston was placed at St. Paul's school, where he distinguished himself by recitations; but when only seventeen he ran away from home, and made his first appearance as an actor at Bath. He continued, with a short interval, during which he returned home, to perform in the provincial theatres till June 1796, when he came out at the Haymarket Theatre as Octavian, in the 'Mountaineers,' and Vapour, in the farce of 'My Grandmother,' on the same evening. He was successful, and afterwards played at Covent Garden and Drury Lane. In 1804 he took on his own account the small house then occupied as the Circus, to which he gave the name of the Surrey Theatre, where he and his company performed some of Shakspere's plays and several operas.

On the reopening of Drury Dane theatre, Elliston delivered Byron's address and performed Hamlet. In 1819 he became the lessee of that theatre, at a rent of 10,200*l.*; and he held this lease till his bankruptcy in 1826. After speculating in the Olympic theatre, he became again manager of the Surrey; and there, till near the close of his life, he continued occasionally to perform. He died of apoplexy on the 7th of July, 1831.

ELLORE. [CIRCARS.]

ELM. [ULMUS.]

ELMSLEY, PETER, was born in the year 1773, and educated at Westminster and Oxford. In 1798 he was presented to the chapelry of Little Horkesley, in Essex. By the death of his uncle, Elmsley, the bookseller, he succeeded to a competent fortune, which enabled him to devote his whole time to literary pursuits. For some time after his uncle's death he resided in Edinburgh, and was one of the earliest contributors to the 'Edinburgh Review.' He was also an early contributor to the 'Quarterly Review:' his paper on Markland's Euripides, in the seventh volume, is well known to scholars. As soon as the state of Europe permitted, Elmsley went abroad, and collated MSS. in the continental libraries. He spent the whole of the winter of 1818 in the Laurentian library at Florence. In 1819 Elmsley was appointed by the government to assist Sir Humphrey Davy in unrolling and deciphering the papyri at Herculaneum; but the attempt was not attended with success.

On his return to Oxford he became Principal of St. Alban's Hall, and Camden Professor of Modern History in that university. He died on the 8th of March, 1825. Elmsley's acknowledged

works were editions of Greek plays. He published the Acharnians of Aristophanes in 1809; the Œdipus Tyrannus of Sophocles in 1811; the Heracleidæ, Medea, and Bacchæ of Euripides in the years 1815, 1818, and 1821; and the Œdipus Coloneus of Sophocles in 1823. His transcript of the Florentine Scholia on Sophocles was published after his death. As a scholar, Elmsley did not pretend to be more than a follower of Porson, but he did far more for Greek scholarship than any English scholar who followed that great critic. He was undoubtedly a man of talent, an excellent Greek scholar, and a sound and honest critic.

ELOCUTION. [ORATORY.]

E'LOGE, in the French language means praise, being derived from the Latin *elógium*, and that from the Greek *eulógia* (εὐλογία). It has become the name of a considerable branch of French literature, which comprehends panegyrical orations in honour of distinguished deceased persons. It is the custom when one of the members of the French or other academies dies, and a new member is appointed in his place, for the new member to deliver a panegyrical oration on the labours and other merits of his predecessor. These éloges are generally printed and published, and although they are mostly written in a florid rhetorical style, still many of them are really interesting biographies. The custom of writing éloges of deceased persons is not confined to members of academies. The Italians have also *Elogii degli Uomini Illustri Toscani*, 3 vols., fol., Firenze, 1766-70, and many other similar compositions.

ELONGATION, an astronomical term for the angular distance between two heavenly bodies as seen from the earth. Custom has confined it to the case in which both bodies are in the solar system, and one of them is generally the sun. Thus we speak of the *distance* of two fixed stars, and of the *elongation* of Mercury from the sun.

ELPHIN, a bishop's see in the ecclesiastical province of Armagh and Tuam in Ireland, is now united with Kilmore and Ardagh, thus forming the bishopric of Kilmore, Elphin, and Ardagh. [BISHOPRIC.]

ELPHINSTONE, WILLIAM, founder of King's College, Aberdeen, was born at Glasgow in 1437. He was educated at the University of Glasgow, where he passed A.M. probably in the 20th year of his age. (Keith's 'Bishops,' p. 116.) Afterwards applying himself to theology, he was made priest of St. Michael's, or Kirkmichael, Glasgow, in which place he served four years, and then proceeded to France, where, after three years' study of the law, he was appointed professor of law, first at Paris and then at Orleans. In 1471 he returned to Scotland, passed through several dignities of the church, was employed in an embassy to France, was made bishop of Ross in 1479, and bishop of Aberdeen in 1484. Elphinstone took a distinguished part in the general affairs of his country. He was successively ambassador to Henry VII., lord chancellor, and lord privy seal, which last office he occupied at the time of his death, Oct. 25, 1514, while negotiations were pending with the court of Rome for his elevation to the primacy of St. Andrews.

Besides a book of canons, extracted out of the ancient canons, Elphinstone wrote a history of Scotland, chiefly out of Fordun. He wrote also some lives of Scotch saints; and in the college of Aberdeen are preserved several large folio volumes of his compilations on the canon law. It was moreover at his solicitation that the convent of Grey Friars at Stirling and the Chapel Royal were founded in 1494, the same year in which he also obtained a papal bull for the erection of a university at Aberdeen.

ELSHEIMER, or ELZHEIMER, ADAM, was born at Frankfort in 1574, and, according to the most probable account, died in 1620. Elsheimer studied in his own country, and at Rome, but he adopted a style of painting peculiar to himself; this was the designing of landscapes with historical figures on a small scale, which he finished in so exquisite a manner, that he was not only far superior to all his contemporaries, but is probably unrivalled in his own line by any artist of subsequent times. Even during his lifetime his pictures bore a very high price, which was considerably increased after his death. He had a large family; and though he received very high prices for his works, he spent so much time and labour upon them, that he could not subsist by what he earned. He was cast into prison for debt; and though soon released, the disgrace preyed on his spirits, and he sunk under his misfortunes.

ELSINORE (*Helsingoer*), a seaport town in the Danish island of Seeland, stands at the narrowest part of the Sound, 25 miles N. from Copenhagen, in 56° 2′ N. lat., 12° 37′ E. long., and has about 7000 inhabitants. On a tongue of land N.E. of the town, is the fortress of Kronborg, which commands the entrance to the Sound, and there is a handsome palace, called Marienlyst, with an hospital for seamen, built on an eminence close to it. Elsinore itself is an open town, and has been much improved of late years. It has a harbour which is formed by a wooden pier, and is accessible to ships of small draught; a quarantine establishment; some manufactures of arms, sugar, brandy, &c.; and a good foreign trade. The townsmen are also engaged in the fisheries.

Ships passing the Sound pay duties to the Danish government at Elsinore. The number of vessels which passed the Sound during the first 9 months of 1847 was 17,404, which was an increase of 2843 for the same period of 1846; of this number 9100 came from the North Sea, and 8304 from the Baltic.

(*Paris Moniteur*, Oct. 29, 1847; Murray's *Handbook for N. Europe.*)

ELSTER. [ELBE.]

ELSTOB, WILLIAM, descended from an ancient family in the bishopric of Durham, was born at Newcastle-upon-Tyne, January 1, 1673. He received his earliest education in his native town, but was afterwards sent to Eton, and thence successively to Catherine Hall, Cambridge, and to Queen's College, Oxford, whence, in 1696, he was chosen fellow of University College. In 1701 he translated the Saxon Homily of Lupus into Latin, with notes, for Dr. Hickes. In 1702 he was pre-

sented by the dean and chapter of Canterbury to the rectory of the united parishes of St. Swithin and St. Mary Bothaw, in London, where he continued till his death. In 1703 he published, at Oxford, an edition of Roger Ascham's Letters; and in 1709, in the Saxon language, with a Latin translation, the Homily on St. Gregory's day. He died March 3, 1714-15. (Pegge's *Hist. Account of the Textus Roffensis;* and of Mr. Elstob and his sister, in the *Bibl. Topogr. Britan.*, No. xxv.; Kippis's *Biogr. Brit.*)

ELSTOB, ELIZABETH, sister of William Elstob, was born at Newcastle, September 29th, 1683. During her brother's continuance at Oxford she resided chiefly in that city with him, and afterwards removed with him to London, where she joined him in his Saxon studies. When her brother printed the Homily upon St. Gregory's day, she accompanied it by an English translation and a Preface. By the encouragement of Dr. Hickes, she undertook a Saxon Homiliarium with an English translation, notes, and various readings, of which a few sheets only were printed at Oxford, in folio, when the work was abandoned. Her transcript of the Saxon Homilies in preparation for this work is preserved in the Lansdowne Collection of MSS. in the British Museum. In 1715 she published a Saxon grammar, in 4to., the types for which were cut at the expense of Lord Chief Justice Parker, afterwards earl of Macclesfield. After her brother's death, Mrs. Elstob retired to Evesham in Worcestershire, where she subsisted with difficulty by keeping a small school. She was subsequently patronized by Queen Caroline, who granted her a pension of 20*l.* a year; but this bounty died with the queen. In 1739 the duchess dowager of Portland took Mrs. Elstob into her family as governess to her children, where she continued till her death, May 30, 1756. (Nichols's *Literary Anecdotes.*)

ELTHAM. [KENT.]

ELUTRIATION, the process of separating substances reduced to powder, when of different specific gravities, by means of water. It is also employed as a method of reducing any one substance to a fine powder.

ELVAS, a town in the province of Alentejo in Portugal, about 125 miles E. from Lisbon, is situated on a hill in the midst of an extensive plain. It is a frontier town, and about 12 miles W. of Badajoz. Elvas is the strongest fortress in Portugal: the town is situated between two castles, Santa Lucia and La Lippe, which stand on two summits commanding the town. It is a bishop's see, and the chief town of the comarca of Elvas. The town contains about 13,000 inhabitants, and has a fine cathedral, and very extensive barracks, which are bomb-proof. A handsome aqueduct brings water to the town from a distance of about 4 miles. (Miñano, *Diccionario Geografico.*)

ELY, a city and the see of a bishop, in Cambridgeshire, is situated on an eminence, near the western bank of the Ouse, which is navigable for barges from Lynn, at the mouth of the river, to Ely. The city is 15 miles N. by E. from Cambridge, and 72 miles N. by E. from London, by the London, Cambridge, Ely, &c., Railroad. The city consists chiefly of one long street, and has a spacious market-place near the centre. Ely was in very early Saxon times the site of a monastery, which having been destroyed by the Danes, was rebuilt, and in 1109 was erected into a bishopric by Henry I., when the manors belonging to the monastery were divided between the bishop and the monks, who were thenceforward governed by a prior. Henry VIII. by charter converted the conventual church into a cathedral. The most ancient parts of this fine structure were erected in the reigns of William Rufus and Henry I., and the whole was completed about 1340. The length of the cathedral is 517 feet; of the transept, 190 feet. The height of the great western tower is 270 feet. The central octagon tower is surmounted by a dome, over which is a lantern 170 feet high. The interior is very beautiful. Ely Cathedral is now (1848) in process of reparation. The bishop's palace is near the west end of the cathedral. There are two parish churches, one of which is the chapel of St. Mary, attached to the north side of the cathedral. The shire-hall is a handsome building of free-stone erected in 1821, and there is a gaol and a house of correction adjoining. A free grammar school, founded by Henry VIII., is under the control of the dean and chapter. The population of the city of Ely in 1841 was 6826. Coarse pottery is the only manufacture of consequence. The bishopric of Ely comprises Cambridgeshire, Bedfordshire, Huntingdonshire, and part of Suffolk.

ELYMA'IS, the name of a district of Persia, between Susis and Media, and of a city, its capital, situated on the river Eulæus. According to Strabo (p. 744), the population consisted of husbandmen, who cultivated the plains, and a numerous army, principally archers, who occupied the high lands. The king of Elymais was so powerful in the time of Strabo that he could assert his independence in spite of the Parthians, though it appears from the same writer that the Parthians on one occasion invaded Elymais, and carried off a spoil of 10,000 talents from the Elymæan temple of Artemis at Azara. Antiochus Epiphanes had previously made an unsuccessful attempt to rob the same wealthy temple. (Joseph. *Antiq.* xii. c. 13; Justin. lib. xxxii., and *Maccabees* i. vi. 1.)

E'LYMUS, a genus of grasses belonging to the tribe *Hordeineæ*. Two species only are natives of Great Britain. *E. arenarius* is a coarse grass, common on sandy sea-shores; and, with other grasses, it sends down long fibrous roots amongst the sand in such a way as to prevent its moving about with the winds. *E. geniculatus*, Pendulous Lyme Grass, has been found near Gravesend, and is described by Mr. Babington.

ELY'SIUM, the name given by the ancient Greeks and Romans to the abode of the righteous after death.

ELZEVIRS, the name of a family of printers and publishers at Amsterdam, Leyden, the Hague, and Utrecht. The right name of the family was Elzevier. They are believed to have come originally either from Liege or Louvain. In neatness and in the elegance of small type they ex-

ceeded even the family of the Stephens. Their Virgil, their Terence, and their Greek Testament are considered the master-pieces of their productions; but the Virgil is said to be incorrect.

The first trace of the name of Elzevir is found in an edition of Eutropius, printed in 1592, published at Leyden by Louis Elzevir, who was still living there in 1617. Matthew, his eldest son, died at Leyden in 1640. Giles, his second son, was a bookseller at the Hague in 1599. Isaac, the eldest son of Matthew, was the first printer of his family, and printed from 1617 to 1628. Abraham and Bonaventure, the third and fourth sons of Matthew, were printers and booksellers. Bonaventure was a partner with his father in 1618, and occurs associated with his brother Abraham in 1626. The set of Elzevirs which the French call 'Les Petites Républiques,' the Accounts of the Nations of the World, were published by Abraham and Bonaventure. Their brother Jacob printed at the Hague in 1626. Both Abraham and Bonaventure died at Leyden in 1652. Louis, the second of the name, the son of Isaac, was established as a printer at Amsterdam from 1640 to his death in 1662. Peter, son of Arnout, the second son of Matthew Elzevir, printed at Utrecht in 1669, and was living in 1680. John and Daniel were sons of Abraham, and printed in partnership in 1652: but John printed alone in 1655, when Daniel appears to have been associated with his cousin Louis. John died in 1661; Daniel in 1680. Daniel left children who carried on the business.

The Elzevirs printed several catalogues of their editions; but the best are contained in the 'Notice de la Collection d'Auteurs Latins, Français, et Italiens, imprimée de format petit en 12mo., par les Elzevirs;' in Brunet's 'Manuel du Libraire,' 3rd edition, 8vo., Paris, 1820, vol. iv. p. 533-567; and in 'Essai Bibliographique sur les Editions des Elzevirs, précédé d'une Notice sur ces Imprimeurs Célèbres,' 8vo., Paris, Didot, 1822.

EMBALMING. [MUMMY.]

EMBANKMENT. It is often necessary to raise mounds or dykes along the course of rivers to keep them within their channels, and prevent their flooding the lands which lie near them. Many parts of Holland could not be inhabited if the sea were not kept out by strong embankments; and the destruction of a dyke frequently desolates great tracts of country.

The first thing to be attended to in forming embankments is to enable them to resist the pressure of the highest floods which are likely to occur, and to prevent the effect of the waves and currents in washing them away. When it is the simple pressure of a column of water which is to be withstood, a simple earthen bank made of the soil immediately at hand, provided it be not of a porous nature, is sufficient. Its form should be a very broad base with sloping sides and with a flat top, which may serve as a path or even a carriage-road.

When the dykes are only intended to check the waters at the time when they flow over their natural banks, it is best to raise them at some distance from the river on each side and parallel to its course; because, in sudden floods, the water, having a greater space to flow through, will not rise so high, and will sooner recede.

Where embankments are made against the sea, greater skill is required to resist the force of the waves. If there are materials at hand to lay a bank of stones imbedded in clay, with a broad base, and the sides sloping very gradually upwards, a very safe barrier may be opposed to the waters. It is not the direct impulse which is the most destructive; waves striking against a sloping surface lose their force and rise over it; but it is in returning that they draw the materials with them, and scoop out the foundations. In a place where shingles were usually thrown up by the waves, and the bottom was a strong clay, their retreat has been intercepted by rows of strong piles driven in a line along and parallel to the shore, and covered with boards nailed to them on the land side. In one night the shingles have been thrown over the piles; and being retained by the boarding, have formed a perfect wall. In other cases several rows of piles are driven in, and stones thrown into the spaces between them.

Where the land lies very flat for a considerable distance from the shore, it is of advantage to have two complete banks, one within the other; so that if the outer bank is broken through, the second will keep back the waters, until the first can be repaired. The water which accumulates within the banks, and is collected in the internal ditch and those which divide the marshes, must be let off occasionally by means of channels and sluices at the time when the tide is out, and the water outside the bank is lower than that which is within it.

EMBARGO, the word used to denote the act by which any government lays an arrest on ships to prevent their leaving its ports. On the breaking out of war with any nation it has been usual for the government of each country to lay an embargo upon such of the enemy's ships as are within reach, with a view to their being declared good and lawful prize. During the progress of war, when any expedition is on foot against the enemy, and it is desirable to keep the circumstance from the knowledge of the party to be attacked, it is usual to lay an embargo upon all private vessels, as well those under the national flag as foreign vessels, until the object to be attained by secrecy is accomplished. An embargo may also be laid by the government upon ships belonging to its subjects, with a view to their employment for the service and defence of the nation. In all these cases it is clear that embargoes are detrimental to commerce. The only case in which they have an opposite character is when a foreign vessel of war or privateer frequents a neutral port, and is restrained from quitting the same until a certain time shall have elapsed after the departure from the port of any vessel of which it might otherwise make prize.

EMBER-DAYS and WEEKS, certain seasons of the year set apart for imploring the blessing of the Almighty on the produce of the earth by prayer and fasting, observed in the Christian

church as early as the third century. At first the Ember-Days were not uniformly observed by different churches at the same time; but the Council of Placentia, A.D. 1095, fixed the spring and summer Ember-Days to be the Wednesdays, Fridays, and Saturdays after the first Sunday in Lent and Whitsunday; those of autumn and winter upon the same days after the feast of the Holy Cross (September 14th) and St. Lucia (December 13th).

EMBERIZIDÆ, the Latin name for the birds popularly known in England by the name of Buntings. [FRINGILLIDÆ.]

EMBEZZLEMENT, from the old French word *besler* or *embesler*, to filch, is the fradulent appropriation by servants and others of money or goods entrusted to their care, or received by them on account of their employers. Embezzlement by clerks or servants is an indictable offence under the 7th and 8th Geo. IV., cap. 29, sect. 46. Embezzlement by agents, bankers, attorneys, &c., is constituted a misdemeanour by the same statute, sect. 49. The 2nd Wm. IV., cap. 4, sect. 1, contains the law as to embezzlement by public servants.

As to bankrupts and insolvents, see BANKRUPT and INSOLVENT.

EMBLEMENTS, from the French words *emblavence de bled* (corn sprung or put above ground), means the profits of land sown, but in its usual sense it extends to roots planted and other annual artificial profits which arise from the soil, as, for example, standing corn, hemp, saffron, flax, hops, and garden produce growing above ground, as melons and cucumbers, all of which annually require either sowing, planting, or manuring at the expense of the tenant, and are not a permanent or natural product of the soil.

All persons are entitled to the emblements of land sown by themselves in which they have an uncertain interest. Thus the representatives of a tenant for life, who dies previous to harvest, are entitled to the growing crops.

The parochial clergy, and their under-tenants being also tenants for lives, and their representatives, are entitled to emblements by the 28th Henry VIII., c. 11, sect. 6. The produce of fruit-trees and grass is not included within the meaning of emblements. The executors of a tenant in fee, or in tail, are also entitled to the emblements as against the heir or heir in tail, but not as against a doweress or a devisee of tenant in fee, for the devise of the land carries with it the crops.

EMBLICA, a genus of plants belonging to the natural order *Euphorbiaceæ*. *E. officinalis* is a native of most parts of India. The bark of this tree is astringent, and is used in India as a remedy for diarrhœa. The fruit is acid and astringent, and when eaten acts as a mild purgative.

EMBOSSING is the art of producing raised figures upon wood or other materials, by means of pressure, either applied by a sudden blow, as in a stamping-press, or in a more gradual manner, as by an ordinary screw or hydraulic press, or by revolving cylinders. The pattern is usually produced by forcing the face of the material against an engraved die in which the design is cut; and sometimes, when the article to be embossed is in the form of a thin sheet, a counterpart to the die is applied at the back to aid the process. In many cases heat is employed during the operation with great effect.

Mr. Straker has proposed a method of embossing, by pressing a device forcibly on a surface of wood, planing down the rest of the surface, and bringing up again into relief the pressed portion, by exposing it to the action of water. Leather is capable of being embossed in a beautiful manner, by being pressed into metallic moulds while in a very moist, soft, and pliable state.

EMBRACERY, an attempt to influence or corrupt a jury, or induce them to favour one of the parties in a cause. It is punished by fine and imprisonment. The crime of embracery is completed whether the jury on whom the attempt is made give any verdict or not, or whether the verdict given be true or false.

EMBRASURE (in Architecture) is the indent of a battlement. [BATTLEMENT.] It signifies also the splay of a door or window. The term is derived from the French.

EMBRASURE (in Fortification) is an opening made in an epaulement or parapet for the purpose of allowing a gun to be fired through it. Embrasures are usually two feet wide at the neck, or interior extremity; and at the mouth, or exterior extremity, their width is equal to half the thickness of the epaulement, that is, about nine feet. The cheeks or sides are frequently formed vertically at the neck, that the men who serve the guns may be covered as much as possible; but beyond that part each side declines gradually from a vertical plane, outwards, in order that it may be less injured by the fire of the piece.

In permanent fortifications the sides of the embrasures are generally reveted or lined with brickwork; but in field-batteries the earth at the sides is either without support, or is kept up, about the neck, only by gabions or fascines.

EMBROCATION, a term employed to denote certain external applications, which produce the effect of counter-irritants, and are applied by rubbing.

EMBROIDERY, a mode of working devices on woven substances. In some examples of this kind a rich effect is produced by inserting slips of parchment cut to suit the devices, between the fabric upon which the embroidery is executed and the threads of silk or other material of which the pattern is formed, so that the embroidery may be raised considerably above the surface. Gold and silver thread are often used in embroidery with good effect, and spangles or tinsel are occasionally mixed with the needlework. The fabric to be embroidered is usually stretched in a kind of frame or loom, and the pattern is drawn either upon its surface, or upon a piece of paper applied underneath it.

Although embroidery has, until within a few years, been a purely handicraft employment, it has latterly assumed the character of a manufacture, a most ingenious machine for executing it having been invented by M. Heilmann of Mühlhausen, and brought into use in France, Germany, Switzerland, and England. Attend-

ed by one grown person and two children, each machine does as much work as fifteen embroiderers. The machine is figured and minutely described in Ure's 'Dictionary of Arts.' The embroidery of the middle ages is noticed under TAPESTRY.

EMBRUN. [ALPES, HAUTES.]

EMBRYO. [FŒTUS.]

E'MBRYO (ἔμβρυον, properly the young of an animal while still in the mother). In Botany the Embryo is that part of the seed in plants which in the course of its development becomes the young plant. In the early stages of the growth of the seed, a projection is formed from the side of the ovarium; this mass, which is composed of cellular tissues, is called the nucleus; as it develops itself, a distinct cavity is observed in its interior, which is called the sac of the embryo. After the contact of the pollen with the stigma, this sac disappears, and an embryo is found in its place. The principal points to which attention has been recently directed are, first, the determining cause of the growth of the embryo, and, second, the mode of its development. With regard to the first point, it is now well ascertained that the pollen, by means of its tubes, passes from the stamen to the pistil, and at last coming in contact with the ovule, produces the growth of the embryo. But the question still arises as to whether the pollen-tube becomes the embryo, or a portion of matter formed under its influence in the embryo sac. Schleiden, who must be ranked amongst the greatest physiological observers of the present day, says that if the pollen-tubes be followed into the ovule, it will be found that usually one, and rarely more, penetrates the intercellular passages of the nucleus and reaches the embryo-sac, which being forced forward, is pressed and indented, and by its folding-in forms the embryo in the first stage of its development. A bag is thus formed consisting of a double membrane, the indented embryo-sac and the membrane, and the membrane of the pollen-tube itself.

These views of Schleiden, with his conclusion that the pollen-tube should be regarded rather as the representative of the female than of the male in the animal kingdom, have been adopted by Professor Wydler of Berne, who did not however observe the folding-in of the embryo-sac described by Schleiden.

On the other hand, observations have been made in France, by MM. Mirbel and Spach, on another class of plants, in which they did not meet with the structure described by Schleiden, and consequently they object to the general application of his conclusions. They examined the development of the ovule of the *Zea Mays* (common maize). In this plant there is no true embryo-sac, but they found the commencement of the embryo, which they call the primary utricle, and which Schleiden described as the result of an involution of the sac, existing in the cavity of the nucleus. In this plant also, only one, and not two membranes, as described by Schleiden, existed in the embryo. They also found in other plants the primary utricle existing in the interior of the embryo-sac, and at a period anterior to the act of impregnation. They therefore conclude that the pollen-tube does not become the embryo, and that no involution of the embryo-sac takes place. Their conclusions are probably as much too general as those of Schleiden.

Mr. Griffiths, in a paper recently published in the Linnean Transactions, gives the result of a long series of investigations on the development of the ovulum in the genera *Santalum*, *Osyris*, *Loranthus*, and *Viscum*. From his observations on these plants, which differ from those investigated by Schleiden, and Mirbel and Spach, he has arrived at conclusions somewhat different from those of any of these observers, and he carefully refrains from drawing an inference from the facts which he has observed that would apply to the whole vegetable kingdom. He also expresses his conviction that the primordial or primary utricle of MM. Mirbel and Spach is the sac of the embryo, which no doubt often and perhaps generally exists before fecundation.

Dr. Giraud states from his observations on the *Tropæolum majus*, 'that in this plant the primary utricle and the future embryo never have any structural connection with the extremity of the pollen-tube at their first origin, or at any subsequent period of their development, as is sufficiently obvious from the fact that the pollen-tube is never brought into contact with the embryo sac. As the primary utricle makes its appearance before impregnation has occurred, it cannot be possible that the organ has ever formed the extremity of the pollen-tube, as is believed by Schleiden and Wydler. The views of Schleiden have also been opposed by Mohl, Nageli, Müller, and others.

EMDEN, a town in the Hanoverian province of Aurich, stands on the eastern shore of Dollart Bay, near the mouth of the Ems, to which it is joined by the Delf Canal, in 53° 22′ N. lat., 7° 12′ E. long., and has 12,300 inhabitants. It is surrounded with walls and towers, and consists of Faldern, the old town, and two suburbs. It has all the appearance of a Dutch town, and is intersected by canals, over which there are thirty bridges. Its spacious town-hall, with an old armoury and library, is a noble building. There are six churches, a synagogue, a gymnasium, schools of navigation and design, an orphan asylum, a castle, and custom-house, in the town.

Emden is the principal seaport of Hanover; the trade is chiefly in Hanoverian and Dutch vessels. It has been a free port ever since the year 1751; but the Delf Canal, which unites the harbour with the town, can be entered at high water only; and even then it is not navigable by vessels of more than 13 or 14 feet draught. All ships of greater draught are obliged to discharge their cargoes in the fine roadstead called Delf, into which the canal opens. There is a treckschuyt, or towing canal, about 14 miles in length, between Emden and Aurich. Ship building is carried on to a considerable extent; the herring fishery, which is a source of great profit, is carried on by four companies, who send out between fifty and sixty ships. Emden has brandy distilleries, sawing and oil-crushing mills, manufactures of fustian, cottons, stockings, sail-cloth, cordage, needles, leather, soap, tobacco, &c. It has con-

siderable trade in linens, thread, grain, butter, and cheese.

EMERALD. [BERYL.]

EMERSION (Astronomy), the reappearance of one heavenly body from behind another after an eclipse or occulation.

EMERSON, WILLIAM, a mathematician, was born at Hurworth, a village about three miles from Darlington, in June 1701; he died May 20th, 1782, at his native place, aged nearly 81 years.

His father, Dudley Emerson, was a schoolmaster and a mathematician, and his instruction and library aided the son, who was also assisted in classics by a young clergyman.

After the death of his father, Emerson attempted to continue the school, which however he soon relinquished; he had a small competence left him by his father. He devoted his long life to writing a series of mathematical works. He also contributed largely to the different mathematical periodicals of his time, though almost always under some fanciful name, as Merones, Philofluentimecanalgegeomastrolongo, &c.

Mr. Emerson was in person rather short, but strong and well-formed, with an open honest countenance and ruddy complexion. A portrait of him, by Sykes, was painted and engraved in the latter part of his life; but it is not often to be met with, as only a few copies of it were circulated. His health was generally excellent till near the latter part of his life, when he became a great sufferer from the stone.

Emerson was married, but had no children. He amused himself with fishing, a diversion to which he was much attached, and would frequently stand up to his middle in the water for hours together when he found it gave him a better position for the use of his fly or his angle. He was an excellent practical mechanic, and of most of the machines described in his work on mechanics he had made very good models. The spinning-wheel delineated in that work was the one on which his wife employed her leisure hours. He had also a very profound knowledge of the musical scales, both ancient and modern, although he was but a poor performer: still he was dexterous in the repair of musical instruments, and was generally employed to tune the harpsichords and clean the clocks throughout the district in which he resided.

Emerson was an eccentric man, who never lived in the busy world. There is an amusing life of him at the beginning of his works which were collected (this is the proper word, for they were not reprinted) in eleven volumes. They run through all the branches of mathematics, and were much esteemed in their day.

EMERY. [CORUNDUM.]

E'META, a vegetable alkali obtained from ipecacuanha root, in which the powers of that medicine reside. It is white, pulverulent, and uncrystallizable; its taste is rather bitter, and it melts at 104° Fahr. In the dose of half a grain it acts as a powerful emetic, and in larger doses its effects are extremely violent.

EMETICS (ἐμετικὰ, *emética*) are substances which influence the stomach in a peculiar manner, so as to invert its action and cause vomiting; and this effect is produced without reference to the quantity of matter introduced into that organ or into the circulation. The action of emetics must be viewed in two stages, the primary and secondary. The primary effects of emetics are limited to the emptying of the stomach, compressing, during the act of vomiting, the gall-bladder and pancreas, and exciting to contraction the muscular parietes of the abdomen and thorax, as the machinery by which the process of vomiting is chiefly accomplished.

Soon after a quantity of an emetic substance or solution (such as ipecacuanha or emetic tartar) has been received into the stomach, a feeling of anxiety is experienced in the epigastrium, a general uneasiness termed nausea is felt, which progressively becomes greater, till it ends in the forcible expulsion of the contents of the stomach. In the preliminary stage, the countenance is pale and collapsed; the pulse is small, contracted, irregular, but quick more generally than slow; chilliness is felt, and a cold perspiration may ooze from the surface, all which symptoms disappear when the expulsive movement takes place.

When emetics are given in a smaller quantity, and repeated at intervals, they merely create a state of nausea, during which the appetite is lowered, and arterial action is much diminished, while the function of absorption is roused to great activity. The secondary effects of emetics depend upon the succussion of the frame, the equalization of the circulation, the increased secretion from the mucous membrane of the stomach, and also of the duodenum as well as the liver and pancreas, and frequently from the skin. The secondary effects of nauseating doses are diminished arterial action and augmented absorption.

Emetics are recommended in fever; they invariably render the disease milder, owing to the greater freedom of the secretions which follows their use; and they may be advantageously repeated even in the more advanced stage, frequently inducing sleep and a moist state of the skin. They may be employed in epidemic, typhus, and common fever, and exanthematous fevers, especially measles, scarlet fever, and small-pox. For the slight febrile affections of children, generally caused by something offending the stomach, nothing is so well suited or so efficacious as a gentle emetic. In bilious fevers emetics are required, especially at the beginning. In intermittent fevers, if given before the paroxysm, they early bring on the sweating stage, thus concentrating the fit into a short period. Their tendency to produce perspiration often renders them useful in rheumatic fevers. In common inflammation of the throat, and still more so in croup, emetics are of decided utility. In common catarrh they frequently shorten the disease; and in the suffocative catarrh and catarrh of old age, emetics mechanically unload the lungs, and render the respiration freer. Few agents are more useful in hooping-cough than emetics. They are very improper where there is a disposition to apoplexy, or tendency of blood to the head, or where the patient is liable to hæmorrhage from

any organ, or is subject to hernia. They are also to be avoided during pregnancy.

EMIGRATION may be defined to be a man's leaving his native country with all his property to settle permanently in another. Emigration is therefore necessarily implied in the word Colonization, and it is by the terms of our definition easily distinguished from a man's temporary absence from his native country, and from the kind of absence specially called Absenteeism. By the term emigrant we generally understand one who leaves an old and thickly peopled country to settle in a country where there is abundance of land that has never been cultivated before, and where the native population is thinly scattered, and the foreign settlers are yet either few compared with the surface or none at all. The countries to which emigration is mainly directed at present are the British possessions in North America, the United States of North America, the great island of Australia, Van Diemen's Land, New Zealand, the Cape of Good Hope, Ceylon, and a few other places.

It was long a prevalent notion that emigration should be discouraged or prevented, as tending to weaken a nation. The abstraction of capital, skill, and industry might seem, and indeed is primarily, so much good taken from the mother country; but inasmuch as the emigrants retain in their new settlements, through the medium of commercial exchange, which is daily becoming more rapid and easy, a connexion with the parent state, it may be and often is the fact, that they ultimately contribute more to the wealth of the mother country when in the new settlements than they could have done at home.

If a state should be wise enough not to discourage emigration, it may be asked, should it aid and direct it? So far as a state should aid and direct emigration, there must be two distinct objects kept in view by the state; one must be to benefit the parent country, the other to benefit those who emigrate. Any system of emigration conducted by government, or by societies, or by the inhabitants of particular districts, would fail in its primary object, relief to the emigrants, unless a corresponding amount of capital should be taken out of the country by other emigrants who might settle in the same place to which the emigrant labourers were sent. To effect such an adjustment between capital and labour, not only should both these elements of wealth in due proportion be transported to the new country, but such proportion should, for some time at least, be maintained by the body which superintends such system of emigration. As no persons can ever succeed as emigrants who are not sober, intelligent, and industrious, and as such alone are consequently fit people to go to a new country, such alone should be sent out by a state or a society, if it interferes in the matter of emigration.

Any plan which shall have for its object the amelioration of a population sunk in ignorance or debased by pauperism, must be one of an internal character, one which must gradually and on certain fixed principles aim at removing the evils which exist in the social system. Emigration

must be left to the free choice of individuals, and must be recommended to the young, the sober, and industrious, solely on the grounds of offering to them a reasonable prospect of bettering their condition in a new country.

Considerations like these led to the formation of a scheme of emigration which was first brought into operation in the colony of South Australia. 'The distinguishing and cardinal principles of the colony of South Australia are, that all public lands shall be sold, and that the proceeds of the sale shall be employed in conveying labourers to the colony.' Further: 'It is essential to the prosperity of a new colony in which there are neither slaves nor convicts, that there should be a constant supply of free labourers willing to be employed for wages. No productive industry worthy of the name can be undertaken unless several hands can be put on the same work at the same time; and if there be not, in a colony in which the compulsory services of slaves or convicts cannot be obtained, a constant supply of labour for hire, no extensive farm can be cultivated, no large and continuous work can be carried on, and the capital imported must perish for want of hands to render it reproductive.' ('First Annual Report of South Australian Commissioners,' 1836.)

It was therefore the object of the commissioners to prevent the labourers, for some time after their arrival in the colony, from purchasing land. This was done by fixing the price of land sufficiently high to prevent the labourer from being tempted too soon to exchange that condition which is for the time most profitable both to himself and the body of emigrants for the apparently higher character of a landowner.

The mode in which unoccupied land is disposed of in the colonies has, it will be seen, a most important influence on the condition and welfare of immigrants. By the application of a general principle of law, the waste lands in the British colonies were considered to be vested in the Crown, and that every private title must rest upon a royal grant as its basis. But since 1831 another principle has been acknowledged and observed: that the Crown holds the lands in question for the purposes of the public good, not merely for the existing colonists, but for the people of the British empire collectively. It must be appropriated to public uses and for the public benefit. The Land Sale Act for the Australian Colonies (5 & 6 Vict. c. 36) prohibits land being alienated by her Majesty, or by any one acting under her authority, except by sale, and in the manner directed by the act.

Down to the year 1831 no regular or uniform system of selling land appears to have been adopted in the British colonies. In place of such system, conditions were attached to the occupation of land under the name of quit-rents, money payments, or the cultivation of the soil; but these conditions were not effectually enforced, and in fact it was generally found impossible to enforce them. Land was profusely granted to individuals in large tracts, and as cultivation was not enforced, and no roads were made through these

tracts, they interrupted the course of improvement. Under the old system, lands in the colony of the Cape of Good Hope, amounting to upwards of thirty-one million acres, have been disposed of for less than 46,000*l.* In Prince Edward's Island the whole of the land was granted in one day to absentee proprietors upon terms which have never been fulfilled. The influence of these proprietors with the Home Government prevented such measures being adopted as were calculated to enforce the settlement of the grants, and consequently the greater part of them remained chiefly in a wild state. ('Report of Mr. C. Buller, M.P., to the Earl of Durham, on Public Lands in British North America,' 1838.) This Report contains an account of the system of granting lands in each of the provinces of British North America; and in all of them it appears to have been injurious to the public interests.

In January, 1840, commissioners were appointed under the royal sign manual to act as a Land and Emigration Board. The sale of the waste lands of the Crown throughout the British colonies is regulated by the commissioners, and they apply the proceeds of such sales towards the removal thither of emigrants from this country, when the land-fund is appropriated to this object. This board is a subordinate department of the Colonial Office.

Summary of Modes of Sale, and Prices, in the principal Land-Selling Colonies.

Colony.	Mode of Sale.	Price per Acre.
North American Colonies:—		
Canada (West)	Fixed Price	8*s.* currency.
Canada (East)	Ditto	6*s.* and 4*s.* ditto, according to situation.
Nova Scotia	Ditto	1*s.* 9*d.* sterling.
New Brunswick	Auction	3*s.* currency upset price.
Prince Edward's Island	Ditto	10*s.* to 20*s.* ditto.
Australian Colonies:—	By Auction.	
Sydney	Country Lands not sold at the public sales may be afterwards bought at the upset price as a fixed price.	Lowest upset price, 1*l.* sterling.
Port Phillip		
Western Australia		
South Australia		
New Zealand		
Falklands	Auction. Ditto Ditto	Lowest upset price, 8*s.* sterling.
Bahamas	Auction. Ditto Ditto	Ditto 6*s.*
Other West India Colonies	Auction	Ditto 1*l.*
Cape of Good Hope	Lowest upset price, 2*s.* sterl. Ditto	Ditto 1*l.* sterling.
Ceylon	Ditto	Rent to be ascertained by Auction.
Hong Kong	Ditto. Only leases granted.	

The commissioners are enabled to grant free passages to those colonies only which provide the necessary funds for the purpose. These funds, which in the Australian colonies are derived from sales or rents of crown-lands, are intended not for the purposes of relief to persons in this country; but to supply the colonists with the particular description of labour of which they stand most in need. New South Wales and South Australia are at present the only colonies which supply the means for emigration.

The colonies in which military and naval officers are allowed privileges in the acquisition of public lands are the following:—First, the Australian Settlements, consisting of New South Wales, Van Diemen's Land, South Australia, Western Australia, and New Zealand; secondly, Ceylon; thirdly, Nova Scotia and Cape Breton, the only province in North America where privileges are still allowed.

The business of regulating emigration has been undertaken to some extent by the government. First, an agent-general for emigration was appointed. This officer introduced many judicious plans for rendering the passage of emigrants across the ocean as free as possible from discomfort, and a code of rules was framed to secure this and other objects. The functions of the agent-general for emigration are now exercised by the Land and Emigration Commissioners. Emigrants are also protected by the Passengers' Act. The act 5 & 6 William IV. c. 5, passed in 1835, having proved insufficient for the purpose, a new act was passed in 1842 (5 & 6 Vict. c. 107). Its objects are to regulate the number of passengers in each ship, and to provide for their proper accommodation on board; to ensure a proper supply of provisions and water for their use; to provide for the sea-worthiness of the vessels; and to protect emigrants from the numerous frauds to which at various stages of their undertaking their helplessness and inexperience expose them. If the ship does not sail on the day mentioned in the agreement, the Passengers' Act compels the captain to victual the emigrants just the same as if the voyage had commenced; and they are entitled to remain on board forty-eight hours after the ship reaches her destination.

As a further protection to emigrants, and to enforce the provisions of the Passengers' Act, government emigration agents are appointed for the ports of London, Liverpool, Plymouth, Glasgow and Greenock, Dublin, Cork, Belfast, Limerick, Sligo, and Londonderry. These officers act under the immediate directions of the Colonial Land and Emigration Commissioners. They procure and give gratuitously information as to the sailing of ships, and means of accommodation for emigrants; and whenever applied to for that purpose, they see that all agreements between ship-owners, agents, or masters, and intending emigrants, are duly performed. They also see that the provisions of the Passengers' Act are strictly complied with, viz. that passenger-vessels are sea-worthy, that they have on board a sufficient supply of provisions, water, medicines, &c., and that they sail with proper punctuality. They attend personally at their offices on every week-day, and afford gratuitously all the assistance in their power to protect intending emigrants against fraud and imposition, and to obtain redress where oppression or injury has been practised on them.

In the colonies there are government immigration agents. The duties of these officers are to afford gratuitously to immigrants every assistance in their power by way of advice or information

as to the districts where employment can be obtained most readily, and upon the most advantageous terms, and also as to the best modes of reaching such districts.

At the following places of the United Kingdom there are Government Emigration Agents:—

Great Britain and Ireland.—London (Office, 70, Lower Thames-street), Liverpool, Plymouth, Glasgow and Greenock, Dublin, Cork, Belfast, Limerick, Sligo, Donegal, Ballina, &c., Londonderry, Waterford.

In the Colonies there are Government Immigration Agents in the following places:—

Canada.—Quebec, Montreal, Kingston, Bytown, Port Hope and Cobourg, Hamilton.

New Brunswick.—St. John's, St. Andrew's, Chatham (Miramichi), Bathurst, Dalhousie.

West Indies.—Jamaica, British Guiana, Trinidad.

Sierra Leone.

New South Wales.—Sydney, Port Philip.

Van Diemen's Land.—Launceston.

Western Australia.—Perth.

South Australia.—Adelaide.

New Zealand.—Auckland.

Emigration is one of the 'modes of relief' contemplated by the Poor Law Amendment Act (4 & 5 Wm. IV. c. 76). In some years a large number of persons have emigrated with the assistance of funds obtained under the act. By sect. 62 of the Poor Law Act, owners and ratepayers are empowered to raise money on security of the rates for the purposes of emigration, under the authority of the Poor Law Commissioners. The sum so raised must not exceed half the average yearly rate of the preceding three years, and it must be repaid within five years. The money is advanced to emigrants by way of loan, and is recoverable against persons above the age of twenty-one, who, having consented to emigrate, refuse to do so after the expenses of emigration have been incurred; and the loan is also recoverable if persons who emigrate shall return to this country.

By the act 7 & 8 Vict. c. 101, for the Amendment of the Poor Laws, it is provided that the boards of guardians are exclusively to apply money raised or borrowed for the purpose of emigration.

Under the Irish Poor Law Act, money may be raised for enabling poor persons to emigrate to British colonies; but the money so raised must not exceed one shilling in the pound on the net annual value of rateable property.

The Bounty System derives its name from the mode in which the proceeds of land-sales are applied in obtaining immigrants. In this case persons who introduce persons into the colony receive so much per head, according to the terms of agreement. The contractors engage to find persons willing to emigrate, and undertake to land them in the colony. This system is in force only in some of the Australian colonies. In New South Wales 51,736 persons were introduced from 1831 to 1842 under bounties.

The Land and Emigration Commissioners are required by their official instructions to prepare and issue 'a distinct and compendious account of whatever relates to the agriculture, the commerce, the natural products, the physical structure, and the ecclesiastical and political institutions of each of the colonies in which they offer land for sale. The commissioners in pursuance of this object issue occasionally a 'Colonization Circular,' which contains matter calculated to be of use to emigrants or persons who intend at some time to settle in the colonies.

Emigration from the United Kingdom during the 23 years from 1825 *to* 1847 *inclusive.*

Years.	North American Colonies.	United States.	Australian Colonies and New Zealand.	All other Places.	Total.
1825	8,741	5,551	485	114	14,891
1826	12,818	7,063	903	116	20,900
1827	12,648	14,526	715	114	28,003
1828	12,084	12,817	1,046	135	26,082
1829	13,307	15,678	2,016	197	31,198
1830	30,574	24,887	1,243	204	56,907
1831	58,067	23,418	1,561	114	83,160
1832	66,339	32,872	3,733	196	103,140
1833	28,808	29,109	4,093	517	62,527
1834	40,060	33,074	2,800	288	76,222
1835	15,573	26,720	1,860	325	44,478
1836	34,226	37,774	3,124	293	75,417
1837	29,884	36,770	5,054	326	72,034
1838	4,577	14,332	14,021	292	33,222
1839	12,658	33,586	15,786	227	62,207
1840	32,293	40,642	15,850	1,958	90,743
1841	38,164	45,017	32,025	2,786	118,592
1842	54,123	63,852	8,534	1,835	128,344
1843	23,518	28,335	3,478	1,881	57,212
1844	22,924	43,660	2,220	1,873	70,686
1845	31,893	58,538	830	2,330	93,591
1846	43,439	82,239	2,347	1,826	129,851
1847	109,680	142,154	4,949	1,487	258,270
Total .	736,308	852,564	129,291	19,434	1,737,597

Average Annual Emigration from the United Kingdom for the last twenty-three years . } 75,547

EMIR-AL-OMRAH, or more correctly *Emîr-al-Omarâ*, i.e. 'the prince of princes,' or 'chief of chiefs,' is the designation of an office under the caliphat, endowed with almost unlimited authority, which was created in the year of the Hegira 324 (A.D. 935), became hereditary in the year 334 (A.D. 945), and continued till near the middle of the following century. The first created was by the caliph Al-Radhi, who finding his refractory vassals too strong for him, appointed Mohammed ben Râyek, the governor of Waset, the chief of them, commander of his armies and emîr-al-omarâ. His authority was resisted, and within ten years he was deposed, and several others occupied the place. In 945 the caliph Mostakfi elevated Moëzz-ed-daulah, prince of Ahwaz, to the dignity, who repaid the favour by deposing the caliph, conferring the vacant throne on Al-Moti-lillah, and rendering the office of emîr-al-omarâ hereditary in his own family, in which it continued till the subjugation of the caliphat by Togrul Bek, when in 1055, after Togrul had entered Bagdad, his descendant, Malek-er-Rahîm, abdicated his office while a prisoner in the hands of the Tartars. (Umbreit, *Commentatio exhibens Historiam Emirorum al Omrah ex Abulfeda*, Göttingen, 1816, 4to.)

EMLY, a bishop's see in the ecclesiastical province of Dublin, in Ireland, is now united with

Cashel, Waterford, and Lismore, thus forming the bishopric of Cashel, Emly, Waterford, and Lismore. [BISHOPRIC.]

EMMANUEL COLLEGE, Cambridge, was founded in 1584, by Sir Walter Mildmay. The original foundation was only for a Master, three Fellows, and four Scholars. There are now twelve Foundation Fellowships, besides one founded by Mr. Gillingham, the holder of which receives a dividend arising from a distinct estate, but is in most other respects on an equality with the Foundation Fellows. These thirteen fellowships are open to Englishmen of all counties, without any restriction, and a person becomes eligible when he has taken the degree of B.A. The four Senior Fellows are obliged to take priests' orders. Sir Wolstan Dixie, some time lord mayor of London, a contemporary of the founder, gave lands for the support of two Fellows, distinct from those of the foundation. These Fellows have no vote in college affairs, nor have they any claim to the offices or dividends of the college. Candidates for these fellowships must have taken the degree of B.A., and must be related to the founder, or have received their education at Market-Bosworth School, in Leicestershire. There are likewise four scholarships of Sir Wolstan Dixie's foundation, subject to the same restrictions. The Foundation Scholarships are open to Englishmen of all counties. The scholars receive upwards of 21*l.* per annum in addition to the weekly payment of 1*l.* 1*s.* during residence. Besides these there are many scholarships and exhibitions, founded by various benefactors, to be given to the candidates most distinguished for learning and exemplary conduct. Various annual prizes are given in this college: amongst them, plate to the amount of 12*l.* to the best proficient in mathematics among the commencing bachelors of arts. The number of members of this society upon the college boards, according to the University Calendar of 1848, is 284. There are 19 benefices in the patronage of the society.

Emmanuel College is situated at the south-east side of the town, and consists of a front next the street, which has a central Ionic portico, beneath which is the entrance to the principal court, 128 feet by 107 feet, consisting of Cloisters and Gallery, Hall, Combination Room, Master's Lodge, and Chapel.

(Lysons' *Magna Britannia—Cambridgeshire; Cambridge University Calendar for* 1848.)

EMMERICH. [DÜSSELDORF.]

EMMIUS UBBO, was born at Gretha, in East Friesland, in the year 1547. His father was a clergyman of the Lutheran communion. Emmius studied at Bremen, Rostock, and lastly at Geneva, where he became intimate with Beza. He afterwards returned to his native country, and in 1589 was made rector of the school of Norden, in East Friesland. In 1594 he was appointed to the chair of history and the Greek language in the College of Groningen, and when the University of Groningen was instituted in 1614, Emmius was made rector of the same. Among his historical works, the most important is the 'Vetus Græcia Illustrata,' 3 vols., Leyden, 1626. He died in 1625.

EMPANNEL. [PANEL.]

EMPE'DOCLES, a native of Agrigentum in Sicily, who flourished about B.C. 450: he was a philosopher, a poet, and a statesman. The story of his throwing himself into the crater of Ætna is a fable.

By some writers he is called a Pythagorean, in consequence of a resemblance of doctrine in a few points. But the principles of his theory show that he belongs to the Eleatic school. The exposition of his doctrine belongs to a treatise on philosophy. (Ritter, 'Geschichte der Philosophie,' i. 652.) The Fragments of Empedocles were published with a commentary by Fr. W. Sturz, Leipzig, 1805, 8vo.

EMPEROR, from the Latin *Imperator*. Among the early Romans the title of Imperator was bestowed by the acclamations of his soldiers in the camp on a commander-in-chief who had signalized himself by a victory. (Tacit. 'Annal.' iii. 74.) But the word Imperator was properly applied to him who had what the Romans called Imperium, which was conferred on the Roman kings by the Comitia Curiata (Cicero, 'De Repub.' ii. 17). Under the Republic the title was sometimes conferred on an individual for the occasion of a triumph (Livy, xxvi. 21; xlv. 35). Cicero ('Philipp.,' ix. 16) defines Imperium to be 'that power without which military affairs cannot be carried on, an army commanded, or a war conducted.' The name used by the Greek historians of Rome to express Imperator is Autocrator (αὐτοκράτωρ), one who has full power, from which is derived the word autocrat, which is sometimes applied to the Emperor of Russia. C. Julius Cæsar assumed the name Imperator as a prænomen, or title (Imperator C. Julius Cæsar), a practice which was followed by his successors, as we may observe on their coins. (Suetonius, 'Cæsar,' 76.) There are examples of this title on the coins of Antoninus, Aurelius, and other Roman emperors. After the time of the Antonines the term Imperator seems gradually to have grown into common use as one of the titles which expressed the sovereign of the Roman world, though the name Princeps was also long used as indicating the same rank and power.

From the emperors of the West this title, in the year 800, devolved to Charlemagne, the founder of the second or German empire of the West. Upon the expiration of the German branch of the Carlovingian family, the imperial crown became elective, and continued so until the last century, when the title of Emperor of Germany ceased. Francis II. laid it aside, and assumed the title of Emperor of Austria. The only other European potentate who uses the style of emperor is the autocrat of Russia: but in the present year (1848) the Germans have formed a new empire for the whole of Germany, of which the Archduke John, uncle of the emperor of Austria, is the present head.

EMPETRA'CEÆ, a small natural order of polypetalous exogens, related to *Euphorbiaceæ*. They are small acrid plants, of no known use.

Empetrum nigrum, the Crakeberry or Crowberry, is wild on the mountainous heaths in the north of England.

EM'PHASIS, in articulation, is the mode of drawing attention to one or more words in a sentence by pronouncing them with a greater volume and duration of sound, and in a higher or lower note than the adjoining words.

EMPHYTEUSIS (ἐμφύτευσις). The term expresses in the Roman law a perpetual right to the enjoyment of land, on condition of paying annually a fixed sum (canon, pensio) to another person who was the owner of the land. This relationship of occupier and owner was founded on contract, which in the later empire received the name of contractus emphyteuticarius. ('Inst.' 3, tit. 24.) The occupier was called emphyteuta.

The title of the emphyteuta depended on his paying what he had contracted to pay, and also all the taxes to which the property was liable. If he neglected to pay these dues for three years he might be ejected out of the land by the owner, without having any compensation for his improvements. He could alienate the land after giving notice to the owner, who might however, if he pleased, take the land at the price fixed by the emphyteuta. If he did not, then the emphyteuta could sell it to any person who was able to answer all the demands to which the land was subject by virtue of the contract. In each case the owner was bound to receive the purchaser as his emphyteuta, and confirm his title in due form, for which he could claim a payment not exceeding a fiftieth part of the price at which the land was sold.

The subject of the emphyteusis is explained, *Dig.* 6, tit. 3; *Cod.* 4, tit. 66; Savigny, *Das Recht des Besitzes*, p. 99, &c., 5th ed.; Vangerow, *Pandekten*, &c., i., p. 726.

EMPIRIC. This word is derived from the Greek (ἐμπειρικός, empeirikos) and means a man who derives his knowledge from experience. A medical sect which arose in opposition to that of the Dogmatics assumed the name of Empirics. Serapion of Alexandria and Philinus of Cos are regarded as the founders of this school.

If the empirics had remained true to their principles their name would stand high among the medical profession. But having abandoned the study of nature, and with it all scientific pursuits, they sank into such disrepute, that their name became a stigma. And even in our days, when empiricism is the character of modern science and philosophy, the name of empiric is still bestowed as an opprobrious term upon all ignorant pretenders in the medical art.

EMPYE'MA (ἐμπύημα, from ἐν, 'in,' and πῦον, 'pus,' a word which signifies an internal collection of pus). Although this term was restricted by the ancients to purulent collections in the thorax, it is now employed to signify all collections of fluid in the pleura which do not arise from an obstruction to the circulating system, and are not of a gaseous nature. In a natural state the pleura, like other serous membranes, secretes a clear fluid, which is removed by absorption as quickly as it is formed. But from the existence of inflammation or the presence of foreign bodies, other fluids often accumulate. The most common of these are serum, blood, pus, and fibrinous matter. Any of them may be present alone, or may be mixed in varying proportions. It is however almost impossible to ascertain by any external means the nature of the fluid which has accumulated.

The worst effect of the presence of fluid in the pleura is exerted on the lung. By its pressure the lung becomes incapable of expanding for the admission of air. Its position is generally by the side of the spinal column, but through the deposition of the fibrinous matter the pleura of the lungs and of the ribs often contract adhesions, and in this manner the lungs may be forced to occupy very varied positions in the cavity of the thorax. When the effusion is extensive the lung becomes flattened and flaccid, its surface is corrugated, and its tissue becomes soft, pliant, and dense, exhibits no crepitation, and is almost entirely deprived of blood. It does not often become inflamed in this state, but frequently becomes the seat of the deposition of tuberculous matter.

Empyema is always attended with inflammation acute or chronic of the pleura [PLEURITIS], although the bursting of an abscess or the wounding of a blood-vessel may assist in producing the accumulated fluid contents of the pleura. At the same time it frequently happens that the inflammatory symptoms are of so mild and insidious a nature that they are entirely overlooked. This was more frequently the case previous to the use of percussion and auscultation than at the present day. There are few diseases with which empyema is likely to be confounded. Its general symptoms resemble those of tubercular phthisis, but the history of the disease, and more particularly the stethoscopic signs, will point out the distinction.

The treatment of empyema may be of two kinds, medical and surgical. The general principles on which the first should be conducted are those which would be applied in pleuritis. It however often happens that the resources of medicine fail, and that no other chance of relief can be offered the patient than that of drawing off the effused fluid by means of an operation. This is called the operation of empyema, or paracentesis thoracis. This operation, although in modern times it has got much into disrepute, was performed by Hippocrates (Hipp., 'De Morbis,' lib. ii. 576; Galen, 'Comment.,' Aph. 27) and the older practitioners of surgery, with apparently much success. It has recently been recommended, especially by Laennec, in cases of empyema which do not offer a chance of being cured by medical treatment. In such cases, where all other remedial means have been tried, there seems an increasing conviction that this operation may be had recourse to with every chance of benefit; and cases have now been recorded, both in the practice of the French and English hospitals, in which a large proportion of those operated on have recovered.

EMPYREUMA, the peculiar smell and taste resulting from the action of heat upon organic substances in close vessels. Destructive distillation goes on so as to produce an oil which has a strong empyreumatic smell and taste.

EMS, the ancient *Amisia*, a river in the north-west of Germany, which has its source in a hill called Stapelag, near Paderborn in Westphalia. Its course is first W., and then N.W. past Wahrendorf and Rheine, where it quits the Prussian territory and enters Hanover. Through Hanover it flows in a northern direction for about 70 miles, to its entrance into Dollart Bay, near Emden, by two mouths, the Oster Ems and the Wester Ems. In this part of its course, by means of canalization and deepening the bed of the river, the Ems is navigable. The Hanoverian towns on its banks are — Lingen, Meppen, Papenburg, and Leer. The whole length of the river is about 210 miles, and it is navigable for vessels of 80 or 100 tons burden as high as Papenburg, where it ceases to be affected by the tides. Its principal tributaries on the right bank are the Hase, which, passing Osnaburg, falls into it at Meppen; and the Leda, which enters Hanover from the duchy of Oldenburg, and joins the Ems near Leer. On the left bank the Ems receives the Aa to the south-west of Papenburg.

EMU. [STRUTHIONIDÆ.]

EMULSION, a term applied to mixtures which generally have a milky appearance, and which, in some cases, are partial solutions, in others merely mechanical suspensions of oily or resinous substances: thus oil of almonds may be for a time diffused through water by trituration, but will ultimately separate and float on the surface. Emulsions should be used soon after being formed, as in a few hours the constituent parts separate or become acid.

ENAMELLING is the art of using enamel. There exists evidence that the Egyptians practised the art, but this cannot be affirmed of the Greeks. The Romans however have bequeathed abundant evidence that they were acquainted with the art, and practised it extensively, at least in the time of the Lower Empire.

Enamelling divides itself into two branches —transparent and opaque. The first is employed for the purpose of ornamenting gold and silver snuff-boxes, watch-cases, and various articles of jewellery. Previously to the application of the enamel various patterns and devices are *brightcut* with the graver or the rose-engine, when the cuts reflecting the rays of light from their bright and numerous surfaces exhibit through the richly coloured enamels with which they are encrusted a beautiful play of colours. Sometimes this enamelled bijouterie is further adorned with paintings in enamel executed on rich transparent grounds.

Opaque enamelling is employed in the manufacture of watch and clock dials and of plates for pictures. For this purpose the enamel is first broken with a hammer into small pieces and then ground with a pestle and mortar formed of agate. It is then spread evenly on a plate of copper, which has been prepared for its reception, and being passed through the furnace the enamel is melted, and adhering firmly to the metal, thus forms an enamel plate. For the best kind of dials a second coat of enamel is laid over the first, and for pictures a third is added. The figures are painted on the dials in a vitrifiable colour, when they are again subjected to the heat of the furnace, which melting the colour and softening the enamel at the same time, incorporates the two into one body, and thus permanently fixes the painting. Gold is frequently used instead of copper for small enamel pictures. When the enamel plate is prepared, the artist proceeds to paint his picture in a similar manner to that which is pursued by the painter in oil or water colours; a principal difference being, that instead of waiting for the colours to dry before proceeding to lay on another coat of colour, he has his work passed through the fire, by which process the colours are imperishably and immovably fixed. Paintings in enamel are usually subjected to the furnace ten or twelve times, and in some cases oftener. The colours are composed of a colourless glass as a base, the colouring matters being metallic oxides. Thus silica, borax, and the red oxide of lead, form a base or flux for some colours. The habitudes of the various oxides however require that each should be treated with reference to its peculiar properties: for instance, the flux which, employed with gold, is best adapted for the production of a useful and beautiful colour, is wholly inefficient if used with cobalt.

The nature of the material and the expense attendant upon attempts to produce large works in enamel have tended to restrict the dimensions of enamel paintings. Until the time of the late H. Bone, R.A., but few attempts had been made to extend their size beyond that adapted for trinkets. This artist, with amazing perseverance and industry, overcame innumerable difficulties, and exhibited for a long series of years enamels of large dimensions. The largest works which have been executed in enamel are, 'Bacchus and Ariadne,' after Titian, by H. Bone, R.A.; and a '*Holy Family*,' after Parmegiano, by Chas. Muss. The former measures 16½ inches by 18; and the latter, 15¼ inches by 20¼. George Bowles, Esq., purchased the Bacchus and Ariadne for 2200 guineas, and His Majesty George IV. gave 1500 for the Holy Family. This last now forms part of the Collection in Buckingham Palace.

The power of resisting decay renders enamel a valuable medium for conveying down the stream of time the likenesses of celebrated individuals. The artists who practise this durable and beautiful style of painting have not at any time been numerous, and at present there are in England only two who have attained any eminence: these are Mr. William Essex, Enamel Painter in Ordinary to the Queen, and Mr. H. P. Bone, Enamel Painter to the Queen.

To what is stated under the above head we may add a few words upon the process which has been extensively practised of late years of enamelling the interior of cast-iron and other hollow articles, such as saucepans and other culinary and domestic utensils. The superior cleanliness of such articles, and the security which they afford against any metallic taint, render them peculiarly valuable for some delicate operations in cookery and confectionary, and for the preparing of pharmaceutical decoctions, extracts, &c. The enamel used for this purpose may be stated, in general

terms, to consist of silica, soda, borax, and potter's clay. For details see Dr. Ure's *Supplement* to his *Dictionary of Arts, &c.*.

(*London and Edinb. Phil. Mag.*, June, 1837; *Archæological Journal*, Vol 2.)

ENAMELS are vitrifiable substances, and may be divided into two kinds, transparent and opaque. The basis of all enamel is a white transparent glass. The addition of some of those metallic oxides which merely impart colour, as gold, silver, copper, cobalt, &c., convert this into a transparent enamel; while those of tin and antimony, which render it opaque without imparting colour, form a white opaque enamel. There is also a material, of which the commercial name is glass-enamel, the opacity of which arises from the presence of arsenic. This substance is very glassy, brittle, easily scratched, readily fusible, and very white: it is used for making the common kinds of watch and clock dials, ornaments for the mantel shelf, the toilet, &c.

Enamel is made in some of the English glass houses, but the best is imported from Italy. This is in the form of circular cakes, measuring from about three to about seven inches in diameter, and half or three quarters of an inch in thickness. It is cream coloured, heavy, less brittle than glass, is sufficiently hard to scratch crown glass; its fracture is conchoidal and exhibits a resinous lustre, and it fuses at a temperature a little below that which melts gold. It is sold at from 12*s.* to 20*s.* per lb.

ENAREA, a country in Africa, south of Abyssinia. It lies between 6° and 8° N. lat., and between 33° and 37° E. long. It is described as more elevated than all the countries which surround it. In the centre is a group of very high mountains called Kheresa. A great portion of the country is covered with forests, in which several kinds of trees are found which bear edible fruits, and one of them is used for dyeing black. Elephants, giraffes, buffaloes, and other wild beasts abound. The capital is Sakka, which is visited by caravans which come from Basso and Gondar in Abyssinia. The inhabitants belong to the widely spread nation of the Galla, and are mostly pagans. (Isenberg's and Krapf's *Travels in Abyssinia*.)

ENCAMPMENT is the lodgment or station of an army, with its artillery, baggage, and stores, when it has taken the field for the purpose of a review, or of acting against an enemy.

In a description of the camp formed by Edward I. during his expedition to Scotland in 1301, is contained the first hint we have of any regularity in the distribution of an English army while in the field; this amounts however to little more than that the ground was marked out, and that to every one his proportion of the space was assigned. Within the spaces, tents of white or coloured linen were set up, and huts were constructed, the latter probably for the private soldiers. (Grose, 'Mil. Antiq.,' vol. ii., p. 205.)

In the modern system of war, from the necessity of avoiding as much as possible the destructive effects of the enemy's artillery, and the desire of affording all possible development to the fire of their own infantry, commanders of armies have been compelled to abandon the square form of the ancient encampments, and to adopt that of long and narrow lines. But with this arrangement it seldom happens that the ground will permit a perfect regularity in the dispositions of the several battalions and squadrons. When however an army is encamped under tents, it may be regarded as a general rule that the line should correspond to that in which the troops are to be drawn up to engage the enemy; also that the tents of each battalion should not occupy a greater space in front than the battalion itself would cover when in order of battle.

The length of the front of a battalion of 750 men, two deep, allowing 21 inches to each file, will be 219 yards; and this would be the extent of the line of tents, were it not that the line is determined by the probable number of effectives, instead of the numerical strength of the establishment. The depth of the encampment for a battalion is of less importance; but, when the ground will permit, it may be regulated as follows:—

The tents of the privates may be ranged in two lines parallel to the front, with an interval of about 12 feet as a street between every two companies in each line, and those of the captains and subalterns may be in one line in the rear of these; the field-officers and the commanding officer may occupy a fourth line; the staff a fifth; and the line of kitchens may be in the rear of all.

The length of front for a complete regiment of cavalry, consisting of eight troops, when formed two deep, is about 320 yards; and this may be considered as the extent occupied by the regiment in the line of the encampment. The seven tents of each troop are ranged in a line perpendicular to the front, and the horses are attached to pickets in lines parallel to those of the tents; the remainder of the space, reckoned parallel to the front, being occupied by the breadths of the streets. In the rear of the men's tents and parallel to the front are arranged the subalterns' horses in one line; the tents of the captains and subalterns in another; those of the field-officers and commanding officer in a third, and the kitchens in the rear of all.

A large army is encamped in two lines which, if the ground will permit it, are parallel to and at the distance of about 300 yards from each other; and a reserve, generally consisting of the best troops, is formed in rear of the second. The stations of the cavalry are on the flanks of each line. The artillery attached to an army is posted either on the flanks of the camp or with the reserve in the rear.

The circular tents at present in use are 13 feet 3 inches diameter within the walls (the canvas which hangs vertically between the conical part of the tent and the ground). Of the cavalry 12 men, and of the infantry 15 men, are appointed to each tent.

The great extent of the space which, for the reasons before mentioned, is unavoidably occupied by an army in the field, renders it, in most cases, impossible to fortify the site of the encampment

by a continuous line of parapet like that with which the Roman armies surrounded themselves on taking up a defensive position; and the security of a modern army against surprises is now obtained principally by the situation being difficult of access, from streams, marshes, or inequalities of the ground, and by keeping numerous advanced posts to watch all the approaches by which an enemy might arrive at the camp.

A continuous line of works may however be admissible for an army inferior to that of the enemy, provided the extent of the line be not so great as to prevent the intrenchments from being sufficiently manned in every part; but a camp so fortified would possess no advantages for an army which is strong enough to assume the offensive on a favourable occasion presenting itself; and it is evident that, in this case, it would be sufficient to construct merely a few redoubts in situations from whence a fire of artillery might be directed for the purpose of defending the approaches, while the disposable force of the army might be kept in masses ready, at a proper time, to make a movement to the front through the intervals between the works.

One of the finest examples of an intrenched camp was afforded in that which the British army occupied before Lisbon in 1810. This consisted of a double line of detached redoubts constructed on all the commanding points of ground, for the purpose of defending the four great roads and the accessible passes by which the enemy could approach to that city. The first line began at the mouth of the Zizandra on the Atlantic; it crowned the heights above Torres Vedras, and following the chain of Monte Graça, extended to the Tagus at Alhandra, its whole length being about 29 miles. The second was about six miles in the rear of the first. The weakest part seems to have been the valley of Calhandria, near the Tagus, on the exterior line; but this part was afterwards strengthened by a double row of *abatis*, besides breastworks of earth and thick stone walls. When the lines were completed, they consisted of 152 redoubts, armed, in all, with 534 pieces of ordnance, and required above 34,000 men for their garrisons.

ENCAUSTIC PAINTING (ἐγκαυστικὴ) is a kind of painting in which, by heating or burning in, the colours were rendered permanent in all their original splendour. It was not however enamelling, but a mode of painting with heated or burnt wax, which was practised by the ancients. Pliny ('Nat. Hist.' xxxv.) describes three modes of encaustic painting. In the first mode, the wax was melted, mixed with as much earth colour finely powdered as it could imbibe, and then this mass spread on wood, or on a wall, with a hot spatula. When it became cold it was the ground, in which the designer cut the lines with a cold pointed tool (style, cestrum). In the second mode, ivory tablets were covered with red or black wax, and the design cut in it with the style, the object being to use the clear and smooth surface of the ivory for the lines, that they might look the more beautiful. The third kind was the applying the colours with the pencil. The wax was dissolved, the colours mixed with it, and laid on with the pencil, and the painting then finished by careful approximation to the fire: for this purpose a hot iron (cauterium) was used. When painting had been greatly improved by the invention of the pencil, a new method of encaustic was attempted. Encaustic wax painting had hitherto been designing on a coloured ground; it now became painting with wax colours burnt in. When the artist had laid on the wax ground, and traced the outlines with the style, he proceeded to the colouring. From the wax mixed with the colours he separated with the hot style as much as he wanted to cover a certain space, and spread it over the ground, put a second, third, &c., colour next the first, so that he had local tint, half tint, and shade together, which he softened into each other with the hot style.

This art, having been long lost, was revived by French and German artists in the 18th century, and is now occasionally practised.

EN'CHODUS, a genus of fossil Cycloid fishes, from the chalk. (Agassiz.)

ENCKE'S COMET, one of the periodic comets which have been ascertained to belong to the solar system, revolving round the sun in about 1210 days, within the orbit of Jupiter.

This comet is now known to have been seen in 1786 by Méchain and Messier, in 1795 by Miss Herschel, and in 1805 by M. Pons of Marseilles, and others. But the train of investigation which established it as a *periodic* comet (all the preceding observations having been supposed to be of different bodies) dates from the observations of M. Pons in 1818-19. A comet having been then discovered by him and its elements determined, Encke (from whom the comet has its name) immediately showed that it was the body which had been seen in 1805. Olbers detected it to be the comet of 1795; and Encke ('Berlin Ephemeris,' 1822 and 1823) having established the fact that its revolution was completed in about 1200 days, predicted approximately the part of the heavens in which it would reappear in 1822. The prediction was verified by the observations of M. Rumker at Paramatta, since which time it has regularly taken its place as one of the bodies of the solar system. The next approach to perihelion is in the autumn of the present year (1848).

ENCRINITES, the name by which the petrified radiated animals commonly called *Stone Lilies* have been long known in Britain. It is frequently applied to the *Crinoidea* generally, both recent and fossil.

Lamarck arranged the genus *Encrinus* in his fifth order of Polypes (*Polypi natantes*), fixing its position between *Vergularia* and *Umbellularia*, and recording but two species, one recent, viz. *Encrinus Caput Medusæ* (*Isis Asteriæ*, Linn.), from the seas of the Antilles, the other fossil, viz. *Encrinus liliiformis, Lilium lapideum* (Stone Lily) of Ellis and others.

Cuvier included the Encrinites among his Pedicillated Echinoderms, considering that they should be placed near the *Comatulæ*, between the great group of the *Star-Fishes* and that of the *Echinidians*.

De Blainville observes that the beautiful work

of Guettard (' Acad. des Sc.' 1755) upon the living and fossil encrinites showed long ago the great relationship which there is between these and the Stellerideans, now known under the name of *Comatulæ*, and he remarks upon the arrangement of Lamarck, who followed Linnæus and his adherents in placing them among the zoophytes, notwithstanding Guettard's exposition and Ellis's confirmation. After alluding to Miller's work on the family, and to Mr. Thompson's description of the living specimen found on the coast of Ireland, De Blainville takes as the basis of his terminology the parts which exist in *Comatula*, and adopting the views of Rosinus, rejects that proposed by Miller in his interesting memoir, objecting to the terms *pelvis, costal, intercostal, scapula, hand, fingers*, &c., as derived from animals of an entirely different type of form, and inapplicable to the radiated structure.

We find, then, that the *pelvis* of Miller is the *centro-dorsal joint* (*l'article centro-dorsal*) of De Blainville. The *costal* is the first *basilary joint* of each ray. The *intercostal* is the second *basilary joint*. The *scapula* is the third, or that on which the radii are supported. The *hand* is the part of the ray which is divided but not separated. The *fingers* are the *digitations* or divisions of the rays. Finally, the *pinnules* are the lateral divisions of the digitations; and De Blainville, like Miller, divides the *rays* into *principal rays*, and *accessory* or *auxiliary rays**.

Habits, &c.—Dr. Buckland (' Bridgewater Treatise'), who uses the phraseology of Miller, speaks of these animals as destined to find their nourishment by spreading their nets and moving their bodies through a limited space, from a fixed position at the bottom of the sea; or by employing the same instruments, either when floating singly through the water, or attached like *Pentelasmis* [CIRRIPEDA] to floating pieces of wood. He refers to Miller for several instances of their power of repairing casual injuries, and figures a recent *Pentacrinus*, one of whose arms is under the process of being reproduced, as crabs and lobsters reproduce their lost claws and legs, and many lizards their tails and feet, observing that the arms of star-fishes also, when broken off, are in the same manner reproduced. The same author remarks, that although the representatives of the crinoïdeans in our modern seas are of rare occurrence, this family was of vast numerical importance among the earliest inhabitants of the ancient deep. 'We may judge,' says Dr. Buckland, 'of the degree to which the individuals of these species multiplied among the first inhabitants of the sea, from the countless myriads of their petrified remains which fill so many limestone-beds of the transition formations, and compose vast strata of entrochal marble, extending over large tracts of country in Northern Europe and North America. The substance of this marble is often almost as entirely made up of the petrified bones of encrinites as a corn-rick is composed of straws. Man applies it to construct his palace and adorn his sepulchre, but there are few who know, and fewer still who duly appreciate, the surprising fact, that much of this marble is composed of the skeletons of millions of organized beings, once endowed with life, and susceptible of enjoyment, which, after performing the part that was for a while assigned to them in living nature, have contributed their remains towards the composition of the mountain masses of the earth. Of more than thirty species of crinoïdeans that prevailed to such enormous extent in the transition period, nearly all became extinct before the deposition of the lias, and only one presents the angular column of the pentacrinite: with this one exception, pentangular columns first began to abound among the crinoïdeans at the commencement of the lias, and have from thence extended onwards into our present seas. Their several species and even genera are also limited in their extent; *e. g.* the Great Lily Encrinite (*E. moniliformis*) is peculiar to the muschel-kalk, and the Pear Encrinite to the middle region of the oolitic formation.'

The same author, speaking of the joints which composed the stem, says, 'the name of Entrochi, or wheelstones, has with much propriety been applied to these insulated vertebræ. The perforations in the centre of these joints affording a facility for stringing them as beads, has caused them in ancient times to be used as rosaries. In the northern parts of England they still retain the appellation of St. Cuthbert's Beads.

> On a rock by Lindisfarn
> Saint Cuthbert sits, and toils to frame
> The sea-born beads that bear his name.

'Each of these presents a similar series of articulations, varying as we ascend upwards through the body of the animal, every joint being exactly adjusted to give the requisite amount of flexibility and strength. From one extremity of the vertebral column to the other, and throughout the hands and fingers, the surface of each bone articulates with that adjacent to it, with the most perfect regularity and nicety of adjustment. So exact and methodical is this arrangement, even to the extremity of its minutest tentacula, that it is just as improbable that the metals which compose the wheels of a chronometer should for themselves have calculated and arranged the form and number of the teeth of each respective wheel, and that these wheels should have placed themselves in the precise position fitted to attain the end resulting from the combined action of them all, as for the successive hundreds and thousands of little bones that compose an Encrinite to have arranged themselves in a position subordinate to the end produced by the combined effect of their united mechanism, each acting its peculiar part in harmonious subordination to the rest; and all conjointly producing a result which no single series of them acting separately could possibly have effected.' ('Bridgewater Treatise.')

* It is necessary to put the student on his guard against the confusion and error manifest in this part of M. de Blainville's useful work. This was not a little puzzling when considered as coming from a pen of such high reputation as his, till the arrival of the 'Nouvelles Additions et Corrections' brought the information that 'par une transposition singulière du manuscrit, il y a eu une sorte de *mélange* entre les paragraphes qui appartiennent aux genres *Encrinus* et *Pentacrinus*.' In short, among other mistakes, the titles *Encrinus* and *Pentacrinus*, together with whole paragraphs, have been misplaced.

De Blainville characterizes his Fixed Asterencrinideans (*Astérencrinides Fixés*) as having a *body* more or less bursiform, supported upon a long articulated stem, and fixed by a radiciform part.

The genera into which the *Encrinites* are divided are very numerous. They are as follows:—

GENERA.

1. *Apiocrinites* (Miller). Fossil only, in strata posterior to the lias. Examples: *A. rotundus*; the Bradford Pear Encrinite of Parkinson. *A. ellipticus* (Miller); *A. rosaceus*; *A. mespiliformis*, and *A. Milleri* (Schlotheim); *A. flexuosus*, and *A. conicus* (Goldfuss).

2. *Encrinus* (*Encrinites*, Miller). Fossil. Example, *Encrinites liliiformis* (Lamarck), the Lily Encrinite (*Encrinites moniliformis*, Miller). Locality (Muschel-kalk), Hildesheim, and other places in Germany.

3. *Pentacrinus* (*Pentacrinites*, Miller, *Pentagonites Rafinesque*). Recent species, *Pentacrinus Caput Medusæ*. Locality, the seas of the Antilles. Of this rare and beautiful Encrinite one specimen exists in the British Museum; another is preserved in the Paris Museum; there is also a specimen in the Museum of the Royal College of Surgeons, London; and one in that of the Geological Society of London. Fossil species, *Pentacrinus Briareus*, or Briarean Encrinite, from the lower strata of the oolite formation, especially the lias. Several other species are described by Miller and Goldfuss.

4. *Phytocrinus*. Example, *Phytocrinus Europæus* (*Pentacrinus Europæus*, Thompson). This is a small species which has been discovered in the Cove of Cork and other parts of the coast of Ireland. According to Mr. Thompson.('Proceeds. Royal Soc.' Lond., June, 1835), this Encrinite is fixed by its stem to other bodies in early life only; it is produced from the ovum of a Comatula, becomes afterwards detached, and forms a perfect Comatula capable of moving freely in the ocean, crawling sometimes among submarine plants, and at others floating or swimming like the Medusæ. If this be the case, it must be removed from within the pale of the Encrinites.

5. *Poteriocrinites*. Fossil only. Locality, mountain limestone. Example, *Poteriocrinites tenuis*.

6. *Platycrinites*. Fossil only. Locality, mountain limestone of Mendip Hills and other places. Example, *Platycrinites lævis*.

7. *Cyathocrinites*. Fossil only. Locality, magnesian beds of mountain limestone, at Cleveden, and elsewhere. Example, *Cyathocrinites planus*. Three other species are recorded by Goldfuss.

8. *Actinocrinites*. Fossil only. Locality, mountain limestone of Yorkshire, of the Mendip Hills, Black-Rock near Bristol, &c. Example, *Actinocrinites triacontadactylus*. Nave Encrinite of Parkinson. Miller describes another species, and Goldfuss refers several others to this genus.

9. *Melinocrinites* (Goldfuss). Fossil only. Locality, mountain limestone. Example, *Melinocrinites hieroglyphicus*.

10. *Rhodocrinites* (Miller). Fossil only. Locality, mountain limestone along the river Avon, near Bristol, Mendip Hills, &c. Example, *Rhodocrinites verus*.

11. *Eugeniacrinites* (Miller). Fossil only. Locality, Switzerland, at Mount Randen; also in the canton of Zurich, and at Schaffhausen. Example, *Eugeniacrinites quinquangularis*. Clove Encrinite of Parkinson.

12. *Solanocrinites* (Goldfuss). Fossil only. Locality, Würtemberg Jurassic limestone. Example, *Solanocrinites costatus*.

13. *Caryocrinites* (Say). Fossil only. Locality, Lockport, in brown clay, at the foot of the ravine in which the New York Canal mounts the parallel ridge of Lake Ontario. Example, *Cariocrinites ornatus*.

14. *Marsupites* (Mantell). Fossil only. Locality, chalk-pits near Lewes, and other places in Sussex and in Kent. Example, *Marsupites ornatus*. Tortoise Encrinite of Parkinson.

15. *Pentremites* (Say). Fossil only. Locality, the vicinity of Bath; also in Kentucky, and on the margins of the Mississippi in a few places; numerous near Huntsville. Examples, *P. globosa* (England), *P. pyriformis*, and *P. florealis* (Kentucky). Mr. G. B. Sowerby has described several new species; some from the calamine mines on the Lancashire side of the Hodder, and one from the Derbyshire limestone. (See 'Zool. Journal,' vol. iv.)

ENCYCLOPÆDIA. [DICTIONARY.]

ENDE'CAGON, a figure of eleven sides.

ENDECA'NDRIA, the ninth class of the Linnæan system of botany.

ENDEMIC. By this word are expressed *those* peculiar forms of disease which arise spontaneously, as it is termed, in a country or in particular localities, and which are ordinarily produced by the peculiar climate, soil, air, water, &c. Thus, ague is the endemic disease of marshy countries or localities; the swelled throat or bronchocele is endemic in the Alps, and the plica in Poland. The word bears pretty much the same signification in relation to the diseases of a country that the term indigenous does to its plants. It is used in contradistinction to *epidemic*. [EPIDEMIC.]

ENDERY, or ENDRI. [ANDREEWA.]

ENDIVE, or *Cichorium endiva*, the parent of all the varieties of garden endive, was introduced into Britain about the beginning of the 17th century from the northern provinces of China. It is a species belonging to the narcotic lactescent division of *Compositæ*, to which it gives the name *Cichoraceæ*.

There are now many varieties in cultivation, which are divided into two principal groups, Batavian and Curled-Leaved.

As it is the leaves of this plant, and not its flowers or seed, which are used in culinary operations, it is necessary to be particular as to the time of sowing; for if sown early in spring, it will, instead of forming fine leaves, produce flowers and seed, and so frustrate the object of the cultivator. A little seed may be sown in the beginning of May for early use; but for a general crop, throughout the months of June and July to the

middle of August, will be found to be the proper time for sowing. The soil upon which the endive is sown or planted should be light and rich. After the plants are strong enough to be removed from the seed-bed and planted out where they are intended to remain, various methods are practised in order to blanch the leaves. Some gardeners cover them with flower-pots, others merely tie them together with matting. By either method the leaves are not only colourless but less bitter than they would have been otherwise.

In this country the Cut-Leaved or Curled Endive is preferred for table; but the Dwarf White Batavian Endive is much more delicate and agreeable to the palate.

ENDOCARP. [PISTIL.]

ENDOGENITES, the name for certain fossil plant-stems, as *E. erosa*, from Tilgate. (Mantell.)

ENDOGENS. One of the large primary classes into which the vegetable kingdom is divided bears this name in consequence of its new woody matter being constantly developed in the first instance towards the interior of the trunk, only curving outwards in its subsequent course downwards. That palm-trees grow in this way was known so long since as the time of Theophrastus, who distinctly speaks of the differences between endogenous and exogenous wood.

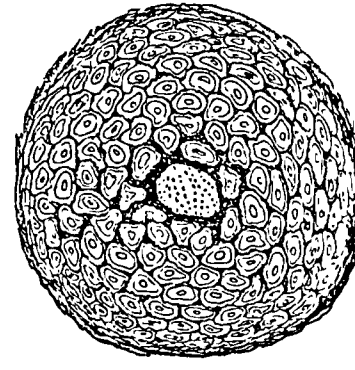
But that this peculiarity is also extended to a considerable part of the vegetable kingdom is a modern fact, the discovery of which we owe to the French naturalists Daubenton and Desfontaines. The path being thus opened, the inquiry has subsequently, and more particularly of late years, been much extended, especially by Professor Mohl, in an elaborate essay upon the anatomy of palms.

Mohl is of opinion that the first year's wood of an exogen is analogous in arrangement to that of an endogen, the woody bundles of each leaf curving upwards and outwards to the base of the leaf, and downwards and outwards towards the bark, crossing through those which have been previously developed.

Schleiden has subsequently pointed out that the real difference between the endogenous and exogenous stem depends on the nature of the vascular or woody tissue. This tissue is deposited in bundles, each of which bundles in endogenous and exogenous plants contains both young and old tissue. In endogenous plants these bundles cease growing at a certain period, and they are hence called definite progressive vascular bundles. In the exogens, the bundles continue growing; hence they are called indefinite progressive vascular bundles.

For convenience we may take the phenomena of growth in a palm-tree as typical of the endogenous structure. In the beginning the embryo of a palm consists of a cellular basis, in which a certain number of bundles of ligneous fibre are arranged circularly (fig. A.) down the radicle, deriving their origin from the plumule. Immediately subsequent to germination, and as soon as the rudimentary leaves of the plumule begin to lengthen, spiral vessels appear in their tissue in connection with the ligneous bundles; the latter increase in quantity as the plant advances in growth, shooting downwards through the cellular tissue, and keeping parallel with the outside of the

A



root. At the same time the cellular tissue increases in diameter to make room for the descending woody bundles. At last a young leaf is developed with a considerable number of such bundles proceeding from its base downwards, and, as its base passes all around the plumule, consequently passing downwards alike on all sides of the centre that it surrounds. Within this a second leaf gradually unfolds, the cellular tissue increasing horizontally at the same time. The woody bundles, however, soon cease to maintain any thing like a parallel direction, but curve outwards as they pass downwards, losing their extremities in the roots, or in the cellular integument on the outside of the first circle of bundles (fig. A). At the same time the second leaf pushes the first leaf a little from the centre towards the circumference of the plane or cone of growth; the consequence of which is that the woody bundles next the base of the first leaf are drawn a little outwards, and form descending axes which henceforwards are found at first to curve inwards towards the centre of the young stem, and afterwards outwards towards its circumference. In this manner leaf after leaf is developed, the horizontal cellular system enlarging all the time, and every successive leaf, as it forms at the growing point, emitting more woody bundles curving downwards and outwards, and consequently intersecting the older arcs at some place or other. The result of this is that the first formed leaf will have the upper end of the arcs which belong to it longest and much stretched outwardly, while the youngest will have the arcs the straightest; and the appearance produced in the stem will be that of a confused entanglement of woody bundles in the midst of a quantity of cellular tissue (fig. B). As the stem extends its cellular tissue longitudinally while this is going on, the woody arcs are consequently in proportion long, and in fact usually appear to the eye as if almost parallel, except here and there, where two arcs abruptly intersect each other. As in all cases the greater number of arcs curve outwards as they descend, and eventually break up their ends into a multitude of fine divisions next the circum-

ference, where they form a cortical integument, it will follow that the greater part of the woody matter of the stem will be collected near the circumference, while the centre is kept comparatively open, and will consist chiefly of cellular tissue; and when, as in many palms, the stem has a limited circumference, beyond which it is its specific nature not to distend, the density of the circumference must, it is obvious, be proportionably augmented.

B

In many of the larger kinds of endogens the stem increases principally by the development of a single terminal bud, a circumstance unknown in exogens, properly so called. In many however, as all grasses, the ordinary growth takes place by the full development of axillary buds in abundance.

In general there is so great a uniformity in the structure of an endogenous stem that the common cane or asparagus illustrate its peculiarities sufficiently.

Grasses are endogens with hollow stems strengthened by transverse plates at the nodes. This is seen in the bamboo, whose joints are used as cases to hold rolls, or in any of our indigenous species. In this case the deviation from habitual structure is owing to the circumference growing faster than the centre, the consequence of which is the tearing the latter into a fistular passage, except at the nodes, where the arcs of ligneous tissue originating in the leaves cross over from one side of the stem to the other, and by their entanglement and extensibility prevent the possibility of any rupture taking place. That this is so is proved by the fact that the stems of all grasses are solid, or nearly so, as long as they grow slowly; and that it is when the rapidity of their development is much accelerated that they assume their habitual fistular character. Independently of that circumstance their organization is quite normal.

The age of endogenous trees has been little studied. When the circumference of their stem is limited specifically, it is obvious that their lives will be limited also; and hence we find the longevity of palms inconsiderable when compared with that of exogenous trees. Two or three hundred years are estimated to form the extreme extent of life in a date palm and in many others.

But where, as in *Dracæna*, the degree to which the stem will grow in diameter is indefinite, the age seems, as in exogens, to be indefinite also; thus a famous dragon tree, *Dracæna Draco*, of Oratava in Teneriffe, was an object of great antiquity so long ago as A.D. 1402, and is still alive.

Important as the character furnished by the internal manner of growth of an endogen obviously is, it is much enhanced in value by its being found very generally accompanied by peculiarities of organization in other parts. The leaves have in almost all cases the veins placed in parallel lines, merely connected by transverse single or nearly single bars. Straight-veined foliage is therefore an exteral symptom of an endogenous mode of growth. When such an appearance is found in exogens it is always fallacious, and is found to be owing to the excessive size and peculiar direction of a few of the larger veins, and not to be a general character of all the venous system; as is sufficiently obvious in *Plantago lanceolata*, *Gentiana lutea*, and many more. The flowers too of endogens have in most cases their sepals, petals, and stamens corresponding with the number three, or clearly referrible to that type; and the pistil usually participates in the same peculiarity. Where such a proportion exists in exogens, it is usually confined to the sepals and petals by themselves, or to the pistil by itself, not extending to the other organs. In endogens it is almost universal in all the whorls of the flower, although sometimes obscured by the abortion, dislocation, or cohesion of particular parts, as happens in the whole of the extensive natural order of grasses.

The embryo of an endogen is, in its commonest state, a small undivided cylinder, which protrudes from within its substance a radicle from one end and a plumule from a little above the radicle; in other cases its embryo has a slit on one side, in the cavity of which the plumule reposes; or, finally, the embryo is a flat plate, as in grasses, with the plumule and radicle attached to its face near the base. In the latter case the flat plate is a solitary cotyledon, which, in the second instance, is folded together so as to give the embryo the appearance of being slit, and which in the first, or most habitual condition, is not only folded up, but united at its edges into a case entirely burying the plumule and cotyledon. Hence the embryo of an endogen is called monocotyledonous; a name that is really unexceptionable, notwithstanding the occasional appearance of a second rudimentary cotyledon, as occurs in common wheat.

It has already been stated that the radicle is protruded in germination from within the substance of the embryo; the base of the radicle is consequently surrounded by a minute collar formed of the edges of the aperture produced by the radicle upon its egress. For this reason exogens are called *endorhizal*.

Hence the great natural class of plants forming the subject of these remarks has five most important physiological peculiarities, by all which combined, or usually by each of which separately, the class may be characterized.

1. The wood is endogenous.
2. The leaves are straight-veined.

3. The organs of fructification are ternary.
4. The embryo is monocotyledonous.
5. The germination is endorhizal.

This explains why Endogens are also called *Monocotylédons* and *Endorhizæ*. They have moreover been called *Cryptocotyledoneæ* by Agardh, *Acroblastæ* by Reichenbach, and *Caulophytæ* by the school of Oken; but these names have been given upon mere hypothetical grounds, and are not of sufficient importance to deserve explanation in this place.

Endogens probably contain more plants contributing to the food of man, and fewer poisonous species in proportion to their whole number, than exogens. Grasses, with their floury albumen, form a large portion of this class, to which have to be added Palms yielding fruit, wine, sugar, sago, *Araceæ*, *Marantaceæ*, some *Amaryllidaceæ*, &c., producing arrow-root, the nutritious fruit of the plantains, the aromatic secretions of *Zingiberaceæ*, *Orchidaceæ* forming salep, and *Dioscoreaceæ*, producing yams. Among the deleterious species we have little worth notice beyond the poisonous mucilage in the bulbs of certain *Amaryllidaceæ*, and the acrid secretions of *Araceæ*.

The proportion that endogens bear to the whole vegetable kingdom is unknown. De Candolle computes the proportions of the three great classes into which plants used to be divided, thus:—

Exogens, or Dicotyledons . . .	636
Endogens, or Monocotyledons .	144
Acrogens, or Acotyledons . . .	220
	1000

But these numbers can only be regarded as loose approximations to the truth.

The classification of endogens is not a subject upon which there is any very great diversity of opinion among botanists. If the natural orders are sometimes not distinctly limited, they are, upon the whole, grouped much better than those of exogens; and although it may be expected, whenever more positive rules for classification than are yet known shall have been discovered, that great changes will be introduced into this part of systematic botany, yet we do not contemplate the probability of disturbing the limits of the natural orders themselves to any considerable extent.

Dr. Lindley divides endogens into six principal groups. Of these, four have the organization of the flowers *perfect*, there being in all cases a distinct calyx and corolla, and a regular consolidated cotyledon; and two are *imperfect*, the calyx and corolla being either altogether absent or in an incomplete condition, as in *Araceæ*, where scale-like bodies are all that represent the floral envelopes, or grasses, in which for calyx and corolla are substituted imbricated scales, and the cotyledon is very commonly rolled up without consolidation or actually flat.

The perfect groups consist, firstly, of plants whose leaves are those of exogens, having reticulated veins, a taper foot-stalk disarticulating from the stem, and the habit of *Menispermaceæ* or *Aristolochiaceæ*; these form the *Retose* group: secondly, of straight-veined plants, some of which have a superior and others an inferior ovary: all those with a superior ovary form the *Hypogynous* group. Those with an inferior ovary separate into two series, of which one has a distinct style and stamens (*Epigynosæ*), and the other those parts consolidated into a central column (*Gynandrosæ*).

The two groups of imperfect endogens are, the *Spadicose*, in which a coloured spatha is usually present, and the flowers either altogether naked or provided only with rudimentary scales (in these plants the cotyledon is rolled up, but its edges are not united, so that it appears to have a slit on one side); and the *Glumose*, where the flowers have imbricated scales representing the calyx, and frequently minute scales in lieu of a corolla; in these the cotyledon is very usually flat, with the double cone, formed by the plumule and the radicle, adhering to its face at the lower end.

ENDOSMOSE is the attraction through an animal or vegetable membrane of thin fluid by a denser fluid. Mons. Dutrochet found that if he filled the swimming bladder of a carp with thin mucilage and placed it in water, the bladder gained weight by attracting water through its sides: to this phenomenon he gave the name of *Endosmose*. He also found that if he filled the same bladder with water and placed it in thin mucilage, it lost weight, its contents being partially attracted through its sides into the surrounding mucilage: this counter phenomenon he named *Exosmose*. The same circumstances occur in the transmission of fluids through the tissue of plants. The parts of vegetables may be gorged with fluid by merely placing them in water, and may be emptied again by rendering the fluid in which they are placed more dense than that which they contain. This phenomenon takes place with considerable force. Water thickened with sugar in the proportion of 1 sugar to 2 water, is productive of a power of endosmose capable of sustaining a column of mercury of 127 inches, or the weight of 4½ atmospheres.

Dutrochet considers endosmose to be owing to what he calls intercapillary electricity, grounding his opinion partly upon the experiment of Porret, who found that when two liquids of different levels are separated by a membrane, they may be brought to a level by establishing an electrical current between the two, thus rendering the membrane permeable; and partly upon experiments of his own. But M. Poisson, on the contrary, has demonstrated that endosmose may be the result of capillary attraction joined to differences in the affinity of heterogeneous substances.

ENDOWMENT. [BENEFICE; USES, CHARITABLE.]

ENE'MATA. [CLYSTERS.]

ENFIELD. [MIDDLESEX.]

ENFIELD, WILLIAM, was born at Sudbury, in Suffolk, March 29, 1741, of humble but respectable parents. Having received his early education from Mr. Hextall, a dissenting minister of Sudbury, in his seventeenth year he was admitted to the Dissenting College at Daventry, then conducted by the Rev. Dr. Ashworth. Here he passed through the usual course of study of five years, and when he left was invited to the

office of minister to the congregation of Benn's Garden, in Liverpool. In 1767 he married Mary, the only daughter of Mr. Holland, draper in Liverpool, a connection which constituted his principal happiness for the rest of his life. In 1768 and 1770 he published two volumes of sermons, which were very favourably received.

He took his leave of Liverpool on being invited to the office of tutor in the belles lettres and resident conductor of the discipline at the academy of Warrington. These offices he accepted in conjunction with that of minister to the dissenting congregation of Warrington. The degree of doctor of laws was obtained from Edinburgh for him and others of the tutors by the trustees of the academy.

After the dissolution of the academy he accepted an invitation in 1785 from the Octagon dissenting congregation at Norwich. He resided at Norwich till his death, which took place November 3, 1797.

Dr. Enfield produced a great number of works, several of them educational, and many of them compilations. Among them were 'The Speaker,' 1774, a collection long employed in schools; Sermons; 'Institutes of Natural Philosophy,' 1783; a translation of Rossignol's 'Elements of Geometry,' 1783; and an abridgment of Brucker's 'History of Philosophy.' His last literary undertaking was a 'General Biographical Dictionary,' in conjunction with Dr. Arthur Aikin.

ENFILADE is the denomination applied to a fire of artillery or musketry when made in the direction of an enemy's line of troops, or to that which is made from any battery to the interior of an enemy's rampart or trench, and in the direction of its length. When an artillery fire is so employed by the besiegers of a fortress, the intention is to dismount the guns of the defenders, or to destroy the palisades or other obstacles behind a glacis, and to prevent the defenders from remaining at their parapets. When employed by the defenders of a fortress, it is intended to sweep any of the besiegers' trenches which may from necessity, or through the fault of the engineer, lie in a direction tending towards some part of the ramparts of the fortress. [RICOCHET.]

ENFRANCHISEMENT. [COPYHOLD.]

ENGADIN. [GRAUBÜNDTEN.]

ENGHIEN, DUC D'. [BONAPARTE, NAPOLEON.]

ENGINEERING (from the French word *engin*) is properly the art of constructing and using engines or machines; but the term is also applied to that of executing such works as are the objects of civil and military architecture, in which machinery is in general extensively employed.

A distinction has long been made between the civil and military engineer; and since every thing relating to the service of artillery is now confided to a particular corps, the duty of the military engineer may be said to comprehend the construction of fortifications, both permanent and temporary, including the trenches and batteries required in besieging places; also of barracks, magazines, and other works connected with warlike affairs.

The profession of the civil engineer comprehends the design and execution of every great work by which commerce and the practice of the useful arts may be facilitated. Thus, in creating or improving the communications of a country, he would be called upon to form a road through hills or over valleys or rivers, or to excavate a canal in connection with the waters by which it may be supplied, and to build the locks for retaining the surface at different levels, in different places, when the inequalities of the ground are considerable. He raises embankments to resist the encroachments of the sea or to reclaim the land which it may have covered, and dams to break the force of its waves at the mouths of natural harbours. He renders rivers navigable when their course is obstructed by rocks or banks; he forms docks or artificial harbours where ships may remain in security; he is required to penetrate by mines to vast depths for the purpose of seeking the mineral treasures contained within the bosom of the earth; and the formation of iron roads or railways is now a most important branch of the profession. Such are the occupations of this class of men; and it is necessary to observe that they frequently, in addition, practise the avocation of the machinist in executing the presses, mills, looms, and other great machines employed in the arts and manufactures; particularly in constructing steam-engines and the apparatus by which they are rendered available for giving motion to ships, carriages, or machinery.

In France the title of engineer is extended to persons who are employed for the public service in trigonometrical surveying in the interior of a country or on the coasts, and in the practice of naval architecture. The French have thus a corps of ingénieurs géographes, of ingénieurs d'hydrographie, and of ingénieurs de marine.

Of the national works executed by the ancients, and which are to be considered as properly falling within the province of the engineer, one of the first of which we have any intimation is the canal uniting the Red Sea and the Nile, which, according to Pliny, was begun by Sesostris, or, according to Herodotus, by Necos, the son of Psammetichus, and finished by Darius the First. The canal of Xerxes across the isthmus of the peninsula of Athos is another example of works of this kind. The introduction of arches in works of magnitude may be said to have constituted an epoch in the profession of the architectural engineer, since the idea of giving to blocks of stone a form which would enable them to sustain themselves in balanced rest by their mutual pressures, the discovery of the means of arranging them on a curve surface, and the determination of the magnitudes of the piers or abutments so that the lateral pressure of the vault might be adequately resisted, imply a higher degree of intellectual power than is exhibited in covering a space with a horizontal roof. The Cloaca Maxima [CLOACÆ] at Rome is probably the most ancient example in Europe of this scientific construction. The dome of the Pantheon, and the various arches of the Thermæ and of other public buildings, both at Rome and in the provinces, such as aqueducts and bridges, attest the grandeur of design, combined

with purposes of public utility, which characterised the architects who lived under the early emperors.

Previously to the commencement of the eighteenth century the most celebrated practical engineers were Brunelleschi, who built the dome of St. Mary at Florence; Peruzzi, San Gallo, and Michel Angelo, who executed that of St. Peter at Rome; San Michæli, the supposed inventor of the bastion system of fortification; and to these may be added Sir Christopher Wren, the architect of St. Paul's Cathedral in London.

But the extension of the manufactures of this country and the consequent augmentation both of its internal and foreign commerce, have, in more recent times, called forth all the energies of the people, who, in the works performed for facilitating the means of communicating between one place and another, and in the practice of the useful arts, have risen to an eminence which other nations have not been able to attain. Among the former may be mentioned the numerous canals and railways which intersect the country; the majestic bridges executed in stone over the Thames; in cast-iron over the Avon, the Thames, &c.; and those on the suspension principle at the Menai Strait, and across the Thames at Hammersmith and Hungerford Market. Among the men to whose talents in this branch of engineering the nation is indebted may be named Brindley, Smeaton, Jessop, Telford, the Rennies, Walker, and the Brunels.

The course of education by which a student may qualify himself to become an engineer, whether civil or military, must necessarily comprehend a greater extent both of the pure and physical sciences than would be required for a person who is to follow any other profession. It will be, perhaps for ever, a matter of opinion how much mathematics should enter into a school course of engineering; and there are, no doubt, some persons who contend that no more is required than would serve to compute the cost of materials and the wages of labour; this and the observation of existing examples being supposed sufficient to enable a man to enter upon the practice of the profession. It is not however with such knowledge only that an engineer is qualified to design an important work which it may be required to conduct under new and difficult circumstances. On the other hand, mere diligence in observing the results of practical operations will never raise a man to proficiency in art unless he is gifted with very extraordinary powers. A judicious combination of theory and practice is indispensable, and such a combination can only be made by a man in whom great natural talent is blended with all the aids that the sciences can afford.

Of the military engineer it may be said that a greater knowledge of the more minute details of construction is required than would suffice in the civil practitioner; because it may happen that the former is called upon to exercise his profession in some colony where workmen adequately skilled in the mechanical operations may be wanting. The accomplishment of the work may then become impossible, should the officer not be qualified to give the necessary instructions to those who are placed under his direction.

There is now near the metropolis a college for the education of young persons who are destined to act as civil engineers, where the science and practice of the profession are effectively taught; while the military seminaries at Woolwich, Sandhurst, and Addiscombe, afford corresponding advantages for those who have adopted the military service.

The institution of civil engineers which was formed at London in 1828 cannot fail, by the publication of its transactions, to be the means of greatly assisting such persons as may hereafter enter the profession; and, through them, of rendering service to society itself. Even established practitioners may occasionally derive benefit from the theoretical investigations and the practical details of construction which are the subjects of the papers read at the meetings of the members.

ENGLAND. The general description of England is given under the head of GREAT BRITAIN, and of the several counties; and the history is under the names of the kings.

ENGLAND, originally *Engla-land*, and *Engle-land*, means the land of the Angles or Engles. England under the Romans is described under BRITANNIA. The present article takes up the subject after the departure of the Romans.

According to the statement of Bede, which, repeated in the Saxon Chronicle, is the only distinct account we possess of the invaders from the Continent who effected the conquest of South Britain in the 5th and 6th centuries, they consisted principally of three nations or tribes, the Jutes, the Saxons, and the Angles. Bede also mentions Frisians as having been mixed with these three tribes, of which the Jutes and Angles appear to have been spread, in detached settlements, along the whole line of coast from the Schelde to the North Sea. The name of Saxons comprehended at that time, not merely one nation, but a great confederacy of nations, the territories occupied by which extended from the Baltic far into the interior of Germany. The Frisians who passed over into Britain were most probably the Strandfrisii, or inhabitants of the small district called the Lesser Friesland (Frisia Minor), lying opposite to the isle of Northstrand, on the western coast of Schleswig. It has been commonly assumed that the Teutonic tongue was first introduced into Britain in the 5th and 6th centuries; but Sir John Clerk, Pinkerton, Palgrave, and other writers, incline to the opinion that the Belgic tribes, who occupied parts of South Britain before the arrival of the Romans, had already introduced the Teutonic language, of which the Saxon was one of many branches.

The first of the Germanic invaders that arrived after the departure of the Romans are described as having been a body of Jutes, under two leaders named Hengist and Horsa. They arrived A.D. 449 at Ebbsfleet in Kent. They were followed in A.D. 477 by a body of Saxons under Ella, who made their descent on the coast of Sussex. The next leader that arrived was Cerdic, with another colony of Saxons, in A.D. 495. The Saxon

immigrants appear to have eventually occupied Sussex, Essex, Middlesex, the south part of Hertfordshire, Surrey, Hampshire (with the exception of the coast opposite to the Isle of Wight), Berkshire, Wiltshire, Dorsetshire, Somersetshire, Devonshire, and part of Cornwall. It was not till the year 527 that the first Angles arrived. From that time they made a succession of descents under various petty chiefs, whose names have not been preserved, upon the coasts of Suffolk and Norfolk. In 547 however a much more numerous body of them than had yet appeared landed under the conduct of Ida on the coast between the Tweed and the Forth, and eventually established themselves in the country to the north of the Humber. The Angles obtained possession of the whole of what is now called England, with the exception of the parts already mentioned as occupied by the Jutes and Saxons. They also extended their settlements over a great part of the south of Scotland.

A heptarchy, or group of seven kingdoms, was gradually formed by successive bodies of invaders. These seven were the following :—

1. Kent, consisting of the present county of that name, founded by Hengist and Horsa. Kent subsisted as an independent state till its conquest by Cenwulf, king of Mercia, in 796. In 823 it was finally annexed to Wessex by Egbert; but for at least a century after that date it is still mentioned as a separate though subordinate kingdom.

2. Sussex, consisting of the present county of that name, founded by Ella, whose followers were Saxons, A.D. 491. In A.D. 686 it was conquered by Ceadwalla, king of Wessex, and appears to have remained ever after in subjection either to that state or to Mercia. In 828 it finally submitted to Egbert.

3. Wessex, including Surrey, Hants with the Isle of Wight, Berks, Wilts, Dorset, Somerset, Devon, and part of Cornwall, founded by Cerdic and his son Cynric, whose followers were Saxons, A.D. 519. In the reign of Egbert (A.D. 800-836) Wessex attained a supremacy over the other states, which it never lost afterwards.

4. Essex, including the present counties of Essex and Middlesex, and the southern part of Hertfordshire, supposed to have been founded by Æscwin, or Ercenwine, whose followers were Saxons, A.D. 527. It became subject to Mercia in the course of the 7th century, and in 823 it finally submitted to Egbert of Wessex.

5. Northumbria, consisting of the counties of Cumberland, Durham, Westmoreland, York, Lancaster, Northumberland, and the south-east of Scotland, was founded by Ida in A.D. 547, and Ella in A.D. 560, whose followers were Angles, and whose two states, called Bernicia and Deira, coalesced to form this kingdom. From the middle of the 8th century the history of Northumbria consists of little else than a detail of civil dissensions arising from the claims of rival competitors for the throne. The Northumbrians made a formal submission to Egbert of Wessex in 829. In 867 the country was conquered by the Danes; in 924 it acknowledged the supremacy of Edward the Elder; but it was not till some time after the Norman conquest that the territories came to be considered as strictly included within the realm of England.

6. East Anglia, including Norfolk, Suffolk, Cambridgeshire, and part of Bedfordshire, founded by Uffa, whose followers were Angles, A.D. 571. The East Angles placed themselves under the sovereignty of Egbert of Wessex about the year 823. They were under Danish rule from 883 till 925, when Athelstane made them subjects of the English crown..

7. Mercia, including the counties of Chester, Derby, Nottingham, Lincoln, Shropshire, Stafford, Leicester, Rutland, Northampton, Huntingdon, Hereford, Worcester, Warwick, Gloucester, Oxford, Buckingham, and parts of Hertford and Bedford, said to have been founded by Crida, whose followers were Angles, A.D. 585. About the middle of the 7th century Mercia was conquered by Oswy, king of Northumbria; but after a few years it recovered its independence; and before the end of the next century it had reduced to subjection both the neighbouring states of East Anglia and Kent. It was subjugated about the year 825 by Egbert of Wessex, and never after regained its independence.

Besides these seven states, various small districts appear, at different times, to have preserved an all but nominal independence in the midst of the larger states, to some one or other of which they were severally considered as annexed. Such were the Isle of Wight, the Suthridge or Southern Kingdom, now Surrey, &c. These states never combined so as to form any kind of confederacy; but the most successful among their kings often assumed the title of Bretwalda, or Emperor of Britain. The following is the succession of the Bretwaldas as given by Bede :—1. Ella, or Aelli, who was king of Sussex from 491 to 518; 2. Coelin, or Ceawlin, of Wessex, from 568 to 589; 3. Ethilbert, or Aedilberct, of Kent, from 589 to 616; 4. Redwald, king of East Anglia, from 616 to 624; 5. Edwin, of Northumbria, from 624 to 633; 6. Oswald, of Northumbria, from 635 to 642; 7. Oswy, of Northumbria, from 642 to 670. Egbert of Wessex is reckoned the eighth Bretwalda, and is considered to have attained the dignity in the year 827. Upon the whole, the title of Bretwalda cannot well be regarded as any thing more than an empty assumption of some of the Saxon kings, or an epithet of distinction bestowed upon them by the flattery of the chroniclers. It certainly carried with it no real or legal authority.

Egbert of Wessex, although not strictly entitled to be called the first king of all England, certainly laid the foundation of what afterwards became the English monarchy. The royal house of Wessex never lost the ascendancy which he acquired for it so long as the Anglo-Saxons remained masters of England. The following are the dates of accession of the sovereigns from that time :—

Kings of Wessex.

A.D. 800. Egbert, acknowledged as Bretwalda from A.D. 827.

836. Ethelwulf; with Athelstane till 852,

and then Ethelbert, in Kent, Essex, and Sussex.

A.D. 855. Ethelbald; with Ethelwulf (the preceding king) as supreme till 856, and Ethelbert as subordinate, in Kent, Essex, and Sussex.

860. Ethelbert.
866. Ethered, or Ethelred I.
871. Alfred the Great.
901. Edward the Elder.

Kings of all England, of the House of Wessex.

925. Athelstane.
941. Edmund I.
946. Edred.
955. Edwy.
958. Edgar.
975. Edward the Martyr.
978. Ethelred the Unready.
1016. Edmund Ironside.

Danish Kings of England.

1017. Canute the Great.
1035. Hardicanute, with Harold Harefoot, in Mercia and Northumbria.
1037. Harold Harefoot.
1040. Hardicanute restored.

House of Wessex restored.

1042. Edward the Confessor.

Line of the Earls of Kent, &c.

1066. Harold II.

Norman Line.

1066. William the Conqueror.
1037. William Rufus.
1100. Henry I.
1135. Stephen.

Line of Plantagenet.

1154.	Henry II.	1272.	Edward I.
1189.	Richard I.	1307.	Edward II.
1199.	John.	1327.	Edward III.
1216.	Henry III.	1377.	Richard II.

House of Lancaster.

1399.	Henry IV.	1422.	Henry VI.
1413.	Henry V.		

House of York.

1461.	Edward IV.	1483.	Richard III.
1483.	Edward V.		

House of Tudor.

1485.	Henry VII.	1553.	Mary.
1509.	Henry VIII.	1558.	Elizabeth.
1547.	Edward VI.		

House of Stuart.

1603.	James I.	1625.	Charles I.

Commonwealth, from the Execution of Charles I. in 1649.

1653. Oliver Cromwell, Protector.
1660. Richard Cromwell, do.

House of Stuart restored.

1660.	Charles II.	1685.	James II.

House of Orange.

1689. William III., with Mary II., till 1695.

House of Stuart restored.

1702. Anne.

House of Hanover.

1714.	George I.	1820.	George IV.
1727.	George II.	1830.	William IV.
1760.	George III.	1837.	Victoria.

ENGLAND, NEW, is a name which, in the 17th and 18th centuries, was applied to the English settlements on the eastern coast of North America, north of 41° N. lat. But as, in the progress of colonization, the British population increased, the country was divided into several provinces, which, at the time when these countries acquired their independence, were formed into so many states. The provinces formerly comprehended under the name of New England were the present states of New Hampshire, Massachusets, Rhode Island, and Connecticut; but the states of Maine and Vermont, which, before the revolution, did not form provinces, were also considered as portions of New England.

ENGLISH CHANNEL, called by the French *La Manche*, is that narrow sea which separates the southern shores of England from the northern shores of France. On the W. it opens into the Atlantic Ocean by a wide mouth, between the Land's End and the French island of Ushant (*Ouessant*), where it is about 100 English miles across. On the E. it is united to the North Sea by the Strait of Dover. This Strait, which must be considered as a part of the Channel, is formed on the English side by the shore between the South Foreland and Folkstone, and on the French side by that between the harbour of Calais and Cape Grisnez, and at its narrowest point between Folkstone and Cape Grisnez is only about 20 miles across, and at other points very little more. West of the strait of Dover, the channel rapidly increases in width, and between Brighton and Hâvre is more than 90 miles across. Farther W. however it is narrowed by the peninsula of Cotentin, which projects from the French coast into the channel. Between the Isle of Wight and the peninsula of Cotentin the distance is hardly 70 miles. West of the peninsula is the widest part of the channel, which between St. Alban's Head in Dorsetshire and the harbour of St. Malo is nearly 140 miles across. The remainder of the channel to its junction with the Atlantic is between 100 and 110 miles wide.

ENGLISH DRAMA. [GREAT BRITAIN—*Literature.*]

ENGRAVING, the art of executing designs by incision upon plates of copper, steel, or other substance, for the purpose of obtaining therefrom impressions or prints upon paper.

From the book of Exodus we learn that when Moses had liberated the Jews from Egyptian bondage, he was commanded to 'make a plate of pure gold, and grave upon it, like the engravings of a signet, holiness to the Lord.' He was also commanded 'to take two onyx stones, and grave on them the names of the children of Israel according to their birth, with the work of an engraver on stone, like the engravings of a signet.' Both these passages distinctly imply the practice of gem and seal engraving, and also of engraving on metal plates. From Herodotus (v. 49) we learn that one of the earliest uses to which engraving was applied among the Greeks was the delineation of maps on metal plates. Some of the Egyptian hieroglyphic inscriptions are evidently executed with instruments similar to those now in use. Some of the lines narrowing down-

wards have clearly been cut with the lozenge-shaped graver now chiefly used; but other lines, being of the same width through their whole depth, must have been produced with that species of graver called a scooper, still used for effecting broad incisions. It is believed that some of the relics of Etruscan art in the British Museum are of as high antiquity as any existing specimens of engraving. In India, also, the art of engraving on plates of copper appears to have been practised long before the Christian æra. It would appear that it was there customary to ratify grants of land by deeds of transfer actually engraven on plates of copper, as we now write them on skins of parchment.

In England, before the Conquest, many of the buckles, clasps, rings, and military accoutrements were engraved. In the Museum of Oxford is preserved a finely engraved gold jewel, which belonged to Alfred the Great. About the 12th century was introduced the art of engraving sepulchral brasses. They are executed entirely with the graver, and in the same manner that a copper-plate is now engraved.

We now approach the period when the invention of *printing* gave to engraving a new direction. The first prints were obtained from engraved wood blocks. The earliest print with a date attached to it is one known as the St. Christopher, which is from a wood block, and dated 1423; but no impression from an engraved *plate* has been found with a date anterior to 1461. The art of engraving on metal plates for taking impressions on paper was first practised by Tommaso Fineguerra, a Florentine goldsmith, about the year 1460. Some writers have claimed the invention for Germany; but it is generally considered that the art was first practised in Italy, and had its origin in the workshops of the goldsmiths. Many of these goldsmiths were *niellatori*, or workers in *niello*—a mode of ornamental engraving usually performed on silver plates—the design engraved on which was afterwards filled in with a black composition.

An accident is said to have suggested to Fineguerra the possibility of taking an impression from the engraved design with ink on moistened paper. When once established, the new art was eagerly taken up by Baldini, Botticelli, Pollajuoli, and Mantegna; and in Germany by Martin Schoen, Israel van Mecheln, Leydenwurf, and Wolgemut. The first *book* printed at *Rome* (an edition of Ptolemy's Geography) was illustrated by the first *plate engravings*, twenty-seven in number, which were maps, and were executed there by two Germans, Sweynheym and Buckink. This work is dated 1478, but was commenced in 1472. Another early work was an edition of Dante's 'Inferno,' published at Florence in 1481, and embellished with engravings by Baccio Baldini, after the designs of Botticelli.

One of the best engravers in Italy in the early part of the 16th century was Raimondi, who studied under Francia and Raffaello. His great merit lay in the correctness and beauty of his outline. He engraved many of Raffaello's pictures, which he copied with great truth, although defective in respect to light and shade. He was succeeded in

Italy by Agostino de Musis, Marc de Ravenna, Caraglio, Giulio Bonasoni, and Enea Vico, all pupils of Raimondi; Georgi Ghisi of Mantua, and his relatives Diana and Adam Ghisi, Cornelius Cort, &c. The principal painters who have practised engraving in Italy are Agostino Carracci, Stefano della Bella, Spagnoletto, Guercino, Salvator Rosa, Claude Lorraine, Swaneveldt, Canaletto, Piranesi, &c.

In Germany engraving made more rapid strides towards excellence, in the mechanical parts of it; and at the commencement of the 16th century appeared Albert Dürer, a man whose universality of talent extended the boundaries of every department of art, and carried all to a degree of perfection previously unknown in that country. He had great command of the graver, and carried his plates to a much higher degree of finish than his Italian contemporaries. He is also believed to have invented the art of etching by corrosion: three of his specimens are dated 1515, 1516, and 1518 respectively. On examining the etchings of Albert Dürer, we see that they have all been corroded at one biting in; which sufficiently explains their monotonous appearance, and *proves* that 'stopping out' was not then understood. The principal German engravers, after Albert Dürer, are Aldegraver, the Behams, Altdorfer, Bink, Penz, Solis, &c.

Lucas Jacobs, best known by the name of Lucas van Leyden, was the father of the Dutch and Flemish schools, and the contemporary and friend of Albert Dürer. After Van Leyden the art was maintained in the Low Countries by the Wierinxes, the Sadelers, whose works are multifarious, and embrace every class of subject; the elder and younger Jode, Cornelius, Theodore, and Philip Galle, Abraham and Cornelius Bloemart, Goltzius, Sprangher, Müller, Lucas Killian, Matham, Saenredam, and the two brothers Bolswert. Many of these introduced improvements in the art. To mention the artists of this school from whose hands we have etchings would be to name nearly all the most eminent painters belonging to it: Rembrandt, Berghem, Cuyp, Karel du Jardin, Paul Potter, Ruysdael, Ostade, Waterloo, Adrian Vandervelde, with many others.

In France engraving has been practised with pre-eminent success in the departments of history and portraiture. The celebrity of the school dates from the time of Louis XIV. The family of the Audrans produced six eminent engravers; but of those the most distinguished was Gerard Audran, who was the first engraver who successfully united, to any extent, the use of the graver and the etching point. Gerard Edelinck, although born at Antwerp, may be fairly considered of the French school, and was an engraver of the highest order. In portrait Nanteuil is no less celebrated than his contemporaries. The Drevets, John Louis Roulett, Le Clerc, Simoneau, Chereau, Cochin, Dupuis, Beauvais, Balechou, Le Bas, Jonn George Wille, are among the best of the French engravers.

The English school of engraving dates only from about the middle of the eighteenth century, previous to which those who practised the art in England were chiefly foreigners.

Hogarth engraved many of his own designs. Francis Vivares introduced the favourite art of landscape etching; he, Woollet, and Browne, produced some of the finest landscape engravings extant. Sir Robert Strange excelled in portrait engraving. Mezzotinto engraving, although not strictly born among us, has been in no other country practised with a degree of success at all approaching that attained by M'Ardell, Earlom, Smith, Valentine Green, and others. Bartolozzi, Ryland, Sharpe, Paul Sandby, Middiman, Milton, Fitler, and Raimbach, are among the most eminent of deceased engravers.

A modern engraving is usually the result of two processes, namely, of direct incision with the graver or the dry point, and of etching by corrosion. The principal instrument is the *graver*, or *burin*, which is usually of the form of a quadrangular prism, fitted into a short handle. The square graver is used in cutting broad lines, and the lozenge-shaped for more delicate ones. In making the incision, it is pushed forward in the direction of the line required, being held by the handle at an angle very slightly inclined to the plane of the copper. An instrument called a *scraper* is required to scrape off the barb or burr which is formed by the action of the graver and dry point. A roll of cloth dipped in oil, called the *rubber*, is also used to make the surface smooth. The *burnisher* is used to polish the plate and to erase any scratches which it may accidentally receive, and also to make lighter any part of the work which may have been made too dark. *Etching-points* or *needles* are nearly similar in appearance to sewing-needles, but fixed into handles four or five inches long; some are made of an oval form, to produce broader lines. The *dry point* does not, like the graver, cut the copper clean out, but throws it up on each side of the line produced by its progress through the metal.

Etching is the superaddition of the chemical process of corrosion to drawing, when performed on a plate of copper over which a substance called *etching-ground* is laid. This etching-ground is a substance composed of wax, asphaltum, gum mastic, resin, &c., incorporated by melting over a fire, and capable of resisting the action of aquafortis; it is applied by the aid of heat, so as to lie in a thin stratum on the copper. To transfer the design to the copper, an outline is made with a black-lead pencil on a piece of paper, and laid with the face downwards on the etching-ground; the whole is then passed through a rolling-press, the effect of which is to transfer an impression of the outline on to the prepared ground. After this the design is completed with the etching needles, which remove the ground from the copper wherever they pass, and expose it to the action of the acid during the process of biting in. The aquafortis continues on the plate until the fainter parts are supposed to be corroded sufficiently deep; after which it is poured off, the plate washed with water, and left to dry. The parts which are bitten-in enough are now to be covered with what is called *stopping-ground*, which is a mixture of lamp-black and Venice turpentine; this is applied with a camel-hair pencil, and allowed to dry. After this the acid is again poured on, and this process of *stopping-out* and *biting-in* is repeated till the darkest parts are sufficiently corroded.

Engraving in stipple is performed with the graver, which is so managed as to produce the tints by small dots, rather than by lines, as in the ordinary method.

Engraving and *etching on steel* are performed in the same manner as on copper, for which steel has of late years been often substituted on account of its yielding a greater number of perfect impressions, owing to its superior hardness.

Medallic engraving is a species of etching introduced by M. Collas and Mr. Bate. By this mode very beautiful representations are obtained of medals, &c., by means of a machine of peculiar construction.

Etching on glass is performed by laying on the glass a ground of bees' wax, and drawing the design thereon with the needle, as in etching upon copper. Sulphuric acid is then poured on, and fluor spar, or fluoric acid, sprinkled on it. After four or five hours it is taken off, and the work cleaned with oil of turpentine.

[AQUATINTA ENGRAVING; LITHOGRAPHY; MEZZOTINT; VOLTAGRAPHY.]

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ENGROSSING. [FORESTALLING.]

ENHARMONIC, a scale of musical notes in which quarter-tones are admitted. It was used in ancient Greek music, but is almost abandoned in modern times.

In strictness, C♯ is not the same sound as D♭, but in modern keyed instruments one note is made to serve for both. When provision is made for both (in some few instruments), the arrangement is termed *Enharmonic*.

ENIGMA. [ÆNIGMA.]

ENLARGEMENT OF OBJECTS. The mind forms a judgment of the apparent magnitudes of visible objects chiefly from the angles subtended at the eye by their principal linear dimensions; but many circumstances render that judgment erroneous, and create illusions respecting apparent magnitude of which it is important to be aware.

When objects are near a spectator the forms and colours of their parts usually afford distinct perceptions of them; and since, in proportion as the objects are more remote, the quantity of light reflected from them to the eye diminishes, the perceptions both of outline and colour diminish in intensity. Hence, indistinctness of form and colour being in the mind associated with remoteness, when from any cause an object appears indistinct, and at the same time to subtend at the eye an angle equal to that under which it is usually seen at a given distance, the imagined remoteness gives rise to a perception of increased magnitude.

A series of objects beyond one another give indications of distance, and this a spectator may obtain on looking along nearly level ground towards the horizon; while the absence of intermediate objects between him and the part of the heavens above his head will lead him to imagine that the summit of the celestial vault is comparatively near him. Thus the apparent figure of the

vault is a segment less than a hemisphere; and if we form our estimate of the magnitudes of the sun and moon, or of the distances between stars, by their projections upon the oblique face of the sky, it is evident that the projected disks or spaces will appear greater, near the horizon, than if they were conceived to be projected on a plane perpendicular to the latter. This is conceived to be, in part, the cause of the apparent enlargement of the sun and moon, and of the distances between stars when viewed near the horizon. The visible magnitudes of luminous objects, as the sun, moon, and planets, are, at all times, greater than is consistent with their known distances; and the circumstance is ascribed to the unsteadiness of the eye.

ENLISTMENT, an engagement to serve as a private soldier either during an unlimited period or for a certain number of years, on receipt of a sum of money. Enlistment differs from enrolment, inasmuch as it is a voluntary act, whereas the latter is, under some circumstances, rendered compulsory: as in the case of men who are selected by ballot for the militia in this country, or by the conscription, for military service generally, on the continent.

The profession of a soldier can never possess such advantages as might induce an industrious man who can obtain a sustenance in another way to embrace it; and it is to be regretted that too frequently those who enter the service are thoughtless young men of indolent habits or desperate fortunes. Some attention however to the character of a person offering himself for enlistment is necessary if it be desired to render the service honourable; for it is found that idle and dissipated men are with difficulty brought to submit to the necessary restraints of discipline; their frequent desertions entail heavy losses on the government, and they often corrupt those who are compelled to associate with them.

By the 34th clause of the Mutiny Act, every person who has received enlisting-money from any military man employed in the recruiting service is considered as having enlisted; and within four days from the time of receiving the money, the recruit, attended by any person employed as above-said, is to appear before a magistrate (not being a military man), when, if he declare that he has voluntarily enlisted, the magistrate is to administer to him an oath of allegiance, of which a form is given in a schedule to the act.

But as the young and simple have been sometimes inveigled by illusory promises, or persuaded while deprived of judgment by intoxication, to enlist, if a recruit, on reflection, wish to withdraw from the engagement into which he may have been surprised, it is provided by the 35th clause of the Mutiny Act, that when taken before the magistrate as above he shall be at liberty to declare his dissent from such enlistment; on making which declaration and returning the enlisting-money, with 20*s.* in addition for the charges which may have been incurred on his account, he shall be forthwith discharged.

If a recruit, after receiving the enlistment-money, and after notice of having enlisted has been left at his place of abode, shall abscond, he may be apprehended and punished as a deserter, or for being absent without leave; and if it be proved that the recruit concealed the fact of his being a discharged soldier, he may be sentenced to suffer punishment as a rogue or vagabond.

An apprentice who shall enlist, denying himself to be such, is deemed guilty of obtaining money under false pretences; and, after the expiration of his apprenticeship, if he shall not deliver himself up to some officer authorized to receive recruits, he may be taken as a deserter.

The present practice is to enlist either for an unlimited period, as during the continuance of a war, or for certain defined numbers of years, which vary in the different classes of troops. For the infantry the period is seven years; for the cavalry ten years; and for the artillery twelve years; but if the person enlisting be under eighteen years of age, the difference between his age and eighteen years is added to each period. The enlistments for the Honourable East India Company's service are also for unlimited periods, or for twelve years, provided the recruit be not less than eighteen years of age.

By an act passed in 1835 a man is allowed to enlist in the navy for a period not exceeding five years, after which he is entitled to his discharge, and to be sent home, if abroad, unless the commanding officer should conceive his departure to be detrimental to the service. Such officer is then empowered to detain the man six months longer, or until the emergency shall cease, in which case the man is entitled, during such extra service, to receive an increase of pay amounting to one-fourth of that which he receives according to his rating.

ENNIS. [CLARE.]
ENNISCORTHY. [WEXFORD.]
ENNISKILLEN. [FERMANAGH.]
ENNISTIMON. [CLARE.]

E'NNIUS, QUINTUS, the old epic poet of Rome, was born at Rudiæ, in Calabria, in 239 B.C., two years after the termination of the first Punic war. He was a Greek by birth, but his original name is not known: that of Ennius is a Latin form, and was probably adopted by him when he became a Roman citizen. In B.C. 204 he was serving as a Roman centurion in Sardinia, where his abilities attracted the notice of Cato, who was quæstor under the first Scipio Africanus. When Cato left the island, the poet accompanied him to Rome, and fixed his residence on the Aventine. His abilities won for him the friendship of the first men of Rome, and he was largely instrumental in introducing letters among them. Cato learned Greek from him. Scipio Africanus found in him a companion in peace and the herald of his glories in war. His social qualities led him into intemperance, but he completed his seventieth year, and to the last devoted himself to the muses. He died B.C. 169, and was buried in the Cornelian sepulchre, on the Appian road, where his statue appeared with those of Publius and Lucius Scipio, even in the age of Livy. Nævius, the first poet of Rome, and Livius Andronicus were his predecessors by a few years. The tragic poet Pa-

cuvius was his sister's son. Plautus was his contemporary, and the comic writer Cæcilius his companion in arms. The great work of Ennius, called 'Annals,' was an historical epic in eighteen books, in hexameter verse, a form of metre which he is said to have introduced into Roman literature. This work traced the history of Rome from the mythical age of Æneas to his own time. He gave the Romans a translation, a very free one, of the Euménides of Æschylus, the Medea, Iphigenía in Aulis, and Hecuba of Euripides, and the Ajax of Sophocles, besidés nineteen from other Greek poets. He also wrote comedies, and other works. Of all these works there are only fragments collected from Cicero and other writers. The work entitled Annals was for a long time the national epic of Roman literature, and Virgil has borrowed freely from it. The best edition of Ennius is by Hesselius, 4to., Amsterdam, 1707.

ENOCH, *the Book of*, is one of the Hebrew Scriptures which, with the Book of Wisdom, those of Tobit, Judith, Maccabees, and several others, were designated Apocryphal. During the apostolic age the Book of Enoch was commonly read by Jews and Christians. St. Jude, in his Catholic Epistle, cites it as the work of a divine prophet ('Enoch the seventh from Adam prophesied, saying,' &c., v. 14, 15); so Tertullian ('De Idolatria') refers it to the inspiration of the Holy Spirit: however, in another treatise ('De Cultu Fœminarum') he states that by some it was not received. Irenæus, Jerome, and other Fathers, respectfully notice it, though not as canonical; and Origen ('contra Celsum,' lib. v.) observes that, in his time, it was not of great authority in the churches. It was extant among Christian writers until the 8th century, when it appears to have been lost. Several fragments however remained, which, with a few citations collected from the Fathers and succeeding writers, supplied the only data for the critical discussions of learned divines during several centuries.

At the end of the 18th century Bruce brought from Abyssinia three complete and beautiful copies of the Book of Enoch, in the Ethiopic language, one of which he presented to the Bibliothèque du Roi at Paris, and another to the Bodleian Library at Oxford. Of this last, Dr. Lawrence, professor of Hebrew at Oxford, published in 1826 an English version of the whole, entitled 'The Book of Enoch the Prophet, supposed for ages to be lost; translated from an Ethiopic MS. by the Rev. Richard Lawrence, LL.D., Archbishop of Cashel.' That this book is identical with that which, in the primitive ages of Christianity, was cited by Jude and the Fathers, is considered by Dr. Lawrence to be completely evident. It is supposed by those who reject the supposition of its being the antediluvian production of Enoch himself that it was anonymously written in Hebrew, shortly before the commencement of the Christian æra.

ENROLMENT is the registering, recording, or entering a deed, judgment, recognizance, acknowledgment, &c., in the Chancery, or any other of the superior or inferior courts being a court of record. The enrolling of a deed makes it a deed recorded. Various statutes have directed instruments to be enrolled, as the 27th Henry VIII. c. 16, relating to deeds of bargain and sale of freehold land; and the 53rd George III. c. 141, relating to memorials of annuities, &c. All deeds also relating to property in the counties of York and Middlesex are registered in the register-offices there established by statute. Wills affecting lands should, by the direction of the statutes, be registered both in Middlesex and Yorkshire, and also at Kingston-upon-Hull.

ENS, PROVINCES OF THE, or *Upper Austria* and *Lower Austria*, constitute the Archduchy of Austria, the nucleus of the Austrian dominions. [AUSTRIA, EMPIRE OF.] These Provinces have an area of about 14,881 square miles, 52 towns, and above 12,000 villages.

The province of the *Lower Ens*, or *Lower Austria*, lies nearly in the centre of the Austrian dominions, on both sides of the Danube, between 47° 26′ and 49° 0′ N. lat., and 14° 26′ and 17° 1′ E. long. The subdivisions are as under:—

Circles, &c.	Chief Towns.	Pop.
Vienna (capitanate) .	Vienna .	333,000
Lower Wiener Wald .	Traiskirchen .	1,000
Upper Wiener Wald .	St. Pölten .	4,400
Lower Manhartsberg .	Korneuburg .	1,900
Upper Manhartsberg .	Krems . .	3,800

The Lower Ens is walled in both on the N. and S. by ranges of mountains. A portion of the Noric Alps spreads its branches over nearly the whole of the country S. of the Danube. Its most elevated points are the Alpengipfel, the Grosser Riese, the Goeller, and the Wecksel, which range from 6000 to 8000 feet in height. The Manhart Mountains, a succession of wooded heights called the Wiener Wald, and the Cetian Mountains, constitute with the portion of the Noric Alps, one-third of the whole surface of the province.

The fine valley of the Danube extends through the province from W. to E. for about 156 miles. The tributaries of the Danube, so far as the Lower Ens is concerned, are of no great length or volume of water. On the right bank are the Ens, Ips, Erlaf, Billach, Trasen or Traisen, Schwechat, great Fischa, and Leitha: on the left bank are the Krems, the March, and the Kamp. [DANUBE.] The streams which are not tributary to the Danube are mere rivulets. There are two canals: the Donau Canal close to Vienna, and a canal from Vienna to Wiener Neustadt. The largest lake is the Erlaf or Zellersee, which is about 4998 feet long, 1890 broad, and 600 deep. Near the Mittersee there is a beautiful waterfall 200 feet high, and close to it is a spot called the Brüllender Stier (roaring bull), whence the roar of a subterraneous cascade is heard. There are mineral waters of repute in many parts of the province.

The varied character of the surface occasions considerable difference of climate; and the weather in any one spot varies greatly. The soil differs much in productiveness. The richest tracts are in the centre of the province, but the Lower Ens does not rank among the more productive provinces of the Empire. It is a manufacturing rather than an agricultural province.

The inhabitants of this province (in 1840, about 1,409,600) are of German descent. The majority are Roman Catholics, and the minority Protestants, Greeks, and Jews, with a few Armenians. In the eastern and north-eastern districts there are many Sclavonians, here denominated Croats.

Nearly one half of the province is devoted to the production of grain, vegetables, and wine; and of this about 1,900,000 acres are under the plough: yet, in spite of good husbandry, the soil and climate are not very favourable to corn. The quantity of meadow-land is estimated at about 550,000 acres; the pastures at about 382,000; and the woods and forests occupy about 1,228,000. Peas, beans, potatoes, hemp, flax, saffron, and abundance of fruits and vegetables are cultivated. The vineyards occupy about 112,000 acres, and on an average yield about 31,000,000 gallons annually: some of the wine is of fine quality. The woods and forests have suffered so much from neglect that they do not suffice for the consumption of the country. The most extensive, which lie in the Wiener Wald, are chiefly composed of the beech, oak, maple, linden, elm, alder, pine, and fir.

The rearing of horned cattle has never recovered from the blow which it received during the repeated invasions of the French armies. The stock is very small. The sheep are estimated at about half a million, which yield two million pounds of wool annually. Goats and swine are not bred in great numbers. Poultry is fed on a large scale for the Vienna market. Some honey and wax are made: the stock of game is much diminished.

The mines are not of any great importance; but there is a large supply of marble, freestone, gypsum, lime, mill-stone, granite, slate, alum, potter's clay, quartz, and porphyry. Coals are raised in the south and in some other parts. A good deal of manufacturing is carried on. Flax, hemp, wool, cotton, and silk, are spun and woven, and there are large calico-printing works. Laces, ironware, cutlery, tools, copperware, brasswork, buttons, jewellery, trinkets, articles of wood, leather, glass, mirrors, porcelain, earthenware, paper, musical instruments, soap, &c., form so many additional branches of industry.

The Lower Ens has a considerable trade with the neighbouring countries and foreign parts, by means of its communications by land with the Adriatic, Germany, Poland, &c., and by the Danube with Hungary, Turkey, and the East.

The province of the *Upper Ens*, or *Upper Austria*, forms the western part of the Archduchy, and is situated on both banks of the Danube, between 46° 57′ and 48° 46′ N. lat. It comprehends the duchy of Salzburg, which was incorporated with it in the year 1816. The subdivisions are as under:—

Circles.	Chief Towns.	Pop.
Mühl	Linz	23,500
Inn	Ried	2,344
Hausruck	Wels	4,000
Traun	Steyer	10,100
Salzburg	Salzburg	13,300

The Upper Ens is a mountainous country: the parts south of the Danube contain the most elevated regions in the Austrian dominions, and those north of it are intersected by lower ranges which are offsets of the great Bohemian forest range. There are five summits, of the Rhætian and Noric Alps, which exceed 10,000 feet in height. The only level country in the province is the immediate borders of the Danube.

Among the numerous streams there are five navigable rivers: the Danube, the Inn, the Saal, the Ens, and the Traun: those of smaller importance include the Ayer, the Salza, the Saal, the Lammer, and the Rana. The province abounds in lakes; of which the chief are the Traun or Gmunder See, the Halstätter See, the Atter or Kammer See, and the Matt or Mond See. None of these are above 12 miles in length. Swamps and morasses of considerable extent occur in many parts. Mineral springs occur at Gastein and St. Wolfgang.

The climate is much colder than that of the Lower Ens, though it lies in the same latitude; and much more so in the south than in the north. The Alpine tracts are very sterile; but some of the low spots are extremely fertile. The mineral products include marble, alabaster, crystal, gypsum, garnet, beryl, topaz, emerald, gold, silver, copper, lead, iron, salt, cobalt, sulphur, and coal.

The majority of the inhabitants (who, in 1840, numbered about 858,000) are of the same stock as the Bavarians. On the banks of the Ens and Traun are some villages peopled with individuals of Sclavonian extraction. The Roman Catholic is the predominant religion, and there are not above 30,000 Protestants in the whole province.

Agriculture is said to be in a more advanced state in the Upper than in the Lower Ens. The quantity of land under the plough is estimated at 1,162,510 acres: wheat, barley, oats, and rye are the chief crops. About 35,600 acres are occupied as garden-ground; about 115 only for vineyards; about 510,600 as meadows; and 1,106,800 are used for grazing cattle. It is calculated that 1,346,900 are covered with woods and forests. The rearing of cattle is general. The race of horses and the race of cattle are both of large size. The sheep are of an inferior race, and none of them yield fine wool. Goats abound in the upland parts. The lynx, wolf, and bear, are occasionally met with; foxes, stags, deer, marmots, polecats, squirrels, martens, hares, and wild-fowl, are more or less plentiful. Fresh water fish are abundant; and the beaver, otter, and pearl muscle, are occasionally met with.

The manufactures of this province, though less extensive than those of the Lower Ens, are considerable, and are of the same general description. The exports are very considerable, and consist principally of salt, timber, wood for fuel, yarns, linens, woollens, carpets, ironware, tools, nails, screws, cutlery, flax, cotton-yarn, cottons, stockings, cheese, beer, cattle, earthenware, mill and polishing stones, stone for building, marble, and fruit.

The Salzkammergut (salt domain of the emperor) is situated in this province, and yields a clear revenue of 70,000*l.* annually.

(Blumenbach; Lichtenstern; Hassel's *Archduchy of Austria*; Röhrer's *Statistics*; *Historical and Statistical Survey of the Austrian Monarchy.*)

ENSIGN, a commissioned officer, the lowest in degree, and immediately subordinate to the lieutenants in a regiment of infantry. One of this rank is appointed to each company, and the junior ensigns are charged with the duty of carrying the colours of the regiment. Ensigns in the regiments of foot-guards have also the rank of lieutenants. In the rifle brigade, and in the royal corps of artillery, engineers, and marines, in place of an ensign, a second lieutenant is attached to each company.

The price of an ensign's commission in the foot guards is 1200*l.*, and his daily pay is 5*s.* 6*d.*; in the regiments of the line the price is 450*l.*, and the daily pay 5*s.* 3*d.*

ENSIGN. [BANNER.]

ENSISHEIM, or ENSHEIM. [HAUT-RHIN.]

ENTABLATURE. [CIVIL ARCHITECTURE.]

ENTERI'TIS, acute inflammation of the external or peritoneal coat of the intestines. When inflammation is seated exclusively or chiefly in the peritoneal coat of the intestines, both the local and the constitutional affection is widely different from that which is produced when inflammation is seated in the mucous coat. It is therefore with good reason that these diseases are distinguished by different names.

The distinctive characters of enteritis are pain in the bowels, vomiting, obstinate constipation, fever, and sudden and great prostration of strength. The pain is often exceedingly severe, and is usually especially acute about the navel. The vomiting, though occasionally absent, is pretty constantly present, and is sometimes frequent and distressing. Obstinate constipation is a diagnostic mark of enteritis. It is not indeed invariably present, but it is present in so large a proportion of cases, that when absent it must be considered as an exception to the general rule. Its absence however should leave no doubt upon the mind of the nature of the attack if the other symptoms are present.

More or less fever is always present. The skin is usually hot and dry; the tongue white and furred; there is much thirst, and the pulse is quick, small, sharp, and incompressible. The expression of the countenance is peculiar, and the impression upon the powers of life is so great and rapid that the patient is far more exhausted after a few hours' illness in this disease than after an attack of as many days' duration in most other acute maladies. As the inflammation advances the pulse becomes more rapid and feeble; the abdomen swollen, tense, and tympanitic; the prostration increases; the skin, instead of being hot, becomes cold and clammy, and the extremities more especially are cold.

The exciting causes of the disease are acrid and indigestible matters taken into the stomach in large quantity; habitual full living on highly seasoned food; the accumulation of hardened fæces, cold drinks, especially when the body had been previously overheated. But perhaps the most common cause of the disease is cold, combined with moisture, applied either directly to the abdomen, or to the body generally, and more especially to the lower extremities. It attacks persons of all ages, from the infant a day old, to the man who reaches the extreme term of human life. It may occur at all seasons of the year. Its attack is often sudden, and it sometimes proves fatal with frightful rapidity. It is by no means uncommon for a person apparently in sound health to be destroyed by this disease within twenty-four hours from the commencement of the attack.

Hence the importance of a knowledge of its early symptoms, and the necessity of attacking it with the utmost promptitude and vigour. The ordinary remedies for inflammation must be employed with decision. Bleeding local and general, mild aperients, calomel, and opium, especially the latter, are the principal remedies.

ENTOBIA, a genus of fossil *Annelida*. (Portlock.)

ENTOMOCO'NCHUS, a genus of fossil *Crustacea*, from the mountain limestone of Ireland. (M'Coy.)

ENTOMO'LOGY, that branch of science which treats upon insects. The term *Entomology* literally signifies a discourse upon insects, it being derived from the two Greek words *éntomon*, and *logos*, a discourse.

The term entoma was first applied to these animals by Aristotle, and is synonymous with the Latin word insecta (whence is derived the English name *insects*), both having reference to a striking character exhibited in the insect tribe, that of having the body *insected*, or as it were cut and divided into numerous segments. [INSECT.]

ENTOMOSTO'MATA, De Blainville's name for his second family of his first order *Siphonobranchiata*, of his first subclass *Paracephalophora Dioica*, of his second class *Paracephalophora* of *Malacozoa*. These are a group of univalve shells, constituting the genus *Buccinum* of Linnæus, and placed by Cuvier in his order *Gastropoda Pectinibranchiata*. ('Règne Anim.' vol. iii.)

General Characters.—Animal spiral, with the foot, which is shorter than the shell, rounded in front. Mantle provided in front of the respiratory cavity with a long canal always uncovered, which the animal uses as an organ of prehension. Head furnished with a single pair of blackish tentacula, which carry the eyes on an enlargement of the half of their base. Mouth armed with a proboscis, as in the family of the *Siphonostomata*, without any labial tooth, but with a small tongue. Organs of respiration formed by two unequal pectinated branchiæ. Termination of the oviduct in the females at the right side, at the entrance of the branchial cavity. Termination of the deferent canal at the extremity of a long flattened contractile excitatory appendage, situated at the right side of the neck. Shell very variable in form, of which the opening, sometimes very large and sometimes very small, is without an apparent canal, or with a very short one suddenly recurved upwards, but always more or less deeply notched anteriorly. Operculum horny, unguiform, oval, subconcentric, with the summit a little marked and marginal.

De Blainville observes that this family differs evidently very little from that of the *Siphonostomata*, either in the soft parts or in the shell. The species which it embraces are not all absolutely marine, though a very great number of them are: some live at the mouths of rivers; and a very small number are entirely fluviatile.

The genera included in this group are very numerous, and abound with species, to which recent researches have immensely added. In a work like the present, a mere outline of De Blainville's arrangement, is the utmost that can be attempted.

Genera.—Turriculated.

1. *Cerithium.*—Divided into six sections, some of which have been regarded by Lamarck, Defrance, Deshayes and others as distinct genera. The species, mostly from the Indian Ocean, the Moluccas, the coasts and salt marshes of India, are numerous; and so also are the fossil species, in the tertiary system, M. Deshayes enumerating in his tables 220.

An interesting paper on the anatomy of *Cerithium* will be found in the 'Zool. Journal,' vol. v. p. 431, by the Rev. M. J. Berkeley, A.M., and G. H. Hoffman, Esq. In the 'Proceeds. Zool. Soc.' 1834, p. 22, will be found an account by Mr. Gray of the arrival in England of two living specimens of *Cerithium armatum*, from the Mauritius, which had been brought thence in a dry state, and retained their vitability in a sort of torpor, reminding us of the hybernation of the inhabitants of land shells. In the same page is another account of a living specimen of the *Cerithium telescopium* from Calcutta, in company with small *Paludinæ*; these however were kept in sea water frequently changed.

2. *Melanopsis.*—A fluviatile rather than a marine genus, divided into three sections, subterriculate, oval, and convex. Fossil species occur in the tertiary strata, of which some are identical with living species.

3. *Planaxis.*—Littoral shells found under stones in warm latitudes. The species are not numerous. The tertiary strata afford five or six fossil species.

4. *Subula.*—Two sections: 1, Beautiful, turriculated, smooth, and pointed shells from the Moluccas and Pacific Ocean. 2, Turbinaceous, or in the shells of which the spire is moderately elongated, rarely subturriculated.

5. *Terebra.*—Closely allied to *subula*, and inhabiting warm latitudes. Fossil species occur in the oldest deposits of the tertiary system.

6. *Eburna.*—A genus containing few species, from the seas of warm climates: they live in sandy mud. Deshayes records five living species, and one fossil (tertiary).

7. *Buccinum.*—Whelks. Carnivorous shell-borers which prey upon the tenants of other shells, piercing them by means of a borer peculiarly constructed. (Mr. Ostler in 'Phil. Trans.,' 1832; Dr. Buckland's 'Bridgewater Treatise.') These mollusks are widely spread, species occurring in almost all seas. From some of these whelks now placed under the genus *Purpura*, the ancient Tyrians are supposed to have collected their celebrated dyeing material. For an account of the dye of the *Buccinum lapillus* (*Purpura lapillus*) of our coasts, by Mr. Cole, of Bristol, see 'Phil. Trans.' ii. 826. Fossil species of the genus *Buccinum* are very common, and occur in the older deposits of the tertiary system.

8. *Nassa.*—Habits like those of *Buccinum*. The species belong chiefly to the warmer climates, a small number being natives of the seas of Europe. Fossil *nassæ* are tolerably numerous.

Ampullaceous, or whose shells are in general globular.

9. *Harpa.*—This genus is found in the seas of warm climates, and is more particularly abundant at the Mauritius and the neighbouring islands, whence the finest of the more common species, and the Many-Ribbed Harps are procured. They are shells of extreme beauty, and great favourites with collectors. Fossil species are not numerous. Deshayes enumerates only two.

10. *Dolium.*—It is to the warmer seas, especially those of India, that these shells are confined; one species however, *Dolium galea*, inhabits the Mediterranean. There are but few fossil species ascertained.

11. *Cassidaria.*—Locality, the seas of warm climates, but one species (*Cassidaria echinophora*) inhabits the Mediterranean. Fossil *Cassidariæ* are not numerous.

12. *Oniscia* (G. B. Sowerby).—Allied to *Cassidaria*. Habits littoral. Locality, the warmer seas. The species are few in number, and only one fossil species is recorded; it is from the Italian tertiary.

13. *Cassis.*—Though two or three species of this genus are found in the Mediterranean, it may be considered as occurring chiefly in warm latitudes. The living species are numerous, but Deshayes enumerates only fifteen as fossil (tertiary).

14. *Ricinula.*—Coral reefs and rocks in the Indian Seas. A single fossil species is recorded by Deshayes.

15. *Cancellaria.*—Indian and African seas, and the warm latitudes of the Pacific side of South America. Many new species have been discovered by Mr. Cuming. The fossil species are numerous in the earliest and newest of the tertiary deposits.

16. *Purpura.*—This form is widely distributed, but the number of European species is small. The greatest development takes place in warm seas, where the species are most abundant, particularly in South America. The fossil species do not appear to be in proportion to those extant.

Patelloid Entomostoma, that is, with the shell very large in its totality, very flattened, with a spire but little marked, and without a columella.

17. *Concholepas.*—Of this genus only one species is known; but M. Rang states that there are two distinct varieties. It is the *Concholepas Peruviana*, very abundant on the coasts of Peru and Chile. *Concholepas* is not known in a fossil state properly so called; it occurs however among the species of the coast at considerable elevations above the sea.

ENTOMOSTRACA (Müller), Shell Insects; for such is the meaning of the term applied to certain aquatic animals, forming, according to

Latreille and others, the second general division of the Crustacea, and for the most part inhabiting fresh water. The heart is in the form of a long vessel. The branchiæ composed of hair-like processes, which are either isolated or connected in a beard-like form; a pectinated shape, or one resembling aigrettes, form a portion of the feet, and sometimes of the mandibles and the upper jaws. [BRANCHIOPODA.] The feet are natatorial; their number varies, in some genera amounting to above a hundred. Most are enclosed in a delicate transparent bivalve shell, which is periodically moulted and renewed. Certain groups are parasitic and suctorial, adhering to fishes and other marine animals, upon whose juices they feed; such are the *Siphonostomata*.

Many undergo a strange metamorphosis in their progress from the egg to maturity, especially the species of *Cyclops*, of the *Phyllopoda*, and of *Argalus*. The antennæ vary in form and number, and serve in many for the purpose of swimming. [BRANCHIOPODA, PŒCILOPODA, BINOCULUS, XIPHOSURA, SUCTORIAL CRUSTACEANS.]

In the last edition of Cuvier's 'Règne Animal' M. Latreille divides the *Entomostraca* into two orders.

I. BRANCHIOPODA. II. PŒCILOPODA.

The Pœcilopoda he divides into two families.

1st. *Xiphosura.*

This family consists of one genus, *Limulus.*

2nd. *Siphonostoma.*

This family he separates into two tribes.

1. *Caligides.*

This tribe contains the genera *Argulus, Caligus,* and its sub-genera *Pandarus, Dinemoura,* &c., and *Cecrops.*

2. *Lernæiformes.*

This tribe consists of *Dichelestium* and *Nicothoë.*

M. Milne Edwards proposes the following method of arrangement, differing from that of Latreille, not only in the number of the orders, under which the different *Crustacea* are arranged, but also in the limits assigned to many of their divisions. ('Histoire Naturelle des Crustacés; Suites à Buffon.')

A.

Mouth deprived of special organs of mastication.

Orders.—*Xiphosures, Siphonôstomes.*

B.

Mouth armed with special organs of mastication, viz., with one pair of mandibles, and with one or more pairs of jaws.

Orders.—*Ostrapodes, Cladocères, Phyllopodes, Copépodes, Lœmipodes, Isopodes, Amphipodes, Stomapodes, Decapodes.*

The reader who wishes to study the classification, economy, and anatomy of the *Entomostraca,* should more particularly consult, besides the works above alluded to, those of Swammerdam, Needham, Leuwenhoek, De Geer, Ramdhor, Schoeffer, Straus, Hermann, the younger Fabricius, the Jurines, father and son, Adolphe Brongniart, Slabber, Desmarest, De Blainville, Thompson, and Audouin.

ENTOZO'A (from the Greek words *entos* (ἐντὸς), within, and *zóon* (ζῷον) an animal). Under this name are designated the different living beings which are produced and developed within other living beings. It comprehends a series of animals differing greatly from one another in form and organization, and having but one character in common; which is, that they are all parasitic, or have their exclusive habitation in and live at the expense of the bodies of other animals. They can scarcely be said to form a distinct class in the animal kingdom, some of the species being closely resembled, both in external appearances and internal structure, by individuals placed in other classes, and only differing from them in the localities where they are found: thus the *zoosperms,* or seminal animalcules, which are enumerated by some zoologists with the entozoa, closely resemble the true *cercariæ* of vegetable infusions.

Entozoa are found in most animals: they have been discovered in all the mammalia from man down to the cetacea; they also occur in the other classes of the vertebrata; indeed, it seems that a greater number reside in birds, reptiles, and fishes, than in mammals. The invertebrata have also their peculiar parasites; and they have been ascertained to exist in all the insect tribes, and in beings still lower in the scale. The best known species are those which inhabit the intestines of the human subject, and vulgarly go by the denomination of worms, which term was probably derived from the resemblance which the *Ascaris lumbricoïdes* bears to the common earth-worm, as this species is most frequently met with, and was the first described of the human entozoa, being mentioned by Hippocrates, who called it the ἕλμινς στρογγύλος, or round worm.

A short list of the different kinds of worms found in the human intestinal canal, with an enumeration of their causes, the morbid symptoms which they occasion, and the mode of treatment, are given under the article ANTHELMINTICS.

With regard to the causes of the formation, or the primary origin of the entozoa, nothing is known; and the whole subject is entirely involved in darkness. They must either be supposed to be the product of spontaneous generation, or the germs of them are introduced from without. Many arguments have been adduced on both sides of the question, but as the discussion would lead to no useful results, we shall leave it untouched, and proceed to give a short sketch of the arrangement of these curious and interesting animals.

Availing himself of the difference in their internal organization, Cuvier divided them into the 'cavitaries,' or those which have an abdominal cavity, and a distinct intestinal canal within it, and the 'parenchymateux,' or those in which no intestinal tube is traceable, and which for the most part consist throughout of an homogeneous structure; but this classification is any thing but a natural one, as worms the most dissimilar in their general appearance are here promiscuously congregated together. Mr. Owen, in an article in the 'Cyclopædia of Anatomy,' has adopted the arrangement of Cuvier, only inventing new names derived from the Greek, instead of the French terms: thus he denominates the 'parenchymateux' 'sterelmintha,' from *elmins,* 'a worm,' and *stéreos,* 'solid;' and the 'cavitaries' 'cœlelmintha,' from *elmins,* and

cœlos, 'hollow.' Zeder laid the first foundation of a good classification of these animals, dividing them into five classes, afterwards called families, at Rudolphi's suggestion; and these were again subdivided into genera and species. Rudolphi himself doubted the possibility of ever reducing all the species of entozoa to absolutely natural and well-defined families, but as Zeder's system seemed the most perfect, he has adopted it for his own.

According to this classification the entozoa are divided into five orders, or families, the *Nematoidea*, *Acanthocephala*, *Trematoda*, *Cestoidea*, and *Cystica*. The only point in which we shall depart from this arrangement will be, that, instead of commencing with the most perfect, and descending to the most simple, we shall begin with the lowest in the scale of organization, and ascend to those possessing the most complicated structure, as this is most in accordance with the laws of the animal kingdom.

Order I. is *Cystica* (from *cystes* (κύστις) a bladder), Hydatids. The characters are:—Body flattish, or roundish, and terminating posteriorly in a transparent cyst filled with pellucid fluid, which is sometimes common to many individuals; the head is retractile, and provided with pits two or four in number, or four suckers and a circle of hooklets, or with four unarmed or uncinated tentacles. The organs of generation and nutrition are unknown. This is not a very natural family, the species being closely allied to those of the next order in the structure of the heads, and the *Ecchinococcus*, or granular hydatid, though referred to it, is not hollow.

Order II. *Cestoidea* (from *cestos* (κεστός), 'a band;' and *eidos* (εἶδος), 'form'), Tape-Worms. Characters:—Body elongated, flattened, soft, continuous, or articulated, furnished with lateral or marginal pores, and erectile papillæ passing through them, supposed to be the male organs of generation. Head generally provided with two or four pits, or suctorial orifices, and sometimes with four retractile, unarmed, or uncinated tentacles; but the head is so dissimilar in different genera, and their shape varies so much, that they do not form a very natural family. There is no trace of intestinal canal; unless the vessels proceeding from the suckers be considered as such. In some species nutrient vessels and ovaries are to be seen. They all infect the human race.

Order III. *Trematoda* (from *trema* (τρῆμα), 'a foramen'), Fluke Worms. Characters:—Body soft, rounded, or flattened. Head indistinct, with a suctorial foramen; one or more suctorial pores on the under surface of the body, which furnish the grounds for their subdivision into genera: they have no intestinal canal, and the organs of generation of the two sexes coexist in the same individual. This is a very natural order.

Order IV. *Acanthocephala* (from *acantha* (ἄκανθα), 'a thorn;' and *cephale* (κεφαλή), 'the head'), Hooked Worms. Characters:—Body elongated, round, subelastic; the anterior extremity or head has a retractile proboscis, furnished with hooks or spicula, arranged in rows. They have no intestinal canal, but distinct genital organs, and a separation of the sexes. This is a very natural group, and includes the most noxious of the internal parasites. There is only one genus, and no species is known to infect the human body.

Order V. *Nematoidea* (from *nema* (νῆμα), 'a thread,' and *eidos*, 'form'), Round Worms. Characters:—Body cylindrical, elongated, and elastic; structure very complicated, there being a true intestinal canal, terminated by a distinct anus. The mouth by its varieties affords generic characters; the sexes are distinct; the females, which are longer than the males, being for the most part oviparous. They constitute a very natural order.

To this order belongs the *Ascaris* [ASCARIDES], a genus of which 10 species have been described, and of which one, the *Ascaris lumbricoides*, is well known. It inhabits the small intestines of the human subject, and those of the hog, the ox, and other animals. Another species, the Maw-Worm or Thread-Worm, *Ascaris vermicularis*, inhabits the lower part of the large intestines, and often causes great irritation.

(Cuvier's *Règne Animal*, vol. iii.; *Cyclopædia of Anatomy*; Rudolphi; Otto, Zeder, De Blainville, and others.)

ENTRAIGUES. [AVEYRON.]

ENTRE-DOURO-E-MINHO, a province of Portugal, bounded N. by the Minho, which separates it from Gallicia in Spain, S. by the Douro, which divides it from the province of Beira, W. by the Atlantic, and E. by the province of Tras-os-Montes. Its length is about 80 miles from N. to S., and its breadth is about 40 miles. Its area is about 3000 square miles, and its population about 1,000,000. The surface of the province is hilly, but there are some plains near the sea-coast. One ridge of mountains, the Serra de Marão, runs from north to south through the east part of the province; the rivers Cavado, Ave, and Neiva, which flow south-west into the Atlantic, have their sources in these mountains. The river Lima, which, next to the Douro and the Minho, is the largest in the country, has its source in the mountains of Gallicia; it flows south-west across the province, passes Ponte-de-Lima, and enters the sea near Viana. The river Tamega, which has its source in Tras-os-Montes, flows through this province in a southern direction, passes by Amarante and Canavezes, and then enters the Douro.

The province is the most fertile in Portugal, the climate is healthy, and the soil is irrigated by numerous streams. The principal productions are wine, oil, flax, Indian corn, wheat, oats, vegetables, and fruits of all sorts. Pastures are rather scarce, yet a considerable quantity of cattle, both large and small, are reared. The principal article of exportation is wine, which is made chiefly from the vineyards in the valley of the Douro, and is shipped at Oporto under the name of port-wine. There are fisheries along the coast, which occupy a great number of hands.

The province, which is sometimes called Minho simply, is divided into two administrative divisions, Alto Minho and Baixo Minho, each having its military and civil governors and its courts of justice. Alto Minho includes the comarcas of Braga and Viana, which comprise all the northern

part of the province; Baixo Minho includes the comarcas of Oporto, Guimarães, Penafiel, Amarante, and all the country southwards as far as the Douro.

The principal towns, from which the comarcas are named, are—BRAGA: OPORTO: *Guimarães*, on the river Ave, an ancient town, once the capital of the monarchy, at present an industrious busy place of 7000 inhabitants, with manufactures of linen, leather, and cutlery: *Viana*, with 8000 inhabitants, and a harbour at the mouth of the Lima, carrying on a considerable trade: *Villa do Conde*, with a small harbour, and 3000 inhabitants: *Barcelos*, on the right bank of the Cavado, with 3900: *Valença*, on the Minho, a frontier town and fortress, with about 1600 inhabitants: *Penafiel*, with 2300: *Caminha*, at the mouth of the Minho, with a harbour, and about 1000 inhabitants: *San João da Foz*, at the mouth of the Douro, below Oporto, with 3300 inhabitants: and *Amarante*, on the Tamega, with about 1000 inhabitants.

ENTRESOL, a French term used to signify a floor between other floors. The entresol consists of a low apartment or apartments, usually placed above the first floor. There is a very good example of an entresol under the colonnade of the Quadrant in London. In continental cities the entresol is frequently employed.

ENTRY, from the French *entrée*, and Latin *intrare*, to enter, is a taking possession by the legal owner of lands and tenements when another person is wrongfully in possession of them. At the common law this might be effected by force; but as it was the cause of great abuses, forcible entries were made punishable by fine and imprisonment by two statutes of Richard II., enlarged by a statute of 8 Henry VI., c. 9. (See 1 Ad. and E. 627, and 3 Ad. and E. 817.)

A party availing himself of this summary process must enter upon some part of the property claimed, and the safer course is formally to declare that thereby he takes possession of the whole. The entry must be repeated in each county in which the lands lie. This remedy however can only be adopted in cases where the original entry of the holder of the land was by unlawful means.

In other cases, where the original entry is lawful, and possession held by an apparent right, the owner of the estate must proceed by an action.

The Statute of Limitations, 21 James I., c. 16, the 4 & 5 Anne, c. 16, and the 3 & 4 Will. IV., c. 7, regulate the law on this subject, and also the periods within which entries may be made.

Forcible Entry, is an entry made with a strong hand, with unusual weapons, an unusual number of servants, or with menace of life. If effected with violence, and the entry only amounts to a trespass, it is not within the meaning of the statutes of Richard II. above referred to. The remedy for parties aggrieved, and the mode of obtaining restitution, is either by an action at law, by indictment, or by justices of the peace upon the view. If made by more than three persons, they may be proceeded against as in a case of riot.

Writ of Entry, was another method of gaining possession of disputed property, by trying the title of the occupant. But by the 3 & 4 Will. IV., c. 27, all writs of entry as well as writs of right were abolished, from the 31st December, 1834.

ENVOY, a diplomatic minister or agent, inferior in dignity to an ambassador, but generally invested with equal powers. [AMBASSADOR.]

ENYED. [NAGY-ENYED.]

EOCENE. The lowest of the three great divisions of tertiary strata is thus termed by Mr. Lyell.

EOLI'DIA, Cuvier's name for a genus of NUDIBRANCHIATA, the second order of his *Gasteropoda*. Cuvier describes his *Eolidiæ* as having the form of small snails or slugs, with four tentacula above and two at the sides of the mouth. The branchiæ, he observes, are laminæ or foliations disposed like scales, more or less close set on each side of the back. The head is distinct; the body gelatinous. These minute snail-like animals are found in all seas. Rang says that the masses of *Fucus natans*, so often met with between the tropics, always present a great number of them. They do not swim, but suspend themselves at the surface of the water with the feet uppermost, and move well by means of sudden undulations.

This genus is divided into two sections: 1st, *Eolidia*, with the branchiæ disposed in transverse rings distant from each other. Example, *Eolidia Cuvieri*. Locality, European seas. 2nd, *Cavolina*, little differing from the preceding. Example, *Cavolina peregrina*. Locality, the Mediterranean.

EPACRIDA'CEÆ, a natural order of monopetalous exogens, very closely allied to *Ericaceæ*, with the small-leaved genera of which they entirely agree in habit, and from which they are scarcely distinguishable.

The species consists of shrubs with alternate or occasionally opposite leaves. The size and colour of the corolla are often striking, and the species then become exceedingly showy, and are favourites with gardeners.

EPACT, the number of days in the moon's age at the beginning of the year.

EPAMINONDAS, a Theban statesman and soldier, in whose praise, both for talents and virtue, there is a remarkable concurrence of ancient writers. Nepos observes that, before Epaminondas was born, and after his death, Thebes was always in subjection to some other power: on the contrary, while he directed her councils, she was the head of Greece. His public life extends from the restoration of democracy, by Pelópidas and the other exiles, B.C. 379, to the battle of Mantineia, B.C. 362. In the conspiracy by which that revolution was effected he took no part; but thenceforward he became the prime mover of the Theban state. His policy was first directed to maintain the power of Thebes over the other cities of Bœotia, and in this cause he ventured to engage his country, single-handed, in war with the Spartans, who marched into Bœotia, B.C. 371, with a force superior to any which could be brought against them. Epaminondas prevailed on the Thebans to attack the Spartans, who sustained a memorable defeat at Leuctra.

This brilliant success led Epaminondas to the second object of his policy—the overthrow of the supremacy of Sparta, and the substitution of Thebes as the leader of Greece in the democratical interest. A Theban army, under his command, marched into Peloponnesus early in the winter, B.C. 369, and in conjunction with the Eleians, Arcadians, and Argians, invaded and laid waste a large part of Laconia. Numbers of the Helots took that opportunity to shake off a most oppressive slavery; and Epaminondas established these descendants of the old Messenians on Mount Ithóme, in Messenia, as an independent state.

In 368 B.C. Epaminondas again led an army into Peloponnesus; but not fulfilling the expectations of the people, he was disgraced. He is not again heard of in a public capacity till B.C. 366, when he was sent to support the democratic interest in Achaia, and by his moderation and judgment he brought that whole confederation over to the Theban alliance.

A great part of the Peloponnesus soon returned to the Lacedæmonian alliance, and to check this defection Epaminondas led an army into Peloponnesus for the fourth time, B.C. 362. Joined by the Argians, Messenians, and part of the Arcadians, he endeavoured to take Sparta by surprise; but the vigilance of Agesilaus frustrated this scheme. Epaminondas then marched against Mantineia, near which was fought the celebrated battle in which he received a mortal wound, just at the time when the Lacedæmonian line was broken. Each side claimed the victory, and the battle of Mantineia had no result.

(Xenophon, *Hellenica;* Plutarch, *Pelopidas, Agis*, &c.)

EPAULEMENT, a mass of earth, about 7 feet 6 inches high and 18 or 20 feet thick, raised for the purpose either of protecting a body of troops at one extremity of their line, or of forming a wing or shoulder of a battery. The term is also used to designate the whole mass of earth or other material which protects the guns in a battery both in front and on either flank. That part of the epaulement which is between every two embrasures is called a merlon; and the part under the embrasure is called the genouillère.

EPE'E, CHARLES MICHEL DE L', was born at Versailles, in November, 1712. He was educated for the church, was ordained, and received a canonry in the cathedral of Troyes.

An accidental circumstance led him to devote himself to the instruction of the deaf and dumb, and he persevered until he converted opposition and contempt into approbation. His income was about 400*l.*, of which he allowed about 100*l.* for his own expenses, and appropriated the remainder to the support and instruction of indigent mutes.

M. de l'Epée died December 23, 1789, aged 77. He ranks deservedly among those whose lives have been devoted to the amelioration of the condition of their fellow men, and the fruit of whose labours do not die with them. [DEAF AND DUMB.]

EPERIES (*Pressova*), a royal free town in Upper Hungary, stands in 48° 58′ N. lat., 21° 15′ E. long., and has about 9000 inhabitants. It is situated in an agreeable country on the banks of the Tartsza, and is surrounded with walls defended by bastions, which are encircled by extensive gardens and inclosures. The streets are broad, and embellished with several handsome buildings. It is the seat of a Greek Catholic bishop, has a good episcopal library, 4 Catholic churches, 1 Luthernn church, a synagogue, a college, high school, normal school, orphan asylum, &c. Eperies manufactures woollens and linens, and possesses a large earthenware manufactory and breweries, as well as a considerable trade in cattle, wine, and grain.

EPERNAY. [MARNE.]

EPHEDRA, a genus of plants belonging to the natural order *Gnetaceæ*. The species are not numerous, and are found in Europe, Asia, Africa, and America. *E. distachya* is a native of France and some parts of Germany, and abounds in the southern parts of Europe, and from thence eastwards to Persia and India. The berries, which consist of the fleshy calyx covering the ovarium, ripen in July and August. They have a sweetish taste, and contain a mucilaginous juice. *E. monostachya* is found in Hungary and Siberia, and in these countries the fruit is eaten as a great luxury.

EPHE'MERA (*ἐφήμερα*, living for a day), a genus of Neuropterous insects belonging to the family of *Subulicornes* of Latreille. They have long, soft, tapering bodies, terminating in two or three long setæ. Their wings are placed nearly or quite perpendicularly. Their antennæ are very small and three-pointed. In the larva state they live in wet places or under water, and enjoy an existence of two or three years; but when they attain their final stage of metamorphosis and perfect form, they are among the most fleeting of living creatures, existing often only a few hours, and propagating their species before they die. In this state they sometimes appear suddenly in myriads, during fine summer evenings, by the water-side, where they may be seen flitting about and balancing themselves in the air, in the manner of gad-flies. [BAETIS.] (Westwood, *Introduction to Entomology*, vol. ii.)

EPHE'MERIS (*ἐφημερίς*, from *ἐπί*, and *ἡμέρα*), a name given to almanacs, from their containing matter for each day. In astronomy it is usual to call any table which assigns the place of a planet for a number of successive days an Ephemeris of the planet.

EPHESIANS, ST. PAUL'S EPISTLE TO THE, is the fifth, in numerical order, of the fourteen apostolical letters of St. Paul, contained in the canon of the New Testament. Throughout the primitive ages of Christianity it was regarded by the principal fathers as being of genuine and sacred authority. It is cited by Ignatius, Irenæus, Clemens Alexandrinus, Tertullian, Origen, and many subsequent Christian writers. There were however several important and numerous sects, who, in the first and second centuries, denied both the genuineness and the authenticity of this and the other writings of St. Paul; rejecting them as a tissue of errors, and denouncing St. Paul himself as an apostate, and a perverter of the original system of Jesus of Nazareth. The place and date generally assigned to this epistle

by biblical critics are Rome, A.D. 61, that is, in the first year of the apostle's imprisonment at Rome. The object appears to be to establish an earnest faith in the doctrines of Christianity, by giving exalted notions of their importance and moral excellence, and to encourage a perseverance in the Christian warfare with temporal and spiritual enemies.

E'PHESUS, a city of Asia Minor, and one of the twelve that belonged to the Ionian confederation. (Herod. i. 142.) The ruins of the city are situated near the river Cayster, at a short distance from the place where it falls into the Bay of Ephesus, and near a modern village called Aiasalouk. (Pococke's 'Travels;' 'Antiquities of Ionia,' by the Dilletanti Society.)

The first great temple of Diana was built by Chersiphron, which having been set on fire by Heróstratus and destroyed, the great edifice described by Pliny was erected. This temple was a noted asylum for malefactors and for debtors, till this privilege was taken away by Augustus. In Strabo's time Ephesus was a place of great trade, and the chief commercial city of the western part of Asia Minor; and it would appear from the Acts of the Apostles (xix.) that it was a place of some note for workers in silver.

E'PHORI (Ἔφοροι), a body of magistrates at Sparta, five in number, who possessed great powers. The institution of this office is usually ascribed to Theopompus, the grandson of Charilaus the Proclid. The ephori were chosen in the autumn of every year. The first gave his name to the year. Every Spartan was eligible to the office. They were empowered to fine whom they pleased, and exact immediate payment of the fine; they could suspend the functions of any other magistrate, and arrest and bring to trial even the kings. (Xenophon, 'De Rep. Laced.,' viii. 4.) They presided and put the vote in the public assemblies (Thucyd., i. 87), and received and dismissed embassies (Xen., 'Hell.,' ii. 13, 19), treated with foreign states (Herod., ix. 8); and sent out military expeditions. (Xen., 'Hellen.,' ii. 4, 29.) The king, when he commanded, was always attended by two of the ephori, who exercised a controlling power over his movements. (Herod., ix. 76.) The ephori were murdered on their seats of justice by Cleomenes III., and their office overthrown; but they were restored by Antigonus Doson and the Achæans in 222 B.C. (Polyb., ii. 70); and the office subsisted under the Roman dominion. On the ephoralty, the reader may consult Müller's *Dorians*, book iii. c. 6.

E'PHORUS, a Greek historian, born at Cyme in Æolis, 405 B.C. He survived the passage of Alexander into Asia (333 B.C.), which he mentioned in his history. His style is said to have been low and slovenly, and Plutarch remarks upon the silliness of the set speeches which he introduced. Polybius observes that, though in his account of naval matters he is sometimes happy, he always fails in describing battles by land, and was entirely ignorant of tactics. ('Excerpt. Vatican.,' p. 391.) His chief work was a history of Greece, in 30 books, beginning with the siege of Troy, and terminating with the siege of Perinthus (340 B.C.). The Fragments of his works have been collected by Meier Marx, Carlsruhe, 1815.

EPHRAEM or EPHRAIM, an ecclesiastical writer of the fourth century of our era, was probably born in the town of Nisibis, though some state that he was born at Edessa. The time at which he attained the height of his fame is about A.D. 370. In his early youth he entered the monastic life, and was afterwards deacon of the church at Edessa, but he declined accepting any higher ecclesiastical office, and when he was elected bishop, he withdrew to Cæsarea in Cappadocia, where Basilius the Great formed the highest opinion of his learning and piety. Ephraem spent the greater part of his life in writing and preaching on devotional and moral subjects, and especially against the Arian heresy. He died about A.D. 378.

Ephraem was one of the most prolific writers of his time: he knew no other language than the Syriac, and was considered to surpass all his contemporaries in the elegance and power of his oratory. Nearly all his works were translated into Greek in his own lifetime, and their popularity was so great that in some churches they were publicly read after the Scriptures. Nearly all his works are extant, either in Syriac or in Greek and Arabic translations. The first collection of them that was published, though it is not complete, and only in a Latin translation, is that of G. Vossius, in three vols., folio (Rome, 1586–97; reprinted at Cologne, 1603, and at Antwerp, 1619). Assemani undertook to publish the Greek translation in three folio volumes, and the Syriac in three others. The first three volumes, edited by Assemani himself, appeared at Rome in 1732–46; and the last three, containing the Syriac, were edited by father Benedetti and Stefano Assemani. The Prolegomena to this edition contains everything worth knowing respecting the life and writings of Ephraem.

EPIC POETRY is that form of art which produces an imaginative description of external facts and occurrences, as distinguished from lyric poetry, which employs itself in registering, in an imaginative manner, all those internal facts and occurrences which go by the name of feelings and emotions.

Those who find this definition insufficient must remember that it does not and is not intended to apply to any single epic or lyric poem. With the exception perhaps of some of our old national romances, there does not exist an epic poem of any length which is perfectly free from lyrical passages; but this is no reason why we should confound the two forms of art, and not assign to poetry the one name or the other according to the proportion which it contains of either element.

Men look round them before looking within: natural philosophy has always preceded metaphysics, and epic poetry, as far as we know, has been prior to lyrical. Again, the imagination gets the start of the logical faculty. Men can invent before they can argue, and facts, real or supposed, are usually put in the imaginative form of epic poetry before they are recorded and examined with re-

gard to the conclusions which they suggest, as in political history. It may be objected, that though every individual goes through both epical and lyrical periods, there is no reason why the two forms of art should not have been contemporaneously produced; but it will be seen that a sufficient reason is supplied for the priority of that form which addresses itself to the spirit of action, in the fact that this spirit predominates in the earliest ages of society, to the complete repression of those contemplative feelings which in after ages have unrestrained exercise. The heroic age of Greece, for instance, as far as we know anything about it, was very little likely to encourage reflection, much less reflective poetry, and accordingly we hear nothing of such poetry for centuries after it had ceased.

The earliest specimens of this form of art, which probably consisted of tales rhythmically arranged and recited to a very simple musical accompaniment, no doubt belonged to the unconscious æra, during which the poet, setting before him no aim, or seeing it but imperfectly, acts purely from the stirring impulse of his own imagination. Into this class we may perhaps admit some of our oldest and simplest romances, but the poetry of Homer and Hesiod, the two-fold epic of the Greeks, cannot be denied to be, in great measure at least, the work of conscious artists.

There are two divisions into which the epic poetry of the Greeks naturally falls; the heroic or romantic epos of Homer and of the Cyclic poets, and the hieratic epos of Hesiod. The attention of that age was centered on two grand ideas, the state and religion; whence we find a political and a hieratic epos. The Iliad and Odyssey are the two poems which remain as specimens of the former kind, and they are particularly worth the attention of all who are interested in the history of epic poetry, as they afford by far the most perfect instance of poems of that kind composed in an age differing but little in its characteristics from that to which they refer, and stand consequently in strong contrast to the Æneid, a poem with which they are most frequently compared. The Æneid depends more on beauty of language and arrangement than on anything in the story calculated to excite the interest of its readers, though it contains the adventures of an individual; but the interest in Æneas is very inferior to the interest in Ulysses as created by the Odyssey.

Sacred poetry partakes strongly of a lyrical character, and Hesiod has perhaps struck out the only path which an epic writer in a simple age could follow without lapsing into the lyrical spirit as he approached theological subjects.

It has been observed by a German writer (Schelling, 'Vorlesungen,' &c., p. 224) that an epic poem has no regular beginning or end; it is a metrical and imaginative production, which, if it consist of narrative, may take it up and lay it down at any period. This is the case with the Iliad, as well as with the Odyssey and Æneid, although the last two are considerably more complex in the arrangement of the narrative, and evidently draw to a more decided close than the Iliad.

The early romantic epos is the first distinct form of modern art. The social life which came into existence on the breaking up of the Roman empire was productive of a series of events in literary history, similar perhaps to those which occurred in the times of Homer.

The northern nations possessed numerous poems of an epical kind, some of which remain, and may be read with interest. The cycles of romances on Troy and Alexander the Great compose a form of art which could only exist in a revival of imaginative spirit, as they derive their subjects from an older date and a different country, although as regards every thing but the name of Greek or Trojan, the hero is usually the countryman of the bard; but the numerous poems on Arthur, with 'Havelok the Dane,' and 'Horn Child,' in our own language, 'Beowulf,' in Anglo-Saxon, the poem of 'The Cid,' in Spanish, and the 'Nibelungen Lied,' in old German, are sufficient proofs of the coincidence of epic spirit with an early stage of society. The Italian epic arose somewhat later than that of any of the northern nations, which may be attributed to the fact that it was only to a strong admixture of barbarian blood that the Italians owed their restoration to political existence.

Perhaps the greatest difference which is traceable between the ancient and the modern epic has been produced by that spirit of devotion to the female sex which characterises all the Gothic nations; and arising, as it does, partly from the refinement of an instinct and partly from religious impressions, is superior, as a motive of action, to the mere unmitigated instinct for war which constitutes the prevailing feature of the ancient epic, or at least of the heroic poems.

We have been at no pains to notice those detached epic poems which have appeared at different times since the revival of learning, although some of the most noble specimens of this style of poetry are to be numbered amongst them; still less have we intended to give anything like sketches of any which we have mentioned.

EPICHARMUS was born in the island of Cos, and went to Sicily about 485 B.C. He is said to have been a pupil of Pythagoras. He and his brother were physicians. It appears that he resided some short time at Mégara in Sicily, and possibly removed to Syracuse when Gelo transported the inhabitants of Megara thither (484 B.C.). It was at Megara that Epicharmus probably got the idea of writing comedies; for the Megareans, as well in Greece as in Sicily, are spoken of as the originators of that branch of the drama. Epicharmus is called by Theocritus the inventor of comedy; and Plato says that he was the chief comedian, as Homer was the chief tragedian. ('Theætet.,' p. 152, E.) The subjects of the plays of Epicharmus, says Müller ('Dorians,' iv. 7, s. 2), were mostly mythological, that is, parodies or travesties of mythology, nearly in the style of the satyrical drama of Athens. Thus, in the comedy of 'Busiris,' Hercules was represented in the most ludicrous light, as a voracious glutton with a mixture, perhaps, of satirical remarks on the luxury of the times), and in the 'Marriage of Hebe,' in which an astonishing

number of dishes was mentioned. He also, like Aristophanes, handled political subjects, and invented comic characters like the later Athenian poets. The piece called 'The Plunderings,' which described the devastation of Sicily in his time, had a political meaning. Epicharmus also introduced and almost perfected characters which were very common in the drama of later times; and if the plot of 'The Menœchmi' of Plautus was, as the poet seems to state in the prologue, taken from a comedy of Epicharmus, it shows that he could construct a plot ingeniously. Epicharmus lived to the age of ninety or ninety-seven. (Lucian, *Macrob.* xxv.)

EPICTETUS was born at Hierápolis, in Phrygia, probably some time in the reign of Nero. In some way he became a slave at Rome to Epaphroditus, who was a freed man of Nero's, and one of his body-guard. We are not told how or when Epictetus managed to effect his freedom; but he could not have been still a slave when he left Rome in consequence of the edict against philosophers, A.D. 89, in the eighth year of Domitian. Epictetus retired to Nicopolis, in Epirus; and it is a question whether he ever returned to Rome. The chief ground for believing that he did is a statement of Spartian ('Hadr.' 16), that Epictetus lived on terms of intimacy with the emperor Hadrian.

We do not know when he died. Aulus Gellius, writing during the reign of the first Antonine, speaks of Epictetus in two places as being dead. ('Noct. Att.,' ii. 18; xvii. 19.)

Epictetus led a life of exemplary simplicity and virtue. He lived for a long while in a small hut, with no other furniture than a bed and lamp, and without an attendant, until he benevolently adopted a child whom a friend had been compelled by poverty to expose, and hired a nurse for its sake. The biographers of Epictetus have also commemorated his love of neatness.

Epictetus was a teacher of the Stoic philosophy, and the chief of those who lived during the period of the Roman empire. An anecdote given in the 'Discourses' collected by Arrian (i. 7) seems to show that he had been a pupil of Musonius Rufus, a Stoic philosopher whom Nero banished to Gyara, and who was subsequently recalled to Rome by Vespasian. The lessons of Epictetus were directed to practical morality. His favourite maxim was 'Bear and forbear.' He appears to have differed from the Stoics on the matter of suicide. (Arrian, 'Epict.' i. 8.) We are told by Arrian, in his preface to the 'Discourses,' that he was a powerful and exciting lecturer; and, according to Origen ('contra Cels.' vi. ad. init.), his style was superior to that of Plato.

Like many other original men and founders of sects, Epictetus appears to have written nothing. His Discourses were taken down by his pupil Arrian, and published after his death in six books, of which four remain. Arrian also compiled the 'Encheiridion,' and wrote a life of Epictetus, which has been lost. [ARRIANUS.] Some fragments have also been preserved by Stobæus.

The best edition of all the remains of Epictetus is that by Schweighæuser, in six vols., Leipzig, 1799. The same editor has published the 'Encheiridion,' together with the Tablet of Cebes, in a separate volume. Coray published an edition of the 'Encheiridion,' with a French translation by another hand, in the seventh volume of the Parerga of his 'Bibliotheca Græca,' Paris, 1826, 8vo. There is an English translation of the 'Encheiridion,' or 'Manual,' by Mrs. Carter.

EPICU'RUS was born in the year 341 B.C., in the island of Samos, seven years after the death of Plato. But his father was an Athenian, and Epicurus was a citizen of Athens. Having passed his early years in Samos and Teos, Epicurus went to Athens at the age of eighteen. At this time Xenocrates was teaching in the Academy, and Theophrastus in the Lyceum; and it is said that Epicurus was a pupil of Xenocrates. But Epicurus used to boast that he had learned from no man but himself.

Epicurus did not stay long at Athens, and he went to Colophon to join his father. In his thirty-second year, 310 B.C., he went to Mitylene, where he set up a school. Staying only one year at Mitylene, he next went to Lampsacus, where he taught for four years. He returned to Athens in the year 306 B.C., and founded the school which ever after was named from him. He purchased a garden wherein he might live with his disciples and deliver his lessons; and henceforth remained in Athens, with the exception only of two or three visits to his friends in Asia Minor, until his death in the year 270 B.C. He was in his seventy-second year when he died.

Epicurus had numerous pupils. He lived with them in his garden in a state of friendship: they did not put all their properties together, but enjoyed them in common. The friendship subsisting between Epicurus and his pupils is commemorated by Cicero ('De Fin.,' i. 20). They lived in a frugal and virtuous manner, though their enemies took pains to represent their life in a different light. Epicurus did not marry, in order that he might be able to prosecute philosophy with less interruption. His most attached friends and pupils were Hérmachus of Mitylene, whom he appointed by will to succeed him in the school; Metrodórus, who wrote several books in defence of his system, and for whose children Epicurus, in his will, liberally provided; and Polyænus. On his death Epicurus left his garden and a house that he had near Athens to Hermachus, as head of the school, to be left by him again to whomsoever might be his successor.

Epicurus divided the whole field of knowledge into three parts, to which he gave the names respectively of *canonics*, *physics*, and *ethics*. The first two were subordinate to the third. The end of all knowledge, of ethics directly or immediately, of canonics and physics indirectly or mediately through ethics, was, according to Epicurus, to increase the happiness of man.

Canonics, which was a subject altogether introductory both to physics and ethics, treated of the means by which knowledge, both physical and ethical, was obtained, and of the conditions or (as they were called by Epicurus) *criteria* of truth. These conditions or *criteria* were, according to

him, sensations, ideas or imaginations, and affections. From these three sorts of consciousness we get all our knowledge. What Epicurus then called canonics, viewed in relation to physics and ethics, is, viewed absolutely or in itself, psychology.

In physics he trod pretty closely in the footsteps of Democritus. According to Epicurus, as also to Democritus and Leucippus before him, the universe consists of two parts, matter and space, or vacuum, in which matter exists and moves; and all matter, of every kind and form, is reducible to certain indivisible particles, atoms, which are eternal. These atoms, moving, according to a natural tendency, straight downwards, and also obliquely, have thereby come to form the different bodies which are found in the world, and which differ, in kind and shape, according as the atoms are differently placed in respect of one another.

In his ethics Epicurus taught that a man ought to increase his pleasures and diminish his pains as much as possible. He used the terms pleasure and pain in the most comprehensive way, as including pleasure and pain both of mind and body; and he esteemed the pleasures and pains of the mind as incomparably greater than those of the body. Making, then, good and evil, or virtue and vice, depend on a tendency to increase pleasure and diminish pain, or the opposite, he arrived at the several virtues to be inculcated and vices to be denounced. Morality, then, is the art of being happy, as a modern writer has defined it. (J. Droz, 'Essai sur l'Art d'être Heureux.')

Though Epicurus dispensed with a Divine Being as creator of the world, he yet did not deny the existence of gods. These gods were eternal and supremely happy, living in a state of quiet, and meddling not with the affairs of the world. He contended that they were to be worshipped on account of the excellence of their nature, not because they could do men either good or harm. (Cic. 'De Nat. Deor.,' i. 41; Seneca, 'De Benef.,' iv. 19.)

The two chief sources of knowledge concerning the doctrines of Epicurus are the tenth book of Diogenes Laertius, and the poem of Lucretius, 'De Rerum Natura.' Information is furnished also by the writings of Cicero, principally the 'De Finibus,' and the 'De Naturâ Deorum;' by those of Seneca; and the treatise of Plutarch entitled 'Against Colotes.'

Epicurus, according to Diogenes Laertius, wrote 300 volumes; but volume does not necessarily imply more than a roll, big or little. All that now remains of his works are the letters contained in the tenth book of Diogenes Laertius, and parts of two books of his Treatise on Nature (περὶ Φύσεως), which were discovered at Herculaneum. The last were published at Leipzig in 1818, edited by Orelli. A critical edition of the first two letters of Epicurus was edited by J. G. Schneider, Leipzig, 1813.

Diogenes Laertius is the principal authority for the life of Epicurus; brief and incidental notices are also supplied by Suidas, Cicero, Seneca, and Plutarch. There is an account of the life and a defence of the character of Epicurus, in eight books, by Gassendi (Leyden, 1647).

The Epicurean doctrines were adopted by many of the Romans under the later republic and the empire.

EPICYCLE, a circle, the centre of which is carried round upon another circle: a term of the Ptolemaic Hypothesis.

EPIDAURUS, a city of ancient Greece, situated on the eastern coast of Argolis, on a small bay in the Saronic Gulf, and surrounded by mountains on the land side. When the Dorians got possession of Argos, Epidaurus admitted a Dorian colony. The constitution of Epidaurus was originally monarchical. In the time of Periander of Corinth, his father-in-law, Procles, was tyrant of Epidaurus. (Herod. iii. 53.) Afterwards the government was aristocratical. Epidaurus was the mother-city of Ægina and Cos, the former of which was once dependent upon it. As the chief seat of the worship of Æsculapius, Epidaurus was for a long period a highly important place. The territory of Epidaurus was covered with vineyards in the time of Homer ('Il.' ii. 561), and the vine is still cultivated on the site (Leake, 'Morea,' ii. p. 430), which is indicated by a small village called Pídhavro.

There were two other cities of this name; one in Laconia called Epidaurus Limera, which had also a well-known temple of Æsculapius. The third Epidaurus was a maritime city of Illyricum, mentioned by Hirtius ('De Bello Alexandrino,' c. 44).

EPIDEMIC diseases are those which prevail among a large portion of the people of a country, rage for a certain time, and then gradually diminish and disappear, to return again at periods more or less remote. The cholera, influenza, various forms of fever, measles, &c., frequently assume this character.

EPIDENDRUM, an old name for all the orchidaceous plants which grow upon the branches of trees, and which are now called Epiphytes. [EPIPHYTES.]

EPIDERMIS, the external covering of the skin, commonly called *Cuticle*. [SKIN.]

EPIDOTE (*Thallite, Pistazite*), a mineral which occurs crystallized, massive, and granular. The primary form of the crystal is an oblique rhombic prism. It is semi-transparent, variously coloured, and has a vitreous taste, and a specific gravity of 3.4. It consists of silica, alumina, lime, and oxides of iron and manganese.

EPIGRAM (Ἐπίγραμμα, *Epigramma,*) an inscription, whence it comes to signify a short poem, such as might be comprised within the limits of an inscription. For an account of the class of poems called epigrams by the Greeks, see ANTHOLOGY. Much of early Greek history was preserved in epigrams, to which Herodotus and Thucydides often refer; as, for instance, those concerning the battle of Thermopylæ (Herod. vii. 228), one of which is thus literally translated:—'Here once four thousand from Peloponnesus fought with three millions.'

The Latin epigram approaches nearer to the English acceptation of the term. The most dis-

tinguished Latin epigrammatists are Catullus and Martial, in whom there is much wit, with much scurrility and obscenity; but many of the epigrams of Martial are epigrams in the Greek sense, and some of them are characterized by great propriety of thought and felicity of expression. The Latin Anthology of Peter Burmann the Younger contains a large collection of epigrams, by numerous authors, of which many resemble in simplicity the Greek epigrams.

In English the word signifies a short poem, which to be good in its kind must be clear, concise, and elegant in expression, and must contain a point, that is, some striking and unexpected turn of thought. Whether it be humorous or serious is indifferent. The following compliment addressed by Pope to Lord Chesterfield, on being asked to write with that nobleman's pencil, may serve as well as any for a specimen:—

> Accept a miracle: instead of wit,
> See two dull lines by Stanhope's pencil writ!

EPILEPSY (*Epilepsis* (ἐπίληψις), 'a seizing.' Synonymes: *Morbus divinus, herculeus, comitialis, caducus; Falling Sickness*), sudden abolition of sensation and consciousness, with convulsions [CONVULSION] of the muscles of voluntary motion, ending in a state of sopor or apparent sleep, the attack recurring in paroxysms more or less regular. The attack of epilepsy is usually quite sudden. The person, while in his ordinary health, and perhaps engaged in his usual occupation, utters a piercing scream. If standing, he falls to the ground, where he lies for a moment in a state of extreme rigidity, almost amounting to tetanic stiffness; but this state is quickly succeeded by convulsions, which variously agitate the limbs and the trunk of the body. The head is generally thrown backwards; the eyes are open, fixed, and staring; the pupils are dilated; the vessels of the head and neck are swollen, rendering the countenance flushed, and sometimes of a dusky hue; the muscles of the face are in violent action, producing frightful distortions of the countenance; the muscles that move the lower jaw close the mouth with violence, producing gnashing of the teeth; the tongue, which is swollen and livid, is thrust out forcibly between the teeth, and is often grievously wounded; the arms are sometimes tossed violently about the chest, or struck against it; the hands and fingers are in a state of rapid alternation, between the motions of flexion and extension; the lower extremities are agitated in a similar manner; the thumbs are drawn inwards, and the toes incurved; and a quantity of frothy saliva flows from the mouth, which is often bloody from the wounds inflicted on the tongue. The muscles on one side of the body are commonly more violently agitated than those of the other. The pulse, always difficult to be felt, is commonly quick and small; but it becomes distinct towards the end of the paroxysm, and is then more slow and languid. The action of the heart is irregular, tumultuous, and loud, and the carotids throb vehemently. After the contractions of the muscles have continued for some time, the convulsions diminish in violence, and at length cease altogether. Perspiration breaks out about the head, neck, and breast; the convulsive respiration is followed by sighs, and the spasms of the muscles by subsultus. The patient then falls into a sleep, from which he awakes either suddenly or gradually. Commonly there is no consciousness whatever of anything that has passed during the paroxysm. On coming out of the fit there is generally headache, and always languor. The convulsive stage may last from one or two minutes to fifteen or twenty, and the sleep from one to several hours. The duration of the whole paroxysm is generally from five to ten minutes; but often two or three attacks follow each other in such rapid succession, that the paroxysm seems to be protracted for several hours. Occasionally death takes place unexpectedly in the midst of the fit, either in consequence of injury inflicted on the brain by congestion of the cerebral blood-vessels, or by the suspension of the respiration through the spasm of the muscles of the larynx, which close the opening of the glottis so completely and for so long a time as to induce the state of asphyxia.

The disease differs according to the slightness or severity of the phenomena, in which there is every possible variety.

The return of the regular epileptic paroxysm is exceedingly various in different individuals. Several years may intervene between the seizure; or they may recur once every month, week, or day. In some instances, the paroxysms occur every week, on the same day; and occasionally every day, or night, at the same hour; but they most frequently come on when first falling asleep, and are often for a time unsuspected or overlooked.

Though the epileptic attack usually comes on suddenly, yet it sometimes gives distinct warning of its approach. The symptoms premonitory of an epileptic fit are analogous to those which precede an attack of apoplexy. [APOPLEXY.] But there is one peculiar sensation, termed the *aura epileptica*, of which many epileptics are conscious immediately before the fit. This consists of a feeling as if something were moving in some part of the limbs, or trunk of the body, and creeping thence upwards towards the head. Sometimes it is described as a sensation of a current of air, a stream of water, or a slight convulsive tremor; at other times no distinct idea can be given of the feeling, further than that it is a sensation of something moving along. This remarkable sensation does not appear to follow very distinctly the course of a nerve, but it seems to pass along the integuments. When it reaches the head, the patient is instantaneously deprived of sense, and falls down in convulsions. The sensation arises in different parts of the body, in the toe, foot, leg, and groin; in the finger, hand, and arm; at the bottom of the spine; in the uterus, loins, abdomen, and chest. But, in the great majority of cases, the attack of epilepsy is preceded by no such warning; and even where the premonitory symptoms do exist, the attack does not by any means always follow.

When the disease exists for a long time, it is frequently followed by insanity. It often terminates with an attack of apoplexy or paralysis.

Authors commonly divide epilepsy into two

species: first, idiopathic, where the disease depends on some primary affection of the brain, and, secondly, sympathic, in which it depends on an affection of some remote part, as the stomach, the liver, the bowels, the generative organs, the circulating system, &c. The state of the brain on which epilepsy depends is unknown. But many of the causes of the malady are well ascertained, and the knowledge of these is of great importance in the prevention and cure of the disease.

The exciting causes consist of two classes, those which act by exciting the energies of the brain, and those which act by depressing the brain. Those which act by over-stimulating the brain are mechanical, chemical, and mental stimulants, and the peculiar stimulus of over-distention: as sharp-pointed ossifications, arising either from the internal surface of the cranium or formed in the membranes of the brain; powerful mental emotions, such as joy and anger; congestion of the blood-vessels of the brain; suppressed discharges; violent exercise; too large a quantity of highly nutritious food or of stimulating drink.

But the very opposite causes, those which manifestly weaken the energy of the brain, occur in epilepsy, as hemorrhage, whether spontaneous or artificial; terror, horror, disgust; any powerful and disagreeable sensations, and especially certain disagreeable odours; excessive evacuations, great fatigue, inanition, and sedative poisons.

The medical treatment of a case of epilepsy must of course differ essentially according as it is idiopathic or sympathic, and connected with a plethoric and robust or debilitated and exhausted state of the system. When the appropriate remedies are judiciously employed, and the proper regimen is strictly adhered to, epilepsy is often permanently cured, and the suffering is greatly mitigated even in those forms of the disease which do not admit of cure.

A patient liable to epilepsy must not be permitted to ride nor to hold the reins in a carriage. The grates in all the apartments which he frequents ought to be guarded by a deep and strong fender: he ought to avoid the streets of a crowded city, in which the whirl of carriages, the tide of human beings, and the multiplicity and distraction of objects produce a vertiginous hurry of thought, which to him is ever dangerous. He ought not to walk near water.

If an attack of the disease come on while the patient is in his chamber, he ought immediately to be laid on his back on a bed, with an attendant standing on each side to prevent him from injury during the struggle. If he is much flushed, his head and shoulders ought to be elevated, the warmth of his extremities supported, while at the same time air is freely admitted into the room. All attempts to make him swallow or to stimulate the nostrils are improper. A medical practitioner ought to be sent for, and ought to remain in attendance while the struggle lasts. In a first attack, if the fit is severe, blood ought to be procured from the temporal artery, a precaution which will also be necessary in patients of an apoplectic diathesis, whensoever they labour under a prolonged fit of epilepsy.

(Cheyne, *Cyclopæd. of Pract. Med.*; Copland, *Dict. of Pract. Med.*; Prichard, *Diseases of the Nervous System*; Cooke, *Hist. and Method of Cure of the various Species of Epilepsy.*

EPILOGUE (*epilogus*), signifies, in Greek, a summing up, the end or peroration of a discourse. In English it is applied only to the short poems or copies of verses subjoined to new plays, and recited on the stage at their conclusion.

EPIME'DIUM, a genus of plants belonging to the natural order *Berberaceæ*, or *Berberideæ*. *E. alpinum*, Alpine Barrenwort, is a native of France and other parts of Europe in subalpine coppices and woods. *E. pinnatum* is a native of Persia, and *E. hexandrum* of the north-west of America. The first species is easily cultivated and will grow in any common garden soil, and may be propagated by dividing the root.

EPIME'NIDES was born in the year 659 B.C., in Crete. He passed his youth in solitary retirement. He went to Athens at the request of the inhabitants, in order to pave the way for the legislation of Solon by purifications and propitiatory sacrifices. These rites were calculated, according to the spirit of the age, to allay the feuds and party dissensions which prevailed there. Solon's constitution would hardly have been accepted had it not been recommended and sanctioned by some person who, like Epimenides, claimed from men little less than the veneration due to a superior being. The Athenians wished to reward Epimenides with wealth and public honours, but he refused to accept any remuneration, and only demanded a branch of the sacred olive-tree, and a decree of perpetual friendship between Athens and his own country, Cnossus in Crete, of which he was a citizen. Epimenedes visited Athens about 596 B.C., and died soon after his return to Crete. (C. F. Heinrich, *Epimenides aus Kreta*, Leipzig, 1801.)

EPINAL, the capital of the department of Vosges, in France, stands on the Moselle, 234 miles E. by S. from Paris, in 48° 10′ N. lat., 1° 47′ E. long., and has 11,012 inhabitants. The town is situated at the foot of the chain of the Vosges, and in a district abounding with delightful situations. The clear rapid stream of the Moselle, which here separates into two channels forming an island, divides the town into three parts: the Grande Ville, which stands on the right bank of the main stream, and at the foot of an eminence surmounted by the ruins of the castle; the Petite Ville, which is built on the island, and is joined to the Grand Ville by two bridges, one of stone built in 1841, and the other an iron suspension bridge; and the Faubourg of the Capuchins, which runs along the left bank of the smaller arm of the Moselle. The streets of Epinal are well built and clean. The finest edifices in the place are—the barracks, the prefect's residence, the college buildings, and the parish church; the former convent of the Capuchins, which stands on an eminence, and is surrounded by large gardens, is now used for an hospital. The town has a tribunal of first instance, a communal college, a chamber of commerce, a public library of 20,000 volumes, a museum, orphan asylum, and a theatre. The

manufactures are chemical products, lace, paper, and earthenware, block tin, hats, &c. There is also some trade in corn, cattle, iron, timber, oak-staves, deal planks, &c.

EPIPACTIS, a genus of plants belonging to the natural order *Orchidaceæ* or *Orchideæ*, and to the tribe *Limodoreæ* or *Arethuseæ*. There are two species of this genus found wild in Great Britain, *E. latifolia*, including *E. media*, *E. purpurata*, and *E. ovalis*. *E. palustris* is found in Great Britain in moist places, and is not a rare plant.

EPIPHA'NIUS, a Greek ecclesiastical writer, was born in a village near Eleutheropolis in Palestine, and lived during the latter half of the fourth century after Christ. He spent his youth in Egypt, where he joined the sect of the Gnostics. At the age of twenty he returned to Palestine, was instructed by Hilarion, became a monk, afterwards built a monastery near his native village, and was for a time at the head of it. In A.D. 368 he was made bishop of Constantia (formerly called Salamis) in Cyprus, the metropolis of the whole island. In A.D. 382 he was invited to Rome to give his vote in the case of Paulinus, bishop of Antioch. A few years after his return to Cyprus he became involved in a bitter and long protracted controversy with Joannes, bishop of Jerusalem, who was accused by Epiphanius of holding the heretical opinions of Arian and Origen. On a similar ground of dispute with Theophilus, bishop of Alexandria, Epiphanius went to Constantinople to gain the support of the Empress Eudoxia, but he there became involved in a quarrel with Chrysostom, and was forced to leave Constantinople without having succeeded. Epiphanius died on board ship while returning to Cyprus, in 402. He was then nearly one hundred years old, and had been bishop of Constantia for thirty-five years.

Epiphanius was the author of a considerable number of works, many of which have come down to us, but some of them are lost. The most important among the extant works are 1, 'Ancoratus' (Ἀγκυρωτός), that is, the anchor of faith against the heresies of the time, especially the Macedonian. 2, 'Panaria' (Πανάρια), that is, a repository of remedies against the eighty heresies which he enumerates. It consists of three books, and was commenced in A.D. 374, at the request of Acacius and Paulus. The author himself published an abridgment of this work under the title of Ἀνακεφαλαίωσις, which is still extant. The best edition of all the works of Epiphanius (the Greek original with a Latin translation) is that by Dionysius Petavius, Paris, 1622, 2 vols. fol., which was reprinted with some additions at Cologne, 1682, 2 vols. fol.

EPIPHANY, from the Greek Ἐπιφάνια (*Epiphaneia*), appearance, or manifestation, a church festival, celebrated on the twelfth day after Christmas, in commemoration of our Saviour's being manifested to the world by the appearance of a miraculous star. It is likewise denominated Twelfth Day. This day is said to have been first observed as a separate feast in the year 813. (Brady's *Clavis Calendaria*, London, 1812; Brand's *Popular Antiq.*)

EPIPHE'GUS, a genus of plants belonging to the natural order *Orobanchaceæ*. There is but one species, the *E. Virginiana*. It is found parasitical on the roots of beech-trees, in the southern States of the American union, where it is called 'Beech Drops.' It is the *Orobanche Virginiana* of Linnæus. The corolla is purple, streaked with white. The capsule dilates after it opens into the shape of a cup.

EPIPHYTES are plants found growing upon other vegetables, adhering to their bark and rooting among the scanty soil that occupies their surface, in which respect they are distinguished from parasitical plants, which, like Mistletoe and the various species of Loranthus, strike their abortive roots into the wood, and flourish upon the blood of the individual to which they attach themselves. In this sense of the word, mosses, lichens, ferns, and plants of many other families, are epiphytes; but as in this country at the present day the word is principally employed with reference to those *Orchidaceæ* which grow upon trees, it is to plants of that description that we propose to devote the present article.

It had long been known, from the reports of travellers, that orchidaceous epiphytes were plants of extremely curious organization, and that great numbers were also remarkable for the singular beauty and fragrance of their flowers; but when imported into this country, their habits were found to be so unlike those of other plants, that no gardener could succeed in keeping them even alive for any considerable time, except in a very few instances; and it was not till about the year 1820 that the real method of managing them successfully began to be understood. Since that period the difficulties of cultivating orchidaceous plants have been gradually disappearing, and at the present day they may be said to be almost entirely overcome.

We do not propose in this place to give any botanical account of these curious plants; for such particulars we refer to the article on ORCHIDACEÆ.

Orchidaceous epiphytes grow naturally upon trees in the recesses of tropical forests. They establish themselves upon the branches, and either vegetate amidst masses of decayed vegetable and animal matter, or cling by their long succulent grasping roots to the naked branches of trees, from which and the humid atmosphere together they exclusively derive their food. It appears from the testimony of Mr. Henchman that they are never found upon dead erect trees in forests; but if upon dead wood at all, then only upon fallen trunks, which, from their situation near the ground, are constantly damp. Such situations are however said to be by no means favourable to their growth. They will also flourish upon rocks and stones in hot and damp climates. We even see some of them germinate and grow most luxuriantly in damp places, in the stove, upon the sides of the garden-pots, and among gravel; some genera, such as *Brasavola*, are even reported to prefer stones. In the botanic garden at Calcutta they are cultivated with success in raised beds of solid brickwork, so contrived as to insure a perfect drainage; the soil being rich vegetable matter mixed with at least two-thirds small pebbles,

and covered with a dense layer of moss. A certain quantity of shade seems, in many cases, essential to them, their natural situation being in forests, or among the branches of growing trees. In Brazil numbers of them occupy damp woods and rich valleys, among vegetation of the most luxuriant description, by which they are embowered.

In Nepaul Dr. Wallich states that orchidaceous epiphytes grow in company with ferns; and the thicker the forest, the more stately the trees, the richer and blacker the natural soil, the more profuse the orchidaceæ and ferns upon them. There they flourish by the sides of dripping springs, in deep shady recesses, in inconceivable quantity, and with an astonishing degree of luxuriance. It would however be a great error to suppose that it is only in very shady places that orchidaceous epiphytes appear. On the contrary, it is probable that the cases just cited are extreme, and that they more commonly prefer situations where the broken rays of the sun can readily reach them.

Where the climate suits them, they are sometimes prodigiously numerous. Descourtilz, in his manuscripts, speaks of a whole tree being overrun with a single species; and Henchman also assures us that in Demerara masses of *Oncidium altissimum* and *Maxillaria Parkeri* are to be seen, which would defy any attempt at intrusion. On the Spanish Main he saw the epiphyte commonly called the Spread Eagle, which will possibly prove an epidendrum, clasping enormous trees, and covering them from top to bottom; and he also met with two or three species, supposed to be *Maxillarias*, which were growing with uncommon vigour.

Upon comparing the orchidaceous plants of Java, of Ceylon, and of the Burmese country, it is quite extraordinary how few species those countries possess in common. Mr. Bateman assures us that in Guiana 'a river may be ascended for 20 miles without an orchidaceous plant being seen; while, on a sudden turn of the stream, every tree becomes covered with them.' The part of the tree on which they are principally found is as uncertain as their station. In some places they are seen swinging from the loftiest branches; in other places, at seven or eight feet from the ground. It may be also observed that rough and soft barked trees are favourite habitations of orchidaceæ. The calabash tree, which has a peculiarly soft and woolly bark, often possesses many of the more minute species.

A high mean temperature throughout the year, and a climate either constantly humid or at least periodically so, are also atmospheric elements eminently favourable to the production of these plants. All those species which simply exist by clinging by their roots to the branches of growing trees, and probably others also, must necessarily derive their nourishment in a great measure, if not entirely, from the moisture, in a very elastic state, that surrounds them. And although nature seems in general to have provided for the scantiness of their food by the construction of them with a cuticle only capable of parting by slow degrees with the fluid they receive by their roots, yet it is obviously requisite that they should be so situated as to be within reach of an abundant supply, not only at the time when they are growing, but also at all other times to a certain extent. Hence we find that the hottest countries if dry, and the dampest if cold, are destitute of them, while there is no instance of a country both hot and damp in which they are not plentiful. For example, in Africa, they are unknown in its sandy deserts and parched atmosphere, notwithstanding the high temperature of that part of the world; yet they abound in Sierra Leone, where the climate is damp, and even at the Cape of Good Hope they occur not unsparingly in all that jungly district to the eastward of Cape Town. In the West India Islands they exist in great quantities, particularly in Jamaica and Trinidad, not however so much on the coast as upon the lower ranges of hills. At Rio Janeiro the mean temperature is 74° 3′, and much higher inland; the woods are so damp that it is difficult to dry plants; and in such situations multitudes of orchidaceous epiphytes spring up. But in the immediate vicinity of Buenos Ayres, where the mean temperature is 67° 6′ and the air dry, they are unknown. No country however exhibits in a more striking manner than India the necessity of a hot and damp climate for the production of orchidaceous epiphytes. In the Malayan Archipelago, the mean temperature of which is estimated at between 77° and 78°, and is very damp, they are found in profusion. In Nepaul it is upon the sides of the lower mountains that they occur, where they vegetate amongst clouds and constant showers; while on the continent of India they are almost unknown.

Such are the more important data that we possess to guide us in the cultivation of orchidaceous epiphytes: the result of which is, that they are kept in this country in stoves, the air of which is maintained in a state of constant moisture, and at a temperature varying from 56° to 90° or more. The requisite uniformity of their atmosphere is provided for by keeping the houses but little ventilated, and the glass of the roof well puttied at the junction of the squares. Shade is secured either by moveable laths or by a screen of netting or coarse canvass, or by some such contrivance; some even grow their plants in a house exposed only to the north: but it does not appear that this plan is a good one; for it is an object not only to exclude excessive light, but also to be able to admit it if requisite, and this cannot happen in a hothouse with a northern aspect.

The soil in which the plants are made to grow is peat or some other kind of decayed vegetable matter, thoroughly drained, and yet so compact as not to be liable to become dry by excessive loss of water. In many cases it is found advantageous to make the plants grow upon the apex of a truncated cone of earth rising several inches above the rim of the pot. Certain kinds are suspended in baskets, or in frames so contrived as to be filled with moss and decayed vegetable mould rammed in very tight; and provided that precaution is attended to, the caulescent drooping species, especially Dendrobiums and Vanda-like plants,

thrive admirably; but in general it is found most advisable to plant in earth in common garden-pots. Attempts have been made to grow some species on decayed dead wood, but they are generally abandoned now; nor have the trials to cultivate them on the branches of living trees hitherto proved more successful.

By attending to the natural habits of these plants, and observing the precautions just pointed out, the management of orchidaceous epiphytes has been brought quite within the skill of any good gardener. There are however two or three capital points about which cultivators entertain great difference of opinion.

The first is temperature. Some allow the thermometer to rise to 100° and higher in a summer's day, and never suffer it to fall below 65°; the consequence of which is, that their houses are so unpleasant that few persons can visit them to inspect the beautiful objects they contain. Others keep the temperature of even midsummer down to 80° at the most, and permit the minimum heat to be low in proportion: their houses are consequently cool and pleasant at all times. If we must admit that the first practice is eminently successful with some, so is the other most assuredly so with others, and we entertain no doubt that in the end it will be the only method followed.

The second question is the amount of moisture. Some form water tanks in their houses, the evaporation from the surface of which keeps the air continually at the point of saturation; others simply keep the air sensibly moist, by syringing or similar devices; the first is accompanied by a high, the latter by a moderate, temperature; in this case also we incline to believe that the latter practice is the best. The fact is that it may be reasonably doubted whether it is right always to follow nature literally in what we suppose to be her practice, and whether we ought not rather to adapt the management of our plants to the new and artificial condition under which they are placed.

The third unsettled point is of another nature. In our hothouses we often maintain a high temperature all the year round, keeping our stove-plants growing from January to December. In nature this hardly ever happens. If a country has no winter, it has its dry season, during which plants become more or less torpid. This is quite the case in all the countries inhabited by orchidaceous epiphytes, with the exception of some of the temperate parts of Mexico, where the climate is equal and mild. Should we not therefore give such plants, when cultivated, a similar period of repose?

EPIRUS (*Ἤπειρος*, mainland), a name given to that district in Northern Greece which extended from the Ceraunian mountains on the north to the Ambracian gulf on the south, and from the Ionian sea to the chain of Pindus. The ancient geography of Epirus was attended with great difficulties even in the time of Strabo. The country had not then recovered from the effects of the destruction caused by Paulus Æmilius, in 167 B.C., who destroyed seventy towns, and reduced to slavery 150,000 of the inhabitants (Liv., xlv. c. 34; Plut. 'Æmil.,' c. 29), after which the greater part of the country remained in a state of desolation, and where there were any inhabitants, they had nothing but villages and ruins to dwell in. The inhabitants of Epirus were scarcely considered Hellenic. The population in early times had been Pelasgic. The oracle at Dodóna was always called Pelasgic, and many names of places in Epirus were also borne by the Pelasgic cities of the opposite coast of Italy. Theopompus (Strab., p. 323) divided the inhabitants of Epirus into fourteen different tribes, of which the most renowned were the Chaonians and Molossians, who successively maintained a preponderance. Of the other Epirotic nations, the Thesprotians are most frequently mentioned. The Chaonians occupied the northern part of Epirus, the Molossians the southern, and the Thesprotian territory lay in the middle. The most celebrated cities in Molossia were Ambracia and Nicópolis. Ambracia was a Corinthian colony, founded about 650 B.C. Nicopolis was founded by Augustus to commemorate his victory at Actium. The ruins of Nicopolis are very extensive. (Hughes's 'Travels,' ii. p. 412.) The modern Albania corresponds in part to Epirus.

EPISCOPACY. [BISHOP; BISHOPRIC.]

EPISCOPIUS, SIMON (whose real Dutch name was *Bisschop*), was one of the most learned men of the 17th century, and the chief supporter of the anti-calvinistic doctrines advocated by his contemporary Arminius. He was born in the year 1583, at Amsterdam. In 1600 he went to the university of Leyden, of which he became a distinguished member, and entered with zeal and great ability into the predestinarian controversy between the Arminians and Gomarites. He was ordained in 1610, as the minister of the village of Bleyswyck, near Rotterdam, and in the following year he was deputed to the office of Arminian advocate at the conference held at the Hague between the Remonstrants and their opponents, the Calvinists. It is a proof of the acknowledgment of his superior theological learning that he was chosen to fill the chair of professor of divinity in the university of Leyden, as the successor of the celebrated Professor Gomar, whose doctrinal theory he had powerfully opposed. The predominant party of Calvinists, or Gomarites, treated him with great injustice at the synod of Dort, to which he went as a deputy from the states of Holland. He was refused a hearing in behalf of the less numerous party of Arminians, and finally he and his party were expelled from the synod, and were subsequently deposed from the functions of the ministry and banished from the territory. Episcopius retired to France, where he continued to write in defence of Arminianism. In 1626, when sectarian animosity had somewhat subsided, he returned to Holland, and became the minister of the church of Remonstrants at Rotterdam. Finally, he was made rector of the college founded by the Remonstrant party at Amsterdam, where he died, in 1643. His works were published collectively in 2 vols. fol., entitled 'Opera Omnia Theologica,' &c., Curcellæi edita, Amsterdam, 1650, 1665, and 1671; and in London in 1678.

The highest eulogiums have been bestowed on the abilities of Episcopius by Le Clerc, Mabillon, Grotius, Bishop Bull, and many other eminent scholars of different sects. In England he was closely imitated by Dr. Hammond and Archbishop Tillotson.

(*Life of Episcopius*, by Limborch, and by Curcellæus; *Life and Death of Arminius and Episcopius*, London, 1672, 12mo.)

EPISODE (ἐπεισόδος *epeisodos*). The Greek word *eisodos*, the principal member of this compound, when applied to the drama, means an entrance of the chorus on the stage; *epeisódion*, that part of a play which lies between two choral songs; and as these recitations had, in the rude beginning of the Greek drama, no connection with the choral part, which they were introduced to relieve, the word, with its derivative Latin form, comes to signify a thing connected with, but not essential to, that of which it is part—which may be taken out and leave a perfect work;—as, for instance, the Catalogue of Ships, in the 'Iliad,' or the War in Heaven, in 'Paradise Lost.' Episodes should grow naturally out of the subject; and when judiciously used, they relieve and diversify the main narration.

EPISTAXIS (from ἐπίσταξις, a dropping, bleeding of the nose) is the term used by most nosologists to indicate bleeding from the nose, which essentially consists in an effusion of blood externally from the pituitary membrane. Blood may flow from the nose under very varying circumstances; sometimes when the system is in a state of plethora, and at others when in a state of debility. When it occurs in plethoric persons it is usually preceded by pain in the head, vertigo, or drowsiness, frightful dreams, increased heat of one side of the face, injection of the eyes, flashes of light before the eyes, increased beating of the temporal arteries, deafness, &c. Where the bleeding comes on in a state of debility, it is called passive, and may make its appearance without any premonitory symptoms. This form comes on in the course of low and malignant fevers, and various diseases which come on in a cachectic state of the body.

Bleeding at the nose, when it occurs alone, most frequently comes on in children. After ten or twelve years of age it is oftener seen in boys than girls. It is frequently hereditary, and whole families exist who are liable on slight causes to bleed at the nose. It may be brought on by whatever increases the flow of blood to, or retards the flow of blood from, the head.

Bleeding at the nose is not in itself dangerous. It may however come on in states of the body when the system is already exhausted, and be the forerunner of a fatal result.

In the treatment of bleeding from the nose regard must be had to the state, age, &c., of the patient. When it occurs in children, and in the great majority of simple cases, all that is required is to make the patient assume the sitting posture, and hold the head backwards; cold should be applied to the face, and a piece of cold metal placed between the nape of the neck and the clothes. Acid drinks may be given at the same time. When the person is plethoric and has suffered much pain in the head, singing in the ears, &c., previously, it will not be advisable to stop the bleeding until these symptoms are relieved. This may be followed by the exhibition of purgatives; and bleeding from the arm should be had recourse to if the head symptoms continue.

EPISTYLE, the first layer of stone placed on columns to form the architrave. The term is derived from the Greek epistylium (ἐπιστύλιον), and that from the words *epi* (ἐπί) 'upon' and *stylus* (στῦλος), 'a column.'

EPITAPH (ἐπιτάφιον, *epitáphium*), an inscription on a tomb; from ἐπί, upon, and τάφος, a sepulchre. Inscriptions in honour of the dead are perhaps as old as tombs themselves; the most ancient however with which we are now acquainted are probably those of Simonides upon Megistias the soothsayer of the little army of Leonidas, and on the heroes who fell at Thermópylæ, preserved by Herodotus (vii. 228). Another epitaph of very high antiquity may be referred to in the ancient Greek inscription found in the Ceramicus at Athens, upon the warriors who fell at Potidæa 432 years B.C. The original, in a mutilated state, is among the Elgin marbles in the British Museum.

The earliest epitaphs of this country were those of the Romans or Romanized Britons, which usually begin with D. M. (*Diis Manibus*), followed by the name, office, and age of the deceased, and a conclusion which informed the reader by whom or through what means the inscription was erected.

Whether the Saxons or the Danes used monumental inscriptions among us, either in their own or in the Latin tongue, has been doubted. The few which we have for the people of the Saxon times are the compositions of a later date.

The regular series of English epitaphs begins in the 11th century, when they were still written in the Latin language, and abundant examples exist from that time to the present.

Collections of epitaphs, ancient and modern, are numerous; there are many of great merit in the Greek Anthologia. A very large collection of epitaphs will be found in 'Theatrum Funebre, exhibens per varias scenas Epitaphia nova, antiqua, seria, jocosa, &c., in quatuor partes distinctum, extructum a Dodone Richea (seu Ottone Aicher),' 4to., Salisburgi, 1675; Hacket's 'Select and Remarkable Epitaphs on Illustrious and other Persons,' 2 vols. 8vo., 1757, is probably the best English collection.

EPITHALA'MIUM (ἐπιθαλάμιον, from ἐπί, 'at' or 'near,' and θάλαμος, 'chamber,' especially that of a new-married couple), a poem composed in honour of a marriage. It was sung by youths and maidens conjointly, at the door of the bridal chamber, after the bride and bridegroom had entered, and also before they rose in the morning. The most remarkable extant are those of Catullus, who has left three beautiful specimens of this sort of composition. That on the marriage of Peleus and Thetis, which is probably only a fragment, is one of the most beautiful specimens of Latin poetry.

EPOCH. (Astronomy.) This term is fre-

quently applied to signify, not a moment of time, but the longitude which a planet has at that moment of time. In order to predict the longitude of a planet at any epoch, some preceding epoch must be taken, at which the longitude is known. This latter is especially called the epoch; and the term *longitude at the epoch* has been abbreviated into *epoch*.

EPODE (in Greek ἐπῳδὸς, *after-song*, from ἐπὶ, 'on' or 'upon,' and ᾠδὴ, 'song') is one of the three divisions of the Greek ode. The performers in singing it stood still. It was not, like the strophe and antistrophe, symmetrical with another member of the ode; so that the poem was unfettered as to its length and as to the choice of measures. The epode, however, is not essential to an ode: many of the Greek choruses have none. Most of Pindar's odes, on the contrary, have an epode interposed between each antistrophe and the following strophe. Epode, according to the grammarians, is also a metrical term given to those measures in which a short verse follows a long one, of which the former is called *proodic*, the latter *epodic*. Hence the fifth book of Horace's Odes is called the Book of Epodes, because nearly all of them are written in that sort of measure.

EPPING. [Essex.]

EPROUVETTE is an apparatus consisting of a gun or mortar suspended from a horizontal axis for the purpose of determining the strength of gunpowder by the recoil of the piece when a charge is fired in it. Mr. Robins ('New Principles of Gunnery') first proposed the employment of such a machine, but Dr. Hutton, of Woolwich, afterwards considerably improved its construction.

The velocity acquired by a body on describing half a vibration in a circular arc varies (by mechanics) with the square root of the vertical height, or with the chord of the half vibration: hence, if by the explosions of equal charges of different kinds of powder in a suspended gun, the latter be made to recoil from a vertical position through arcs or angles which are measured in degrees, the velocity resulting from the force which produced the recoil being equal to that which the gun would have acquired in descending by gravity from the upper extremity to the lowest point of the arc; it follows that the chords of those arcs or angles will express the relative velocities produced by the different kinds of powder. Again, by mechanics, the forces are as the squares of the velocities; and these, when produced by a body descending on circular arcs, are as the versed sines of the arcs; therefore the angles of recoil, or the half vibrations, being found from the experiments, their versed sines will express the relative forces of the different kinds of powder.

A gun suspended in the manner above described has been employed, instead of the ballistic pendulum, to determine, by its recoil, the initial velocity of the shot fired from it with a given charge of powder. [Ballistic Pendulum.]

EPSOM. [Surrey.]

EPSOM SALTS. [Magnesia.]

EPSOMITE (*Sulphate of Magnesia*) occurs massive, botryoidal, and reniform, on the surface of other bodies, and in solution in sea and mineral waters. Colour white. Structure fibrous. Taste bitter and saline. Found originally in the spring at Epsom. It forms a large bed near Arequipa in Peru, and is often in fine crystals and silky fibres.

EPWORTH. [Axholme, Isle of.]

EQUAL. Two magnitudes are equal when one of them may be made to coincide with the other. This is the geometrical definition of Euclid, and is placed by him among the axioms, though in reality it is nothing more than the definition of the word equal.

EQUALITY, APPROACH TO. As a general rule, that which may be stated as absolutely true when an equation is true, may be stated as nearly true when that equation is only nearly true. Usage of words however is apt to lead to mistake when it is equality, and nearness to equality, which are in question: A and B are absolutely equal when either of the following equations is true; one of them being of course a consequence of the other:

$$A-B=0 \qquad \frac{A}{B}=1$$

and it is usual to say that a *small* quantity is *nearly nothing*, or *near to nothing*. In strictness, we might as well say that a large quantity is near to infinity, as that a small quantity is near to nothing: both infinity and nothing are limiting terms, except only as to the latter, when obtained by subtraction. Nevertheless we can hardly hope to abolish the common idea of small quantities being next to nothing. We must therefore guard those who accept this phraseology from the mistake to which it very frequently leads.

It is not true that quantities are necessarily nearly equal when their difference is near to nothing (meaning small). If by small we here understand small with respect to the quantities themselves, it is true; but not otherwise. If A−B be a small fraction of A, let it be mA, where m is a small fraction of unity; then A−B=mA gives

$$\frac{B}{A}=1-m$$

or B and A are in the ratio of 1−m to 1, nearly that of 1 to 1. But if A and B be both small, their difference is small: and yet that difference may be itself many times greater than the smaller of the two quantities from which it was obtained. If the bulk of the sun be unity, the earth and moon are both small fractions; but not nearly equal. When therefore we want to think of approach to equality, we must rely on approach to

$$\frac{A}{B}=1, \text{ not to } A-B=0.$$

EQUATION (in pure mathematics), an assertion of the equality of two magnitudes, represented to the eye by the symbol =. Thus A=B is to be understood as a proposition, declaration, or assertion that the magnitude A is equal to the magnitude B. It is not immaterial to insist upon this definition; for beginners frequently confound the notion of an equation (an *assertion* of equality)

with the idea of equality itself, and speak of two *equations* being *equal*, or of multiplying or dividing an *equation*.

To treat of equations is to write on mathematics in general; for when two magnitudes A and B are of the same kind, A must be either greater than, equal to, or less than B. The objects of mathematics generally require that it should be determined (supposing A and B not equal) by how much one exceeds the other: and the assertion that A exceeds B, and exceeds it by M, is equivalent to the *equation* $A=B+M$. The assertion of inequality is called by some continental writers an *inequation*.

An equation may be one of two kinds: necessarily true, whatever may be the value of the symbols employed, and called *identical*; or true only upon the supposition of some particular value being given to certain magnitudes, or of some particular relations existing. The latter species are called equations of *condition*. Thus—

$a=a$, $a+a=2a$, $(a+b)^2=a^2+2ab+b^2$

are identical equations: while

$2a+1=13$, $x^2=5x-4$

are equations of condition; the first requiring that a should be 6, and the second that x should be either 4 or 1. Again, $a+b=1$ is an equation of condition.

EQUATION, BINOMIAL. A binomial equation is an algebraical equation of two terms. Its form is therefore $ax^n+bx^m=0$, all the consideration of which may easily be reduced to that of one or other of the forms $x^n \pm a^n=0$ (n being integer), at least if we confine ourselves to equations in which the data are all real quantities.

EQUATION. (Astronomy.) The characteristic of all the heavenly motions is, that they nearly follow a simple law, but not quite. The small corrections which must be added to or subtracted from the results of the simple law, in order to secure accurate prediction, are called equations. Thus, the moon moves round the earth with a motion which is not very far from uniform; the average motion is therefore ascertained, and starting from a given epoch, at which the true place is known, the longitude for that epoch is first increased by the longitude which would have been described by the moon, had she moved with her average motion. The result must then be altered by a number of different equations, some being consequences of the elliptic figure of the moon's orbit, some of the sun's attraction, &c. When all these equations have been annexed, the result is the moon's longitude for the time proposed.

EQUATION OF A CURVE is any equation between COORDINATES (usually rectangular ones) which is true at all points of the curve.

EQUATION OF PAYMENTS, an arithmetical rule, for the purpose of ascertaining at what time it is equitable that a person should make payment of a whole debt which is due in different parts payable at different times. This rule is now of no practical use.

EQUATION, PERSONAL. It is a fact which has now been for some years established, and which might reasonably have been suspected, that different persons, attempting to observe the precise moment of a phenomenon, by means of a clock which beats seconds, do not agree exactly in their results, but differ generally in one and the same way, one of the observers being almost always a little before the other in the moment which he assigns to the phenomenon. If this had not been the case, if one of the observers had been about as often before the other as behind him, the difference could only have been considered as simple casualty. But, looking upon the constant occurrence of a diffence of one kind between two observers, it becomes obvious that the cause is in the organs of the men themselves; and that physical constitution, temperament, habit, &c., make differences between one person and another.

Personal equation is a name given to the quantity of time by which a person is in the habit of noting a phenomenon wrongly; and it may be called positive or negative, according as he notes it after or before it really takes place. Thus if A and B are severally in the habit of noting events 3-tenths of a second after and 4-tenths of a second before they take place, their personal equations may be described as being $+\ 0^s{\cdot}3$ and $-\ 0^s{\cdot}4$.

The first notice we have of personal equation is an announcement by Maskelyne, in the volume of Greenwich Observations for 1795. He tells us that he was obliged to part with one of his assistants, because the latter, who had till then always agreed with him in his observations, suddenly began, in August, 1794, to observe half a second later: and that in January, 1796, the difference amounted to 8-tenths of a second. The phenomenon has since been attended to, and is now always looked for and provided against.

EQUATIONS, DIFFERENTIAL, and EQUATIONS of DIFFERENCES, are equations in which the difficulty of solution arises from the entrance of differential coefficients or differences of a function, the connection of which with its variable is unknown.

EQUATIONS, FUNCTIONAL. In this case the question is to find the form of a function which will satisfy certain conditions.

EQUATOR and ECLIPTIC, the two principal circles of the sphere. The first is that circle of the apparent celestial sphere which is in all points equally distant from both poles; the second, the circle through which the sun appears to move. The equator is so called from being the circle on the arrival of the sun at which the day and night become equal. The ecliptic derives its name from being the circle on which (or near which) the moon must be in the case of an eclipse.

EQUATORIAL CURRENT. [ATLANTIC OCEAN.]

EQUATORIAL INSTRUMENT. This name is generally given to astronomical instruments having their principal axis of rotation in the direction of the poles of the heavens. When the purpose of a machine of this nature is simply to carry a telescope, it has been called a *machine parallactique* or *parallatique* by the French, and sometimes *Polar Axis* by English writers. For a full account of the instruments to which this name is applicable, and their uses, see 'Penny Cyclopædia.'

EQUERRIES (from the French *écurie*, a stable), the name given to certain officers of the household of the Queen of England, and in those of some other members of the royal family.

EQUIANGULAR, EQUILATERAL, EQUICRURAL, EQUI-TANGENTIAL, &c., &c., a class of words beginning with *Equi*, which, in composition forms an adjective expressive of the equality of two things spoken of. Thus Equiangular means having equal angles, and so on.

EQUILI'BRIUM (*æqua libra*), a state of rest produced by the mutual counteraction of two or more forces. The science of equilibrium is STATICS.

EQUIMULTIPLES, multiples in which equal numbers of times are taken. Thus *seven* times A and *seven* times B are *equi*-multiples of A and B.

EQUINOCTIAL, a name given to the equator, from the night being equal to the day when the sun is there.

EQUINOXES, the intersections of the equator and ecliptic; the vernal equinox being that in which the sun is when about to rise into the northern hemisphere; the autumnal equinox being that in which the sun is when about to sink into the southern hemisphere. These terms are relative; for the equinox which is vernal in our hemisphere is autumnal in the southern, and *vice versâ*.

EQUISETA'CEÆ are imperfectly formed plants whose real affinity is uncertain, and the nature of whose parts of fructification is not yet understood. By Linnæus and almost all botanists they are referred to the Cryptogamic class; by a modern English botanist they are regarded as a low rudimentary form of *Gymnosperms*. Only one genus is known, the stems of which are employed in the shops under the name of Dutch Rushes. They are hollow-stemmed leafless plants, with a cuticle composed of pure silex, which gives them the hard surface that makes them useful for the polisher's purpose. *Equisetaceæ* are in English called Horse Tails, and are reckoned a sure sign of wet, stiff, springy soil.

EQUISE'TIC ACID exists combined with magnesia in the *Equisetum fluviatile*. It forms small colourless radiating crystals, having a sharp taste. It combines with most of the alkalies to form salts.

EQUISE'TUM, a genus of plants, the type and only genus of the order *Equisetaceæ*. *E. hyemale*, Dutch Rush, has a simple stem, very rough, with from 14–20 slender furrows. It is a native of England, Scotland, and Ireland, as well as the continent of Europe; but is almost unknown in the middle and southern English counties, and is only sparingly distributed anywhere. It appears to possess tannin, and to act as an astringent. It is supposed to be injurious to cows, and is said to cause their teeth to drop out, but horses eat it with impunity. This plant, more than any other species, is used for the purposes of polishing. Lightfoot says, that in Northumberland the milk-maids scour their pails with it. It is also used for the purposes of polishing wood, bone, ivory, and various metals, particularly brass, and is brought into this country from Holland, where it grows abundantly, and is sold in the shops of London under the name of Dutch Rush.

E. Mackaii is found in Ireland. *E. variegatum*, on sands near the sea, or wet places in Britain. *E. palustre* is very generally distributed over Great Britain. It is liable to alter its characters, and three tolerably permanent varieties have been described. *E. fluviatile*, Water Horse-Tail, is the *E. Telmateia* of Ehrhart and Newman's 'History of British Ferns.' It is one of the most beautiful of the species, attaining a height of three, four, and even five feet. It is abundant in the neighbourhood of London, especially near Hampstead Heath. It is a native also of the more southern countries of Europe. Although it grows in water, as its name would imply, it still grows in dry situations; and the name *fluviatile* is more applicable to the original plant of Linnæus, the *E. limosum* of English botanists. *E. limosum* is seen very commonly in ponds and ditches, and sometimes in running streams, the roots and a portion of the stem being immersed in water. It is a common plant throughout Europe. Linnæus says that in Sweden it is used as food for cattle, in order that cows may give more milk, and also that the reindeer feed on it. He advises that it should be collected in summer as fodder for the winter. Cattle in this country will sometimes eat it. *E. sylvaticum*, Wood Horse-Tail, is found in wet shady places and moist woods throughout Great Britain. *E. Drummondii* has not been long known as a native of Great Britain, but it is probably identical with the *E. umbrosum* of Willdenow. *E. arvense*, Corn-Field Horse-Tail, is the most common of all the species, and frequently a source of serious injury to the farmer and gardener.

E'QUITES (horsemen), the name of an order in the Roman state. The equites were originally a class of men who served on horseback: there were said to be, in the earliest periods of Roman history, three centuries or bodies of equites, but all that relates to the origin of the equites is very obscure. Tarquinius Priscus is said to have established three more centuries.

When Servius Tullius established the comitia of the centuries, he added twelve other equestrian centuries. To the establishment of the comitia centuriata the creation of a body of equites, as a distinct order, seems to be due. According to the Servian constitution, good birth or the sanction of the censors was necessary for gaining a place in the equestrian order. (Polyb., vi. 20; Zonaras, vii. 19.)

It appears probable that a certain sum was fixed which it was not necessary for every eques to have, but the possessor of which was obliged to serve on horseback at his own expense if no horse could be given him by the public, and that those whose fortune fell short of this were obliged to serve in the infantry under the same circumstances.

The lieutenant of the dictator was called 'the master of the equites' (*Magister Equitum*); and in later times he was appointed to this office by the dictator himself.

With regard to the functions of the equites, besides their military duties, they had to act as judices or jurymen in certain kinds of trials, under the Sempronian law: under the Servilian law the

judices were chosen from the senate as well as from the equites; by the Glaucian law the equites alone performed the office: and so on by alternate changes till the law of Aurelius Cotta (B.C. 70), by which the judices were chosen from the senators, equites, and tribuni ærarii. The equites also farmed the public revenues. Those who were engaged in this business were called the *Publicani* (the Publicans of the New Testament).

The equites gradually lost the marks of their distinctive origin, and became, as they were in the time of Cicero for instance, an ordo or class of persons as distinguished from the senate and the plebs. They had particular seats assigned to them in the circus and the theatre. The insignia of their rank, in addition to the horse, were, a golden ring and the angustus clavus, or narrow band, on their dress, as distinguished from the latus clavus, or broad band, of the senators: the two last insignia seem to have remained after the former ceased to possess its original character.

EQUITY. That branch of English law which is expressed by the term Equity consists of certain rules and principles which are applied in the Court of Chancery to the determination of those cases which fall within its jurisdiction.

In its enlarged sense, Equity answers to the definition of justice, as given in the 'Pandect' (i. tit. 1, s. 10, 11). But in this sense every court is a court of equity, because it does and must recognise the universal principles of justice. But Equity, the subject of this article, has a limited and a technical meaning.

It is hardly possible to define Equity as now administered in England and Ireland, or to make it intelligible otherwise than by a minute enumeration of the matters cognizable in the courts in which it is administered in its restrained and qualified sense.

The remedies for the redress of civil wrongs and for the enforcement of rights are distinguished into two classes, those which are administered in Courts of Law, and those which are administered in Courts of Equity. Accordingly rights may be distributed into legal and equitable. Equity jurisdiction may therefore, as already stated, be defined as that department of law which is administered by a court of equity as distinguished from a court of law, from which a court of equity differs mainly in the subject matters of which it takes cognizance and in its mode of procedure and remedies.

Courts of common law proceed by certain forms of action alone, and give relief only according to the kinds of actions, by a general and unqualified judgment for the plaintiff or the defendant. There are many cases however in which a simple judgment for either party will not do entire justice. Some modifications of the rights of both parties may be required; some restraints on one side or the other, or on both. Some qualifications or conditions ought to be annexed to the exercise of rights or the redress of injuries. To accomplish such objects the courts of law in this country have no machinery: according to their present constitution they can only adjudicate by a simple judgment between the parties. Courts of equity however are not so restrained; they adjudicate by decree pronounced upon a statement of his case by the plaintiff, which he makes by a writing called a Bill, and the written answer of the defendant, which is given in upon oath, and the evidence of witnesses, together, if necessary, with the evidence of all parties, also given in writing and upon oath. These decrees are so framed as to meet all the exigencies of the case, and they vary, qualify, restrain, and model the remedy so as to suit it to mutual and adverse claims, and the substantial rights of all the parties, so far as such rights are acknowledged by the rules of equity.

The courts of equity bring before them *all* the parties interested in the subject matter of the suit, and determine the rights of all, however numerous. Courts of law are compelled by their constitution to limit their inquiry to the litigating parties, although other persons may be interested; that is, they give a complete remedy in damages or otherwise for the particular wrong in question as between the parties to the action, though such remedy is in many cases an incomplete adjudication upon the general rights of the parties to the action, and fails altogether as to other persons, not parties to the action, who may yet be interested in the result or in the subject matter in dispute.

The description of a court of equity, as given by Mr. Justice Story, in his 'Treatise on Equity,' is this. A court of equity has jurisdiction in cases where a plain, adequate, and complete remedy cannot be had in the common-law courts. The remedy must be plain, for if it be doubtful and obscure at law, equity will assert a jurisdiction. It must be adequate, for if at law it falls short of what the party is entitled to, that founds a jurisdiction in equity; and it must be complete, that is, it must attain the full end and justice of the case; it must reach the whole mischief and secure the whole right of the party present and future, otherwise equity will interpose and give relief. The jurisdiction of a court of equity is sometimes concurrent with the jurisdiction of the courts of law; sometimes assistant to it; and sometimes exclusive. It exercises concurrent jurisdiction in cases where the rights are purely of a legal nature, but where other and more efficient aid is required than a court of law can afford. In some of these cases courts of law formerly refused all redress, but now will grant it. For, strict law comprehending established rules, and the jurisdiction of equity being called into action when the purposes of justice rendered an exception to those rules necessary, successive exceptions on the same grounds became the foundation of a general principle, and could no longer be considered as a singular interposition. Thus law and equity are in continual progression, and the former is constantly gaining ground upon the latter. Every new and extraordinary interposition is by length of time converted into an old rule; a great part of what is now strict law was formerly considered as equity, and the equitable decisions of this age will unavoidably be ranked under the strict law of the next. (Prof. Millar, 'View of the Eng. Govt.') But the jurisdiction having been once acquired at a time when there

was no such redress at law, it is still retained by the courts of equity.

The most common exercise of the concurrent jurisdiction is in cases of account, accident, dower, fraud, mistake, partnership, and partition. In many cases which fall under these heads, and especially in some cases of fraud, mistake, and accident, courts of law cannot and do not afford any redress: in others they do, but not in so complete a manner as a court of equity.

A court of equity also assists the jurisdiction of the courts of law in cases where the courts of law have no like authority. It will remove legal impediments to the fair decision of a question depending at law, as by restraining a party from improperly setting up, at a trial, some title or claim which would prevent the fair decision of the question in dispute; by compelling him to discover, upon his own oath, facts which are material to the right of the other party, but which a court of law cannot compel him to disclose; by perpetuating, that is, by taking in writing and keeping in its custody, the testimony of witnesses, which is in danger of being lost before the matter can be tried; and by providing for the safety of property in dispute pending litigation. It will also counteract and control fraudulent judgments, by restraining the parties from insisting upon them.

The exclusive jurisdiction of a court of equity is chiefly exercised in cases of merely equitable rights, that is, such rights as are not recognised in courts of law. Most cases of trust and confidence fall under this head. This exclusive jurisdiction is exercised in granting injunctions to prevent waste or irreparable injury; to secure a settled right, or to prevent vexatious litigation; in appointing receivers of property which is in danger of being misapplied; in compelling the surrender of securities improperly obtained; in preventing a party from leaving the country in order to avoid a suit; in restraining any undue exercise of a legal right; in enforcing specific performance of contracts; in supplying the defective execution of instruments, and correcting and altering them according to the intention of the parties, when such intention can be satisfactorily proved; and in granting relief in cases where deeds and securities have been lost.

The following short outline of the course of proceeding in a suit of chancery, taken in connection with other articles in this work, such as CHANCELLOR, CHANCERY, DEPOSITION, may probably give somewhat more information on the subject of equity jurisdiction that is found in books not strictly professional.

A suit on the equity side of the courts of chancery is commenced by presenting a written petition to the lord chancellor, containing a statement of the plaintiff's case, and praying for such relief as he may consider himself entitled to receive. This petition is called a Bill, and is in the nature of the Declaration at common law; but if the suit is instituted in behalf of the crown, or a charity, or any of the objects under the peculiar protection of the crown, the petition is in the form of a narrative of the fact by the attorney-general, and is called an Information. There is also a petition termed an Information and Bill, which is, where the attorney-general, at the relation (that is, the information) of a third person (thence called the relator), informs the court of the facts which he thinks are a fit subject of inquiry. The practice in all these proceedings is the same. At the end of the statement in a bill, there is added what is called the interrogating part, which consists of the statements of the bill thrown into the form of distinct questions, and often expressed in terms of great length and particularity. The statements in the bill are not made upon oath. In order to obtain a full and complete discovery from the defendant, both as regards the complaint and the supposed defence, various allegations are made in many cases from mere conjecture. Bills of this nature are called Original Bills, and either may be for discovery and relief, or for discovery merely.

When the bill is placed on the records of the court it is said to be *filed*, and the writ of Subpœna issues, which commands the defendant to appear and answer the allegations of the bill within a certain time.

If, upon the face of the bill, it should appear that the plaintiff is not entitled to the relief prayed for as against the defendant, the defendant may demur, that is, demand the judgment of the court upon the statements made by the plaintiff, whether the suit shall proceed; and if any cause, not apparent upon the bill, should exist why the suit should be either dismissed, delayed, or barred, the defendant may put in a plea, stating such matter, and demanding the judgment of the court as in the case of a demurrer. But if neither of these modes of defence is applicable, and the defendant cannot disclaim all knowledge of the matters contained in the bill, he must answer upon oath the interrogatories in the bill according to the best of his knowledge, remembrance, information, and belief. This mode of defence is styled an Answer.

In the successive stages of a suit, references as to the pleadings, and as to facts, may be made to the masters of the court of chancery: as for instance, if any improper statements be made reflecting upon the character of any party, which are not necessary to the decision of the suit, the pleadings may be referred to the Master for scandal. If the defendant does not answer the bill with sufficient precision, the plaintiff may except to the answer for insufficiency, and this question is decided by the masters in chancery. If the answer is decided to be insufficient, the defendant must answer further.

It frequently happens that during the progress of the suit, from the discovery of new matter, the deaths and marriages of parties, and other causes, the pleadings become defective, and in these cases it is necessary to bring the new matter, or parties becoming interested, before the court. This is done by means of further statements, which refer to the previous proceedings, and are in fact merely a continuation of them, which are called Supplemental Bills, Bills of Revivor, or Bills of Revivor and Supplement, according to the nature of the defect which they are intended to supply. These bills are called Bills not Original.

There is also a third class, called Bills in the Nature of Original Bills, which are occasioned by former bills, such as cross bills, which are filed by the defendant to an original bill against the plaintiff who files such bill, touching some matter in litigation in the original bill, as where a discovery is necessary from the plaintiff in order that the defendant may obtain complete justice. There are also Bills of Review, to examine a decree upon the discovery of new matter, &c., and several others.

Pleas and demurrers are at once argued before *the* court: if allowed, the suit, or so much of it as is covered by the demurrer or plea, is at an end, though the court will generally permit the plaintiff to amend his bill *where it is not* apparent from his own statement that he cannot make any case against the defendant; otherwise the only object attained by the demurrer or plea would be to drive the plaintiff to file a new bill, in which he would omit or amend the objectionable part. But if the demurrer or plea is overruled, the defendant is compelled to answer fully, just as if he *had* not demurred or pleaded. When the answer is filed, the plaintiff, if from the disclosures made he deems it advisable, may amend his bill, that is, may erase such part of his statements as he no *longer* considers necessary, and insert other statements which may appear necessary to sustain his case; and the defendant must answer to this new matter.

In cases where the bill is for discovery only, and in some others, the answer puts an end to the suit; and when the object of the bill is to obtain an injunction, which is granted either upon affidavits before answer or in default of an answer, the suit is also ended, unless the defendant desires to dissolve the injunction. But where a decree is necessary, the cause must come on to be heard either upon evidence taken in writing before the examiners of the court, or commissioners appointed for the purpose; or where the plaintiff considers the disclosures in the answer sufficient, the cause is heard upon bill and answer alone, without further evidence; and this is at the plaintiff's discretion.

The cause is heard in its turn by the master of the rolls or the vice-chancellors, for the lord chancellor rarely hears causes in the first instance. If the nature of the suit admits, a final decree is made; or if any further inquiry be necessary, or any accounts are to be taken, references are made to a master in chancery for those purposes.

The master, being attended by the parties or their agents, makes his report; and the cause again comes on in its turn to be heard upon further directions (as it is called), when the like practice prevails as at the hearing.

This is the form of the simplest suit in equity; but generally suits are of a more complicated character. Many special applications to the court may become necessary at various stages before the cause is ready for hearing; and when reference is made to the master, the inquiries to be prosecuted before him may be entangled in the greatest confusion; and even when he has made his report, either party may except to it, and have his exceptions argued before the court.

Those who wish for a more accurate knowledge of the proceedings in a suit in Chancery, may consult Lord Redesdale's 'Treatise on Pleading;' Beames 'On Pleas;' and the various books on chancery practice.

The English Equity has some resemblance to the Roman Edictal Law, or Jus Prætorium or Honorarium, as it is often called. The English system of equity has arisen out of the imperfections of the common law, which has not been adapted, and perhaps hardly could have been adapted, by the judges of the common law courts to the wants of society. All the higher Roman magistrates (*magistratus majores*) had the Jus Edicendi or authority to promulgate Edicta. By virtue of this power a magistrate made edicta or orders, either temporary and for particular occasions (*edicta repentina*); or upon entering on his office he promulgated rules or orders, which he would observe in the exercise of his office (*edicta perpetua*). Those Edicta which related to the administration of justice had an important effect on the Roman law; and especially the Prætoria Edicta and those of the Curule Ædiles. That branch of law which was founded on the Prætorian Edicta was designated Jus Prætorium or Honorarium, because the prætor held *one of those offices to* which the term *honores* was applied. The Edicta were only in force during the term of office of the magistratus who promulgated them; but his successor adopted many or all of his predecessor's Edicta, and hence arose the expression of 'transferred edicts' (*tralaticia edicta*); and thus in the later republic the Edicta, which had been long established, began to exercise a great influence on the law, and particularly the forms of procedure. About the time of Cicero many distinguished jurists began to write treatises on the Edictum (*libri ad edictum*). Under the emperors new Edicta were rarer, and in the third century of our æra they ceased. Under the reign of Hadrian, a compilation was made by his authority of the edictal rules, by the distinguished jurist Salvius Julianus, which is spoken of under the name of *Edictum perpetuum*. This edictum was arranged under various heads or titles, such as those relating to marriage, tutores, legata (legacies), and so on.

By the term Prætorian Edict the Romans meant the Edicts of the Prætor Urbanus, who was the chief personage employed in the higher administration of justice under the Republic. The Edicta which related to *peregrini* (aliens) were so named after the Prætor Peregrinus; and other edicta were called Censoria, Consularia, Ædilicia, and so on. Sometimes the Honorariæ actiones, those which the prætor by his edict gave, were named in like manner from the prætor who introduced them. Sometimes an edict had its name from the matter to which it referred.

The Jus Prætorium is defined by Papinian ('Dig.' i., tit. i. 7) as the law which the prætors introduced for the purpose of aiding, supplying, or correcting the law (*jus civile*), with a view to the public interest. The edict is called by Marcianus 'the living voice of the *jus civile*,' that is, of the Roman law. ('Dig.' i., tit. i. 8.) The Prætorian

Law, as thus formed, (*jus prætorium*) was a body of law which was distinguished by this name from the Jus Civile, or the strict law. The opposition resembled that of the English terms equity and law. In its complete and large sense, Jus Civile Romanorum, or the law of the Romans, of course comprehended the Jus Prætorium; but in its narrower sense Jus Civile was contrasted, as already explained, with the Jus Prætorium. The Jus Honorarium was in fact the organ by which the Jus Gentium was incorporated in the Roman system; and the Jus Gentium means the general rules of law which all people acknowledge, or would acknowledge, if those rules or principles could be submitted to their judgment.

The origin of the Roman edictal law is plainly to be traced to the imperfections of the old Jus Civile, and to the necessity of gradually modifying law and procedure according to the changing circumstances of the times. It was an easier method of doing this than by direct legislation.

EQUIVALENTS, CHEMICAL. [ATOMIC THEORY.]

EQUU'LEUS (the Little Horse), a constellation of Ptolemæus, surrounded by Pegasus, Vulpecula, Aquila, and Capricornus.

EQUU'LEUS PICTO'RIS (the Painter's Horse, or easel), a constellation of Lacaille, situated close to Canópus, the principal star of Argo.

ERA. [ÆRA.]

ERA'NTHEMUM, a genus of acanthaceous plants with showy purple flowers, some of whose species are occasionally seen in hothouses in this country. *E. pulchellum* and *E. bicolor* are the handsomest species in cultivation, and when well managed are very effective.

ERANTHIS, a small genus cut off from the old Helleborus. *E. hyemalis*, or Winter Aconite, is a pretty plant, which enlivens our gardens with its bright yellow flowers in the early spring. Another species, *E. sibirica*, inhabits Siberia, but has not yet found its way into our gardens.

ERASMUS was born October 28, 1467, at Rotterdam, where there is a bronze statute of him, erected in 1622. He was the illegitimate son of a citizen of Gouda, named Gerrit (Gerard), which, according to a pedantic fashion of the day, he translated doubly into Desiderius Erasmus. During his father's life he was carefully educated; but at the age of fourteen he fell into the hands of dishonest guardians, who wasted his patrimony, and, to conceal their peculations, drove him, very unwillingly, into a monastery. He took the vows at Stein, in 1486. Fortunately his skill in Latin caused him to be employed as private secretary to the bishop of Cambrai, who, in 1496 authorized him to proceed to Paris to continue his studies. At Paris Erasmus barely supported himself by taking pupils, in sickness and poverty. For many years he led a wandering life, relying on the bounty of those patrons who were attracted by his learning and sprightly wit, sometimes in France, sometimes in the Netherlands, sometimes in England, to which he was a frequent visitor. In England he became intimate with More, Colet, dean of St. Paul's, and other learned men, of whom he has spoken in high terms. For several years he applied himself diligently to the study of Greek. He was self-taught, he says; and one of his favourite employments was the translation of short Greek treatises into Latin, which answered the double purpose of improving himself, and furnishing him with a number of books to dedicate to his wealthy friends. Careless however of economy, and not averse to pleasure, Erasmus was continually in want; and in one of his letters (xii. 21) he duns Colet for fifteen angels, promised for the dedication of his treatise 'De Copia Verborum.'

In 1506 Erasmus paid his first visit to Italy, during which he obtained from Pope Julius II. a dispensation from his monastic vows. At Bologna, Venice, and Padua, he improved his knowledge of Greek under the instruction of the best Greek and Italian scholars. He returned to England in 1510, and resided for some time at Cambridge, where he was appointed Lady Margaret Professor (in divinity) and also lectured on Greek; his lodging was in Queen's College, in the grounds of which Erasmus's Walk is still shown. But, in 1514, on an invitation from the archduke, afterwards Charles V., he went to Brabant, with the office of counsellor, and a salary of 200 florins. After this we find him resident sometimes in the Netherlands, sometimes at Basel, where the great work, in which he had been many years engaged, the first edition of the New Testament in Greek, was published in 1516, accompanied by a new Latin translation.

At the dawn of the Reformation, Erasmus, who in his witty writings had exposed many abuses of the Roman Catholic church, especially those connected with the monastic system, was much embarrassed. It is clear that at heart he went a long way with the reformers, but he was of a timid temper, disinclined to sacrifice either life or comfort to his opinions.

He removed to Basel in 1521, where, in 1522, his 'Colloquies' were published. In these Colloquies, which are generally very amusing, Erasmus has made some of his smartest attacks on various superstitions of the Roman Catholic church. In 1529 Erasmus removed to Freiburg, when the reformed party acquired the ascendancy in Basel: for to the last he never threw off an external adherence at least to the ancient faith. But in 1535 he returned to his former place of abode, endeared as it was by the presence of his most valued friends, in hope of renovating his declining health. About this time he received testimonies of high respect from Pope Paul III., who gave him a benefice. He died at Basel, July 12, 1536, leaving an enduring reputation as the first wit of his age, the man of most general learning, and the most active and serviceable instrument in bringing about the revival of sound learning. Nor were his contributions small towards the success of the Reformation; he was an able sapper, though he wanted energy to storm the breach with Luther and his associates.

The Latin style of Erasmus is clear and elegant, like that of one who spoke and wrote Latin as readily as his mother tongue. His Letters comprising those of many learned men to himself, form a most valuable and amusing collection.

There are lives of Erasmus by Knight and by Leclerc. At Basel there is a portrait of Erasmus by Holbein; there is one also in the hall of Queen's College, Cambridge. The last edition of the complete works of Erasmus is that of Leyden, by Leclerc, 1703, 10 vols. fol., often bound in eleven.

ERASTIANISM. [ERASTUS.]

ERASTUS, THOMAS, a physician, and the author of various medical works, but better known for the use made of his name in ecclesiastical discussions. He was born at Baden in Switzerland, on the 7th of September, 1524. He obtained the rudiments of his education in his native place, and studied in the neighbouring city of Basel in 1540. At Basel he seems to have studied divinity, philosophy, and literature. He afterwards went to Bologna, where he studied medicine. After having remained nine years in Italy he went to Germany, and was by the Elector Palatine Frederic III. made professor of physic in the University of Heidelberg. He was appointed physician to the prince, and held rank as councillor of state in the palatinate. He soon afterwards entered into polemical controversy. In 1564 a conference was held in the monastery of Maulbronn on the question of the real presence, or rather on the question whether the reference to the body and blood was not entirely figurative, at which Erastus maintained the view that it is figurative. He soon afterwards became involved in a controversy on excommunication. The remembrance of this controversy was perpetuated by Castelvetro, who had married the widow of Erastus, publishing from his papers the thesis called 'Explicatio Quæstionis gravissimæ de Excommunicatione,' which seems to have been written in 1568, and was published in 1589. The general principle adopted by Erastus is, that ecclesiastical censures and other inflictions are not the proper method of punishing crimes, but that the administration of the penal law, and of the law for compelling performance of civil obligations, should rest with the temporal magistrate. He held that the proper ground on which a person could be prohibited from receiving the ordinances of a church—such as the sacrament or communion of the Lord's Supper—was not vice or immorality, but a difference in theological opinion with the church from which he sought the privilege. The church was to decide who were its members, and thereby entitled to partake in its privileges, but was not entitled to punish offences by withholding these privileges, or by inflicting any other punishments on the ground of moral misconduct.

Few authors so often referred to as Erastus have been so little read; and consequently his doctrines have been misunderstood, or misrepresented, as in the case of the late discussions in the church of Scotland. The original theses are very rare. An English translation was published in 1669, and was re-edited by the Rev. Robert Lee in 1845. Erastus died at Basel on the 31st of December, 1583.

(Ersch und Gruber, *Allgemeine Encyclopädie;* Adamus, *Vitæ Germanorum Medicorum*, 107–109.)

ERATO. [MUSES.]

ERATOSTHENES, a distinguished contemporary of Archimédes, is stated to have been born at Cyréne in the year 276 B.C. He possessed a variety of talents seldom united in the same individual, but not all in the same eminent degree; his mathematical, astronomical, and geographical labours, are those which have rescued his name from oblivion.

Eratosthenes had not only the advantages arising from the instruments and observations of his predecessors, but the great Alexandrian library was intrusted to his superintendence by the third Ptolemæus (Euergetes).

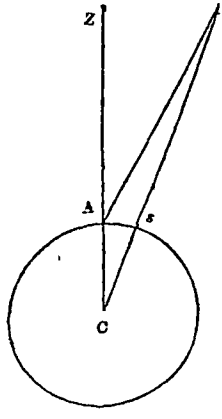
The only work attributed to Eratosthenes which has come down to us entire, is entitled 'Catasterismi,' and is merely a catalogue of the names of forty-four constellations, and the situations in each constellation of the principal stars, of which he enumerates nearly five hundred, but without one reference to astronomical measurement. We find Hipparchus quoted in it, and mention made of the motion of the pole. These circumstances, taken *in conjunction* with the vagueness of the descriptions, render its genuineness extremely doubtful; at all events it is a work of little value. It may be seen in the Oxford edition of Aratus, and was republished by Shaubach, with notes by Heyne (Gött., 1795). A more correct edition of the text was published by F. K. Matthiæ, in his edition of Aratus, Frankfort, 1817, 8vo.

We find him engaged in astronomical researches far more exact and more worthy of his genius. By his observations he determined that the distance between the tropics, that is, twice the obliquity of the ecliptic, was $\frac{1}{83}$ of an entire circumference, or 47° 42′ 39″, which makes the obliquity to be 23° 51′ 19″.5, nearly the same as that supposed by Hipparchus and Ptolemæus. As the means of observation were at that time very imperfect, the instruments divided only to intervals of 10′, and corrections for the greater refraction at the winter solstice, for the diameter of the solar disc, &c., then unknown, we must regard this conclusion as highly creditable to Eratosthenes.

His next achievement was to measure the circumference of the earth. He knew that at Syéne (now Assouan) the sun was vertical at noon in the summer solstice; while at Alexandria, at the same moment, it was below the zenith by the fiftieth part of a circumference: the two places are nearly on the same meridian (error 2°). Neglecting the solar parallax, he concluded that the distance from Alexandria to Syene is the fiftieth part of the circumference of the earth; this distance he estimated at 5000 stadii, which gives 250,000 stadia for the circumference: the diagram in the next page will explain the principle of this admeasurement.

C the centre of the earth, A Alexandria, S Syene, S the sun $\angle$ ZAS the $\frac{1}{50}$ of four right angles, $\angle$ ASC the sun's parallax, which is very small: $\therefore \angle$ ACS is very nearly $=$ ZAS; therefore distance AS $=\frac{1}{50}$ of circumference of earth.

Thus Eratosthenes has the merit of pointing out a method for finding the circumference of the



earth. But his data were not sufficiently exact, nor had he the means of measuring the distance As with sufficient precision.

Eratosthenes has been called a poet, and Scaliger, in his commentary on Manilius, gives some fragments of a poem attributed to him, entitled 'Hermes,' or 'de Zonis,' one of which is a description of the terrestrial zones: it is not improbable that these are authentic.

That Eratosthenes was an excellent geometer we cannot doubt, from his still extant solution of the problem of two mean proportionals, preserved by Theon. There is a lost treatise quoted by Pappus, 'De Locis ad Medietates,' on which Montucla has offered some conjectures, 'Histoire des Math.,' ann. vii. p. 280.

Eratosthenes appears to have been one of the first who attempted to form a system of geography. His work on this subject, entitled 'Geographica' (Γεωγραφικά), was divided into three books. The first book contained a history of geography, a critical notice of the authorities used by him, and the elements of physical geography. The second book treated of mathematical geography, and contained the method above explained, by which he determined the earth's circumference. The third book contained the political or historical geography, arranged according to the three great divisions of the known globe, Europe, Asia, and Libya. The whole work was accompanied with a map of the known world. The geography of Eratosthenes is lost; the fragments which remain have been chiefly preserved by Strabo, who was doubtless much indebted to him.

Eratosthenes also busied himself with chronology. The reader will find some remarks on his Greek chronology in Clinton's 'Fasti Hellenici;' and on his list of Theban kings, by R. Rask, in his little work on the ancient Egyptian chronology, German translation, Altona, 1830.

The properties of numbers attracted the attention of philosophers from the earliest period, and Eratosthenes also distinguished himself in this branch by a work which he denominated Κόσκινον, *Cribrum*, or *Sieve*, the object of which is to separate prime from composite numbers.

Eratosthenes arrived at the age of eighty years, and ultimately becoming weary of life, died by voluntary starvation. (Suidas, 'Eratosthenes.') Montucla, with his usual naïveté, says it would have been more philosophical to await death 'de pied ferme.'

ERBIUM, a metal discovered by Mosander associated with yttria. Its properties are little known. Some of them are as follows:—Its oxide becomes of a dark orange colour when heated in contact with the air, which colour it loses with a little weight when heated in hydrogen gas. It is to the presence of this oxide that yttria owes its yellow colour, when prepared as hitherto directed. The sulphate and nitrate of erbium are free from colour. It does not appear to have been reduced to the metallic state.

ERCE. [ARIE'GE.]

ERCILLA Y ZUÑIGA, ALONSO, was born at Madrid in 1533. While very young he was appointed one of the pages of the prince of Asturias, afterwards Philip II., whom, at the age of fourteen, he accompanied through Italy, Germany, and the Netherlands. On the occasion of Philip's marriage with queen Mary in 1554, Ercilla came to England. While in London he heard of a revolt of the Araucanians (Araucanos) against the Spaniards in Chile, and his military ardour being excited by the news, he volunteered to go to America. It was amidst the toils and dangers of a campaign against barbarians, with nothing to write on but small scraps of waste paper, and often only leather, that Ercilla wrote the first part of his 'Araucana,' so named from the war and country of Arauca, or of the *Auca* people. After numerous escapes from the dangers of the war, and much impaired in health, although only in his twenty-ninth year, the poet-soldier returned to Spain, but only to experience neglect. Ercilla afterwards wandered over Europe, and was at one time gentleman of the bed-chamber to the emperor Rudolph, but at length settled at Madrid, where he lingered in retirement and penury, writing poetry till his death, the time of which is not ascertained, though it is known that he was alive in 1596. It is only the 'Araucana' which has recommended Ercilla to posterity. He published the first part alone; then the first and second parts together in 1577; and the whole three parts in 1590, many editions of which have appeared successively in different places. Voltaire, who, by his 'Essai sur la Poésie Epique,' has made the 'Araucana' more generally known, had not however read the whole, as is evident from the mistakes he has made, and the 'Biographie Universelle' has fallen into similar errors.

Nothing however short of a sketch of the 'Araucana,' could give a just idea of its plan and execution; but we may safely assert that Ercilla succeeded in infusing an Homeric spirit into his long narration, which, independently of its other merits, is a real historical record.

ERECTHEIUM, a beautiful Ionic temple dedicated to Erechtheus, built near the western brow

of the Acropolis at Athens, and at the time when Stuart visited the place forming part of the modern fortress of the Acropolis. Connected with this building, and placed on one side of it at the end of the cella, is a tetrastyle pseudo-dipteral Ionic portico, in the same style as the portico of the Erectheium, forming a small temple which was dedicated to Minerva Pólias; and on the opposite side is a small roofed building supported by crayátides placed on an elevated basement, forming another small temple dedicated to Pandrosos, and called the Pandrosium. The back wall of the cella of the temple of Erectheus is decorated with four semi-columns in antis engaged in the wall, and of the same order as the portico, which is hexastyle, and raised on three steps, forming a basement which runs round the entire building with its adjuncts. In the side portico, called Minerva Pólias, which was most probably constructed after the Erectheium, there was no opportunity of producing a depth of shadow by the deep recess of an open próthyrum, and the architect accordingly appears to have adopted the pseudo-dipteral portico to produce a somewhat similar effect, as well as to gain a covered space for those who officiated. It would appear from the regularity of the plan of the Temple of Erectheus, that it was constructed before the other buildings, and was of that regular parallelopipedal figure most commonly employed in such edifices; and that at a later period the Pandrosium was constructed, with the portico on the opposite side forming the entrance or vestibule to the cella of the temple, which was formed from a part of the cella of the Temple of Erectheus, cut off from the end of that cella, which was either at that time or previously lighted with windows.

H. W. Inwood, the architect, has imitated the Erectheium and Pandrosium in the external design of part of the new St. Pancras Church, London.

EREMECAUSIS is the act of gradual combination of the combustible elements of a body with the oxygen of the air. This process is constantly going on in combustible bodies exposed to the atmosphere, and one of the first changes which take place during the decomposition of animal and vegetable substances, is the union of one or more of their elements with oxygen. The changes in colour, consistence, and other properties which vegetable juices, saw-dust, leaves of trees, blood, &c., undergo when exposed to the atmosphere, are owing to the same cause. Eremecausis differs from fermentation and putrefaction in the fact that it cannot take place without the access of atmospheric air, through which means the oxygen is supplied to the decaying body. Eremecausis must precede any decomposition of an organized substance; and it is by virtue of this law that animal food may be kept from putrefaction by being heated to the temperature of boiling water, and then secured in air-tight vessels. Food thus prepared has been kept for fifteen years, and when the vessels were opened in which it was contained, it has been found as fresh as when first secured. (Liebig, *Chemistry of Agriculture;* Turner, *Elements of Chemistry*, 7th edition.)

ERETRIA. [EUBŒA.]

EREWASH. [DERBYSHIRE.]

ERFURT, a government of Prussian Saxony, is bounded N. by Hanover and Brunswick, E. by Merseburg and Saxe Weimar, S. by Saxe-Coburg-Gotha, Saxe-Meiningen, and Saxe-Weimar, and W. by Hesse. Its length from N.W. to S.E. is 60 miles; its breadth varies from 8 to 38 miles. Its area is 1272 square miles, and its population in 1843 amounted to 335,543, rather more than one-third of whom are Roman Catholics, and the remainder Evangelical Protestants. The soil of this province is favourable for the cultivation of grain, and rather more than one half of its surface is arable land. About one-fifth of it is appropriated to meadows or pastures, and rather more than one-fourth is occupied by woods and forests. The principal rivers are the Erlau, the Saale, and the Wipper. The chief products are grain, flax, tobacco, hops, oil, and salt. Great numbers of horses, horned cattle, sheep, goats, and swine are reared. In the circles of Weissensee and Schleusingen there are mines of iron, lead, and copper. Marble and gypsum, as well as sulphur, are also among its mineral productions. Erfurt is likewise distinguished for its manufactures of iron and steelware, tin plates, seed oil, woollen yarns, cloths, flannels, and carpets, linens, silks, cottons, stockings, paper, porcelain, glass, brandy, wooden clocks, &c.

The government is divided into 9 circles named from the principal town in each. The most important of these towns are, ERFURT: *Langensalza*, a walled town, which stands on the Salza, a feeder of the Unstrut, 16 miles N.W. from Erfurt, and has 7000 inhabitants, who manufacture silks, woollens, calicoes, and gunpowder: *Mühlhausen*, an ancient walled town, about 30 miles N.W. from Erfurt, pleasantly situated on the Unstrut, which has 5 churches, a gymnasium, and 12,000 inhabitants, who manufacture woollen cloth, calicoes, beer, tobacco, spirits, leather, oil, glue, starch, &c.; it has also several dyeing and fulling mills: *Nordhausen*, an old fashioned place girt with walls and towers, and entered by 7 gates, which stands at the southern extremity of the Hartz mountains in a very fertile country, and has 11,000 inhabitants; it has very large distilleries, 7 churches, a gymnasium, and manufactures woollen cloths, flannels, chemical products, rape-oil, and leather; great numbers of oxen and swine are fattened on grains and pressed rapeseed; a very fertile tract called Goldne Aue (golden vale), watered by the Helme, commences near this town: *and Suhl*, a thriving manufacturing town, which stands on the Lanter, at the foot of the Domberg, and has 7,500 inhabitants, who manufacture large quantities of ticking and dimity, and fire-arms, swords, bayonets, ramrods, surgical instruments, &c.; the iron and steel (7000 cwts.) for these last are furnished by 9 forges in the neighbourhood. Suhl stands in a district of the Thüringerwald, entirely separated from the rest of the Prussian territory.

(Müller's *Handbuch;* Murray's *Handbook for N. Germany.*)

ERFURT, the capital of the government of Erfurt, is situated on the Gera, a tributary of the

Unstrut, in a richly cultivated plain, in 50° 58′ N. lat., 11° 3′ E. long., 14 miles by railway W. from Weimar, and has 25,000 inhabitants. It was formerly the capital of Thuringia, and is a fortress of the second order, possessing two citadels, one, the Petersburg, within the walls, and the other, Cyriaxburg, on Mount Cyriax, outside of the town. Erfurt has six gates, five public squares, one of which, the market-square, is ornamented with an obelisk of stone fifty feet high, erected in 1802, to Charles, elector of Mainz, several broad and well-built streets, 11 Roman Catholic churches, and 8 Protestant. The cathedral church of St. Mary is a fine gothic structure; in this church there is a bell called the Maria Clara Susanna, cast in 1492, which weighs 13 tons and upwards. The cell of the former Augustine monastery, in which Luther resided from 1501 to 1508, is still shown; it contains several memorials of him. The monastery is now used as an orphan house. Of the numerous religious houses which Erfurt formerly possessed the Ursuline convent alone remains, and has a female school attached to it, which is superintended by the nuns. Among the scholastic institutions in the town are—a high school, a gymnasium, a deaf and dumb school, schools of surgery, design, and architecture. Among other institutions there are—a botanical garden; a library of about 50,000 volumes, formerly belonging to the university, which was suppressed in 1816; an ophthalmic hospital; and a general hospital. Erfurt is the seat of provincial administration and of the provincial tribunals. It has considerable manufactures of cottons and woollens, besides less extensive ones of linens, ribbons, leather, soap, earthenware, meal, seed-oil, stockings, gloves, tobacco, &c., and it carries on a brisk trade in fruits, seeds, grocery and drugs, grain, &c.

ERGOT, a name bestowed upon a peculiar state of the seed of several cereal grains, but most frequently of the rye, which resembles a spur, or horn; hence, likewise, termed *Secale cornutum*, or Spurred Rye. The spur is of variable length, from a few lines to two inches, and is from two to four lines in thickness; when large, only a few grains in each ear are affected; when small, in general all of them are diseased. In colour the exterior or husk is of a bluish-black or violet hue, with two or three streaks of dotted gray; the interior is of a dull whitish or gray tint. It is specifically lighter than water, which affords a criterion for distinguishing sound from tainted grain. When fresh it is tough and flexible, but brittle and easily pulverized when dry. The powder is apt to attract moisture, which impairs its properties; and time destroys them.

Spurred rye occurs more frequently in some countries and districts than in others, and more abundantly in some seasons than in others. Rye raised in poor soil, and in a humid close air, such as that of the district of Sologne in France, is most liable to be infected; but, according to the experiments of Willdenow, it may be brought on at any time, by sowing the rye in a rich damp soil, and watering the plants freely in warm weather. A very rainy season, such as was that of 1816, is apt to produce it.

Bread prepared from grain which has a large admixture of the spur, occasions very distressing and often fatal effects, which are shown more or less rapidly according to the quantity present in the food, and the circumstances in which those who use it are placed. The symptoms which result from spurred grain, when used for a considerable time, are of two distinct kinds, one of a nervous nature characterized by violent spasmodic convulsions, the other a disordered state of the constitution, which terminates in the peculiar disease called *gangræna usillaginea*, or dry gangrene. In the case of parturient females, when given at a certain stage of the labour, it is admitted by most practitioners and writers to produce specific effects, and to expedite the labour in a very marked manner. It is by some persons alleged to produce hurtful effects upon the child; but such consequences probably occur only when it has been used at an improper stage of the labour; or when it ought not to have been employed under any circumstances.

Ergot is produced by a fungus belonging to the Gymnomycetous division, and constituting one of two species of *Spermoëdia*, according to Fries. He calls it *S. clavus*, and separates it from the genus *Sclerotium*, to which it had previously been referred, on account of its growing in the inside of other plants, and having no proper fructification. According to Quekett, the plant which produces this disease is peculiar, and he calls it *Ergotælia abortans*.

ERI'CA, one of the most extensive and beautiful genera known in the vegetable kingdom, belonging to the natural order *Ericaceæ*.

The genus includes a great variety of species which possess much diversity of colour and beauty in their flowers. Lovely as even our wild moorland heaths are, they rank among the lowest in point of beauty in this extraordinary genus, in which all the hues of red, pink, and purple, vie with each other in the most brilliant manner, assuming every tint but blue, and fading into the purest and most transparent white. The forms and sizes of the corolla are as varied as the colours, and are so exquisitely beautiful and delicate as to render description useless. The best arrangement in any work published in this country of these beautiful plants is to be found in the second edition of the 'Hortus Kewensis.' An enumeration with brief characters of 294 species, illustrated with a considerable number of good wood-cuts, is published in Loudon's 'Encyclopædia of Plants.'

The genus is confined to the old world. A few species occur in the north of Europe, and others in the countries bordering on the Mediterranean. In Great Britain heather covers large tracts of waste land, and is used to thatch houses, to make brooms, and even beds in the northern parts of the island. There is a double variety of this species which is extremely beautiful. All our *British* heaths are improved by cultivation, and are general favourites where the climate and soil are suited to them. They will not however thrive in hot dry places and in any common soil, but require sandy peat earth, and a situation where they are moderately shaded from the sun. *Erica carnea*, one of the few plants whose flowers bid defiance to the rigour

of winter, and appear as the earliest harbingers of spring, is found wild in Germany and generally on the mountains of middle Europe. *E. australis, arborea, Mediterranea*, and *codonodes*, adorn the rocks of the south of Europe.

But it is at the Cape of Good Hope that the principal part of the species is found; indeed the whole of those which are cultivated in greenhouses. In their native country they are by no means so handsome as when cultivated, but form scraggy shrubby bushes, with little beauty.

On account of the great beauty of Cape heaths, and the property which so few plants possess in common with them of producing their blossoms the whole year round, they have become universal favourites with all those who have a greenhouse at command. But an impression that there is great difficulty in cultivating them, and in fact the want of success that often attends their management, has deterred so many from attempting to grow them, and thus has robbed our gardens to such a degree of their very greatest exotic ornament, that we shall take this opportunity of stating at some length what precautions are really requisite in cultivating heaths, and of pointing out to what causes failure is generally to be attributed.

If new varieties are wanted, the only way is to raise them from seed, but when this is not the object, by far the best method of propagating is from cuttings. Much of the success which attends the striking of cuttings depends upon the state they are in when taken from the plant; if they are too young, they are liable to damp off, and on the other hand, if they are too old, they do not emit roots freely; therefore the best is a middle course, which is not liable to either of these objections.

The leaves of the cutting must be stript off to about one-half of its length, and its end cut with a sharp knife: in this state it is fit for the cutting-pot. In preparing the pot, it is necessary to be particular about the draining, and for that purpose it should be filled to within about two inches of its top with broken pots, rough ashes, or something of this description; the remainder must be filled with sand, which should be procured as free from ferruginous matter as possible. Between the sand and draining, it is a good plan to have a thin layer of decayed turf or rough peat soil, otherwise the water will carry down the particles of sand, and render the drainage of little or no use.

Some cultivators press the sand very hard, water it well, and then put in the cutting; others do not press it at all, nor give it any water until the cuttings are introduced; the last method is perhaps the best, at least the intended effect is best produced by it; for while the water which is given afterwards, in the former case renders the cuttings more loose, in the latter they always become more firm; and it will be found that those which have not been pressed at all, in a few days will be more firmly fixed than those which have been treated in a different manner.

Bell-glasses are frequently put over heath cuttings, but these are in most cases unnecessary, unless where the cuttings are exposed to a current of air, and where evaporation goes on rapidly. If bell-glasses are used at all, it is of the greatest importance to look over and wipe them occasionally otherwise the moisture which is deposited upon the glass will prove very injurious to the young cuttings.

Heaths may be propagated at any season of the year when the young wood can be obtained in a firm but not hardened state, but the spring is the best time for performing this operation, because the young plants get rooted before the commencement of the dull and damp winter season, in which heaths are apt to suffer if injudiciously treated. If it is winter when the cuttings are put in, they will require a little artificial heat, and may be placed in a stove; but if in the end of spring or summer, when the weather is warm, a cool greenhouse or frame is quite sufficient to ensure their growth.

After the cuttings are sufficiently well rooted, which is easily known by their beginning to grow freely, they must then be potted off, in pots of the smallest size, and regularly shifted into larger as they require it.

With regard to the soil in which it is most advisable to grow them, as very different statements are to be found in books, we quote Mr. M'Nab's words. 'The soil,' he says, 'for the first potting should be one half peat and one half sand, always taking care to drain the pots well with small pieces of broken pots or cinders. The soil for the second potting should be about two-thirds peat and one-third sand, and in all the after-pottings the soil should be the same as hereafter is recommended.'

Cape heaths thrive best in a black peat soil, taken from a dry heath or common which is never overflowed with water. In general it should not be taken off more than five or six inches deep.

Mr. M'Nab, in shifting his heaths, has always at hand some fragments of soft freestone, which he introduces amongst the soil around the ball of the plant; the size of these stones is regulated by the width of the pots or tubs into which they are put, and are found to secure an excellent drainage.

The same successful cultivator recommends the plants to be raised a little higher in the pot at each shifting than they were before; and after several shiftings the old ball around the stem will be raised two or three inches above the level of the edge of the pot or tub; always taking care, however, to leave sufficient room to hold enough of water between the base of the cone of earth and the rim of the pot.

This is an excellent plan, and one which cannot be too highly recommended, for there is scarcely a chance of the plant suffering from too much water being given it, even in winter; and if by chance it should receive too much, it can only be round the sides of the pot or tub, and at the extremity of the roots, whence it is carried off by the quantity of draining below. Moreover, and this is a most essential point, the water percolating through the earth next the sides of the pot ensures the tips of the roots being always kept damp and cool, a precaution absolutely indispensable to preserving heaths alive. It will generally be found that the sudden death so common among these plants is owing to the sides of the pot having be-

come accidentally dried and heated. On this account a low pit, in which the pots can be so arranged that their sides are always in the shade, will be found a convenient place to grow them in during summer.

By treating Cape heaths in this way, they may be brought to a state of perfection quite unknown in their native country. From a list of some of the larger specimens grown in the Royal Botanic Garden, Edinburgh, it appears that they have attained the height of six, seven, and eight feet.

The degree of cold which these plants will bear without injury is much greater than is generally imagined; at the same time experience shows that some are far more hardy than others.

Those who have not the convenience of a greenhouse or heath-house to grow Cape heaths in, may nevertheless form beautiful clumps in their flower gardens by a judicious selection of hardy sorts, and by attending to the principles which have been laid down, namely draining the ground, removing the soil where it is not suitable for their growth, and filling the space with a mixture of peat soil and sand, and at the same time introducing a quantity of freestone to equalize the moisture of the soil.

ERICACEÆ, a natural order of exogens, which derives its name from the extensive genus *Erica*. This extremely beautiful order of plants is likewise a poisonous order.

It is unknown in very hot countries except at considerable elevations; it appears generally to love exposed situations, and, with the exception of *Erica* itself, to follow mountain chains, as it advances from the cool plains of the temperate zone to equinoctial regions.

ERICHTHUS, Latreille's name for a genus of deep-sea crustaceans, and placed by M. Milne Edwards between the genera *Squillerichthus* and *Alima*. The last-named author makes the tribe Erichthians (*Erichthiens*) belong to the family of Unicuirassiated Stomapods (*Stomapodes Unicuirassés*), the general characters of the tribe being an undivided carapace and a styliform rostrum; no moveable rostral plate; and branchiæ, in general rudimentary.

The tribe, according to M. Milne Edwards, is composed of a certain number of small crustaceans approximating to the *Squillæ*, but which have in general only rudimentary branchiæ, and are often completely deprived of them. They are easily distinguished by their carapace, which is large, lamellar, generally transparent, without longitudinal furrows or distinct lobes, and always armed with a styliform rostrum, which advances above the ophthalmic and antennular rings. These two first rings of the head are less distinct than they are in *Squilla*, but have very nearly the same conformation, and move upon the succeeding cephalic segment. The internal antennæ are inserted below and behind the ocular peduncles; they are rather distant from each other, and their slender and cylindrical peduncles are composed of three joints, and carry at their extremity three multiarticulate filaments. The external antennæ are inserted at some distance behind the preceding, and are directed outwards; their peduncle is large, and formed of two joints, of which the first gives origin, by the anterior border of its extremity, to a slender and short stem (tige), composed of two peduncular joints and a multiarticulate filament, the second carrying at its extremity a large oval-shaped blade or lamina with ciliated edges. The epistome is not projecting and swollen as in *Squilla*, and the mouth resembles a pear-shaped tubercle, situated near the middle or towards the posterior third of the lower surface of the carapace. The upper lip has the form of a triangle, with a rounded base which is directed backwards. The mandibles are vertical, swollen at their base, and armed with two branches with dentilated borders, the upper of which raises itself into the interior of the pharynx; their palpiform stem (tige) is either rudimentary or null. The lower lip is large and composed of two swollen lobes. The jaws are small and of the same conformation as those of *Squilla*, excepting that those of the second pair are narrower. The members which represent the anterior jaw-feet, the prehensile feet (pattes ravisseuses), the three pairs of subcheliform feet applied against the mouth, and the three pairs of natatory feet, which terminate the series of thoracic members, are formed and disposed in the same manner as they are in *Squilla*. It is only to be remarked that often the three pairs of subcheliform feet are less approximated to the mouth than they are in the *Squillæ*, and that those of the last three pairs are sometimes rudimentary. The carapace is prolonged more or less far beyond the last rings of the thorax, or even beyond the first segments of the abdomen, but without adhering thereto. The abdomen is elongated; its last segment is very large, and entirely covers the appendages of the preceding ring, which are short, but formed like those of the *Squillæ*. Finally, the false feet suspended from the five first rings of the abdomen are more slender and more elongated than in the other division of the family, and, as has already been noticed, present in general only the vestiges of branchiæ.

Geographical Distribution.—The Erichthians have as yet occurred hardly anywhere else than in the ocean (haute mer), and have hitherto been found only in tropical regions.

The *Erichthians* are resolvable into the following genera:—

1, *Squillerichthus.*—Locality, Asiatic Seas. Example, *S. typus.*

2. *Erichthus.*—*α. Species whose rostrum is very long.* Example, *Erichthus vitreus* (*Smerdis vulgaris*, Leach). Locality, the South Atlantic Ocean. *β. Species whose rostrum is of moderate length.* Example, *Erichthus armatus* (*Smerdis armata*, Leach). Locality, coasts of Africa. *γ. Species having the rostrum extremely short.* Example, *Erichthus Duvaucelli.* Locality, Gulf of Bengal.

3. *Alima.*—*α. Species which have the hand by the prehensile feet unarmed with spines.* Example, *Alima hyalina* (Leach). Locality, Cape Verd. *β. Species which have the hand armed with spines on the prehensile border.* Example, *Alima laticauda.* Locality, New Guinea (Quoy and Gaimard).

ERIDANUS. [Po.]

ERI'DANUS (the river Eridanus), a constellation first mentioned by Aratus, who calls it Eridanus. Hyginus states it to have been named from the Nile, and assigns a reason; but the scholiast on Aratus states this to have been peculiar to the Egyptians. In the heavens it is a winding stream, not very well marked by stars, extending from a bright star (α) of the first magnitude, called Achernes, and situated near the southern part of Phœnix, past the feet of Cetus, and ending at the star Rigel in Orion.

ERIE, LAKE. [Canada.]

ERI'GENA, JOANNES SCOTUS, a native of Ireland, from whence his appellation of Erigena is derived, that of Scotus being synonymous with it, as the Irish were still called in foreign countries Scots in those times, flourished about the middle of the ninth century. He resided chiefly in France, at the court of Charles the Bald. His writings on theological matters were considered as heterodox, and his treatise on the eucharist was condemned to be burnt by the council of Rome A.D. 1059. In his work 'Dialogus de Divisione Naturæ' he displays a wonderful information for the times he lived in, and an intimate acquaintance with the Greek language. He gives large extracts from the Greek fathers, and also quotes Aristotle, Plato, Cicero, Pliny, and other ancient writers, and he gives the opinions of Pythagoras and Eratosthenes on some astronomical topics. Turner, in his history of the Anglo-Saxons, has given an account of this singular work of this writer. Erigena is supposed to have died in France about the year 875. He must not be confounded with Joannes Duns Scotus. [Duns Scotus.]

ERIGERON, a genus of plants belonging to the natural order *Compositæ*, the sub-order *Corymbiferæ*. *E. Philadelphicum* is a native of North America, and is used as a medicine in the United States. It possesses stimulant properties, and is given as an emmenagogue; it also acts on the kidneys, and is considered a valuable diuretic. It has a powerful fœtid smell. *E. acris* contains about 5 per cent. of potassa, and it is sometimes burned for procuring the alkali. It has a strong scent, and like many other species of the family is said to keep away fleas. With species of Conyza and Pulicaria, it has the name of Flea-Bane. It is a native of Europe, and is a common plant in Great Britain. *E. Canadensis* and *E. alpinus* are also found in England and Scotland: the first is a rare plant, and is found on waste ground; the second is a native of the Highland mountains. The species are numerous, and some of them are ornamental plants.

ERINACEUS. [Hedgehog.]

ERINITE (*A seniate of Copper*) occurs in concentric and mammillated layers. Colour brilliant emerald green inclining to grass green. Hardness 4.5 to 5.0. Slightly translucent. Specific gravity 4.0 to 4.1. Found near Limerick. Arsenic acid, 33.78; oxide of copper, 59.44; alumina, 1.77; water, 5.01.

ERINNA, a poetess and the friend of Sappho, flourished about the year 595 B.C. She was born in Lesbos, or in Rhodes, or in Teos, or in Telos, a little island near Cnidos. She was a poetess, and wrote a poem called 'The Distaff,' in the Æolic and Doric dialect: it consisted of 300 hexameter lines. She was the friend of Sappho, and died unmarried at the age of nineteen. Another poetess of this name is mentioned by Eusebius under the year 354 B.C.

ERIOCAULO'NEÆ, a group of endogenous plants subordinate to *Restiaceæ*, for the most part inhabiting swampy or marshy places, or the bottom of lakes, and having the flowers collected in dense heads. The flowers are always very small, and difficult to examine on account of the thinness and delicacy of their texture. *Eriocaulon* itself is the principal genus, consisting of about one hundred and twenty known species, ninety-four or ninety-five of which are met with in the equinoctial parts of America, and one solitary instance, *E. septangulare*, in the Isle of Skye. Mr. Bongard, who has written a monograph of the South American species, states, that in that part of the world, although they prefer marshy and inundated places, yet some are found upon damp sand, others among grass, and some in dry and stony places: they are also frequently met with in alpine situations, some as high as 5590 feet above the sea on the summit of Mount Itambé.

ERIODENDRON. [Wool-Tree.]

ERIO'PHORUM, the systematic name of the sedge-like plant which is called in this country Wild Cotton, or Cotton-Grass, in consequence of the long cottony tufts which wave upon its stalks in marshy and sedgy heaths and wastes in all parts of this country.

ERI'PHIA, Latreille's name for a genus of Brachyurous or short-tailed Crustaceans.

Carapace less wide and more quadrilateral than in the other Cancerians; length, two-thirds more than the breadth; the fronto-orbital border occupies more than one-half, and sometimes more than three-fourths of its breadth; and the latero anterior borders, directed nearly right backwards, only describe a slight curvature, and prolong themselves but little. Orbits, as in the genus *Ruppellia*; but the space which separates their edges from the basilary joint of the external antennæ is very considerable; this joint is but little developed, and does not occupy a fourth of the space comprised between the antennary fossette and the internal canthus of the eyes; on the contrary, the moveable stem of the external antennæ is much more developed than in the *Ruppelliæ*, and is inserted at a small distance from the antennary fossette. For the rest not differing from the other Cancerians.

Milne Edwards divides the *Eriphiæ* into the following genera:—

1. Species having the hands tuberculous.—α. *Front armed with spines.* Example, *Eriphia spinifrons.* Locality, all seas. β. *Front devoid of spines.* Example, *Eriphia gonagra.* Locality, coasts of South America.

2. Species having the hands not tuberculous.—Example, *Eriphia lævimana.* Locality, Isle of France.

ERIVAN, a town in the Russian government

of Georgia, situated about 40° N. lat., 44° 30′ E. long., has about 14,000 inhabitants. It is situated on the Zanga, or Zengin, which flows from the lake of Erivan, and falls into the river Aras. The river is crossed at the town by a handsome stone bridge of several arches. The town is built partly on a hill and strongly fortified. The celebrated Armenian Convent of Etschmiadzin, the residence of the Armenian patriarch, called Cathólicos, and the great centre of Armenian literature, stands about three hours W. from Erivan. The library of this convent is rich in Armenian manuscripts, some of which are said to be of considerable historical value. The base of Mount Ararat is only about six or eight miles from the town. (Ouseley's *Travels;* Ker Porter's *Travels;* Brosset, *Catalogue de la Bibliothèque d'Etschmiadzin,* Petersburg, 1840.)

ERLANGEN. [REZAT.]

ERLANITE occurs massive and amorphous. Structure granular, compact. Colour light greenish gray. Hardness 6.25 to 7.0. Opaque. Specific gravity 3.0 to 3.1. Found near Erla in the Saxon Erzgebirge, forming a bed of 100 fathoms in thickness. Silica, 53.16; alumina, 14.03; lime, 14.39; magnesia, 5.2; soda, 2.61; oxide of iron, 7.14; oxide of manganese, 0.64; water, 0.60.

ERLAU (*Eger*), a town in the Hungarian circle of Hither Theiss, is situated in a beautiful valley in the midst of richly cultivated lands, in 47° 53′ N. lat., 20° 23′ E. long., and has about 18,000 inhabitants. The Erlaubach divides it into two parts, which are surrounded by fortifications about seven miles in circuit, and entered by 6 gates. The town is the seat of an archbishop. It contains four Roman Catholic churches, two monasteries, a Greek and a Protestant church. The houses in the town are large, and built in a neat style. The chief buildings are—the lyceum, in connection with which there is an observatory, a handsome chapel, and a very spacious examination-hall and library, the cathedral church, the church of the Minorites, and the archbishop's palace. The lyceum was formerly a university; it is conducted by 16 professors and attended by a great number of students. The town is important for its baths and its trade in red wines, the produce of the vineyards in the vicinity. The manufactures consist of linens, woollens, hats, &c.

ERMINE. [WEASELS.]

ERNE, LOUGH. [FERMANAGH.]

ERNE'E. [MAYENNE.]

ERNESTI, JOHN AUGUSTUS, was born at Tennstadt, in the Thüringer Wald, on the 4th August, 1707. He was educated at Wittenberg and Leipzig, and became conrector of the school of St. Thomas, in the latter city, in the year 1731. He succeeded J. M. Gessner as rector in 1734. In 1742 the university of Leipzig appointed him professor extraordinary of ancient literature. He was made professor of eloquence in 1756, and professor of theology in 1758: he held the two last named professorships together till 1770, when he gave up the former to his nephew, Augustus William. He died on the 11th September, 1781. Ernesti was a man of considerable abilities, well acquainted with the classical writers, and no mean proficient in theological learning. His Latin style is correct and elegant. The work for which he is best known in his edition of Cicero. His editions of Greek writers are less valuable. His 'Clavis Ciceroniana,' or Index of words and subjects to Cicero's works, is still in general use: Ernesti's editions of Polybius, Tacitus, and Suetonius, have been superseded by those of Schweighäuser, Bekker, and F. A. Wolf.

ERNESTI, AUGUSTUS WILLIAM, nephew of John Augustus preceding, was born at Frohndorf, near Tennstadt, the 26th November, 1733. He was a pupil of his uncle at Leipzig, was made professor of philosophy there in 1765, and succeeded, on his uncle's resignation, to the professorship of eloquence in 1770. He died on the 29th July, 1801. His best known work is an edition of Livy, with a very copious glossary, which was reprinted twice in his lifetime.

ERNESTI, JOHN CHRISTIAN THEOPHILUS, also a nephew of John Augustus, was born at Arnstadt, in the Thüringer Wald, in 1756. He was professor of philosophy in the university of Leipzig from 1782 to 1801, when he succeeded his cousin, Augustus William, as professor of eloquence. He died on the 5th June in the following year. He published editions of Silius Italicus and Æsop; and was the author of some other works.

ERO'DIUM, a genus of plants belonging to the natural order *Geraniaceæ*. The species of this genus, like those of Geranium and Pelargonium, are numerous, upwards of fifty having been described. *E. cicutarium,* Hemlock-leaved Heron's Bill, is a native throughout the whole of Europe, and is found in the north of Africa. It is abundant on sandy soils and waste ground in Great Britain. There are several well-marked varieties, some of which may be really species, as the *E. c. pimpinellæfolium. E. moschatum,* Musky Heron's Bill, is a larger plant than the preceding, and emits, when handled, a strong musky odour. This plant is very generally diffused, and has been found all over Europe, at the Cape of Good Hope, and in Peru. *E. maritimum,* Marine Heron's Bill, is a rare plant, but a native of Great Britain, in sandy and gravelly places near the sea. Most of the remaining species are natives of Europe; some are found in the north of Africa, two or three in Asia, and the same number in America; but the mass of them are truly European.

ERPE'NIUS, or *Thomas van Erpen,* was born at Gorcum, on the 7th of September, 1584. He was educated at Leyden, where he studied theology and oriental literature. In 1613 he was appointed professor of Oriental languages in the university of Leyden, an office to which was added subsequently that of Arabic interpreter to the government of the Netherlands. He died Nov. 13, 1624. The work which has contributed most to give celebrity to Erpenius is his Arabic Grammar, or 'Grammatica Arabica, quinque libris methodice explicata,' published at Leyden in 1613, 4to. It has often been re-edited with additions and alterations, and has been the foundation of nearly every subsequent Arabic grammar printed in Europe down to that of Silvestre de Sacy.

Erpenius did a great deal towards promoting the study of Oriental literature.

ERPETOLOGY, or HERPETOLOGY. [REPTILES.]

E'RPETON (properly *Herpeton*), Lacépède's name for a genus of non-venomous serpents, placed by Cuvier next *Eryx*. This genus is characterized by the presence of two soft prominences covered with scales placed on the muzzle. The head is protected above by large plates; the abdominal plates are not large, and those beneath the tail, which is long and pointed, scarcely differ from the other scales. Example, *Herpeton tentaculatus*.

ERRATIC BLOCKS are those weather-worn fragments of the harder rocks which are found widely scattered over the surface of the earth, and at great distances from the places whence they are supposed to be derived. In size they vary from ten thousand cubic feet and upwards to a few inches. Their distribution and situation are very different. Seldom isolated, they are generally found in groups, or in long bands, widely spread over considerable tracts. Sometimes they cover horizontal plains, sometimes they rest on the sloping sides of mountains, and occasionally on the very tops of lofty eminences. Though generally superficially disposed, they are in some places found imbedded in a fine sand which has nothing in common with their nature or origin.

When the erratic blocks are not at any great distance from the spots whence they came, they may be easily traced up to their origin. Thus those which are in the basin of the Rhine come from the Grisons; those of Zürich and the Limmat have been detached from the mountains of Glaris; those of the basin of the Reuss come from the rocks at the source of this river; and those of the Aar and the Jura from the lofty mountains in the canton of Berne. It is remarkable that the blocks are frequently largest as they are farthest removed from the place whence they came.

Sir R. I. Murchison, from a minute examination of the geology of Russia, has arrived at a comprehensive hypothesis respecting the origin of the erratic blocks in the north of Europe. It is known that these are found in Westphalia, in Mecklenburg, in Russia, in East Prussia, in Scotland, in Norway, Sweden, and Denmark; and Murchison has found that all these groups have to a certain extent, either a radial or a curvilinear direction, which points as a centre to the lofty mountains between Norway and Sweden. He supposes that, at some remote period, a violent upheaval may have scattered water, and water borne blocks on all sides from this centre. There are many blocks among the Alps and Jura mountains, and many theories of their origin by De Luc, Von Buch, Escher, Daubuisson, Dolomieu, Venturi, Forbes, and others.

ERRHINES, medicines which are applied to the nostrils, and which cause an increased flow of the secretion of the membrane which lines them, and often of the contiguous cavities and sinuses; frequently also occasioning sneezing, and an unusual secretion of tears. Snuffs of different kinds are familiar examples of this class of substances, and these generally cause sneezing, at least when first employed; but others, such as the turpeth mineral, merely produce increased secretion of the membrane. Where sneezing ensues, a considerable shock is felt over the whole frame, and of this effect advantage is sometimes taken to change the action of the system, or to remove morbid impressions, as when certain fits are impending, or for more limited purposes, such as dislodging any foreign body from the nose. The secondary effect of errhines is more frequently desired to give relief to the loaded vessels, by exciting them to increased secretion. Hence they are used in various diseased conditions of the organ of smell, and even of the neighbouring organs, being supposed to influence the vessels of the eye, and even of the brain. Some affections of the eye, and also of the head, are certainly relieved by such means, and their occasional use may be permitted; but the habitual use of errhines is in most cases objectionable, and followed by hurtful consequences. The membrane of the nose becomes thickened, its sensibility impaired, and the power of discriminating odours greatly lessened; while if the substance be possessed at the same time of narcotic qualities, such as snuff procured from tobacco, the palate, the stomach, and other organs concerned in digestion likewise suffer, and loss of appetite with other symptoms of indigestion results.

ERROR (in law), a fault in the pleadings, or in the process, or in the judgment, upon which a writ, called a writ of error, is brought. It is the ordinary mode of appeal from a court of record, and is in the nature of a commission to the judges of a court superior to that in which the judgment was given, by which they are authorized to examine the record, and on such examination to affirm or reverse the judgment according to law. For the cases in which this writ is issued, and the courts to which it is directed, see Bac. *Abr.* tit. *Error*.

ERSKINE, EBENEZER, founder of a sect of seceders from the established church in Scotland, called the Secession Church, was born June 22, 1680. He studied at the university of Edinburgh, became a licentiate in divinity in 1702, and in 1703 was chosen minister of Portmoak in the shire of Kinross; whence in 1731 he removed to a charge in the town of Stirling. The secession of the body headed by Mr. Erskine was occasioned by the operation of the Act of Queen Anne restoring lay patronage in the church of Scotland. The presbytery of Kinross, led by Erskine's brother Ralph, had refused to induct a presentee forced on an objecting congregation by the law of patronage. In 1732 the General Assembly enjoined the presbytery to receive the presentee; and passed an act of Assembly regulating inductions. Against this act Mr. Erskine preached, for which it was decided by the Assembly that he should be 'rebuked and admonished,' and finally he was suspended from his functions. Erskine and his friends, including his brother Ralph, formally seceded in 1736. [SECEDERS.] When the Secession was divided into the two sects of Burghers and Anti-Burghers, Mr. Erskine and his brother were of the party of the former. He died June 22 1756. Brown,

Historical Account of the Secession: Chambers, *Lives of Eminent Scotsmen.*)

ERSKINE, RALPH, author of 'Gospel Sonnets,' and other religious works, was born March 18, 1685, and died November 6, 1752. He was minister of Dunfermline, and his celebrity chiefly rests on his alliance with his brother Ebenezer in founding the sect of the Seceders in Scotland.

ERSKINE, JOHN, was born in the year 1695. His father was the honourable John Erskine, son of Lord Cardross, and he was thus the cousin-german of Lord Chancellor Erskine. Erskine's like was that of a recluse student. In 1719 he became a member of the faculty of advocates, but he does not appear to have had much practice. In 1737, he was appointed professor of Scots Law in the university of Edinburgh. In 1754, he published 'Principles of the Law of Scotland,' in one volume 8vo., a work remarkable for its lucid arrangement, and for the terseness and clearness of its exposition of the leading principles of the law. It passed through several editions, the last of which was edited in 1827 by Professor More. Erskine retired from his professorship in 1760, and died at his own estate of Cardross in 1765. He had employed his years of retirement in expanding the matter of his 'Principles' into a larger work, which he left behind him nearly finished, and which was published in 1773, in two volumes folio, with the title of 'An Institute of the Law of Scotland.' This work has been repeatedly republished with notes, bringing down the law to the dates of the respective editions. It is the great authority of Scottish law. Owing to the late increase of commerce and manufactures in Scotland, the portion relating to these subjects is meagre and antiquated. In all things however relating to the rights of persons arising from their relation to each other, and in the peculiar rules of the feudal system in Scotland, the work is still of great value.

ERSKINE, JOHN, son of the preceding, was born on June 2, 1721. He was licensed as a preacher in 1743, and in 1744 obtained the charge of the parish of Kirkintilloch, near Glasgow. In 1763 he received the degree of D.D. from the university of Glasgow. In 1767 he was appointed one of the ministers of the collegiate church of the Greyfriars in Edinburgh. He had for his colleague Dr. Robertson the historian, who was leader of the moderate party in church politics, or that body which had the least affection for the predominant characteristics of the Presbyterian creed and polity, while Erskine was the leader of the evangelical and popular, or as it was sometimes called Orthodox party—the same which lately seceded from the church of Scotland, and formed the 'Free Church.' Erskine was an active popular preacher and leader, and the titles of the books and pamphlets written by him would fill a considerable space. He died Jan. 19, 1803. (*Account of the Life and Writings of John Erskine*, by Sir Henry Moncrief Wellwood.)

ERSKINE, THOMAS, LORD, was the third and youngest son of David earl of Buchan. He was born in January 1748, and received the rudiments of his education partly in the high-school of Edinburgh, and partly at the university of St. Andrews. In 1764 he entered the navy as a midshipman, but in 1768 he accepted a commission in the first regiment of foot, and subsequently went with his regiment to Minorca. In 1775, at the solicitation of his mother, but it is said against his own judgment, he commenced the study of the law, and entered himself a student of Lincoln's Inn. He became the pupil of Mr. Buller, and afterwards of Mr. Wood, both of whom were subsequently raised to the Bench. In Trinity term, 1778, Mr. Erskine was called to the bar, and his success was rapid and brilliant. In the same term he was employed as one of the counsel for Captain Baillie, lieutenant-governor of Greenwich Hospital, who was prosecuted for an alleged libel on the other officers of that establishment. The prosecution was in fact instituted by Lord Sandwich, then at the head of the admiralty, who had abused the charity by appointing landsmen as pensioners to serve his own electioneering purposes. Mr. Erskine's eloquent and indignant speech at once established his reputation. In 1783, when he had been scarcely five years at the bar, he received a patent of precedence at the suggestion of Lord Mansfield, who then presided in the Court of King's Bench. In the same year Mr. Erskine was returned member for Portsmouth, through the interest of Mr. Fox, but in the House of Commons his success by no means equalled the expectations which his friends had formed, though his parliamentary speeches would appear to have been far above mediocrity. In the same year also he was made attorney-general to the prince of Wales, an appointment which he was called upon to resign in 1792, in consequence of his refusing to abandon the defence of Thomas Paine when he was prosecuted for his publication 'The Rights of Man.' In 1802 he was made chancellor of the Duchy of Cornwall; and in 1806, on the formation of the Grenville ministry, he was appointed lord chancellor, and raised to the peerage by the title of Baron Erskine. He was ill fitted for the judicial duties of the chancellorship. On the dissolution of the ministry in 1807, he retired from public life. In 1820 he took a prominent part in the House of Lords on the occasion of the trial of Queen Caroline.

In the later years of his life he was harassed by pecuniary embarrassments. His first wife died in 1805, and he subsequently married again. He died Nov. 17, 1823.

Lord Erskine's talents were peculiarly those of an accomplished and dexterous advocate: his addresses to juries captivated their understandings, their imaginations, and their passions; they were marked by strength, vigour, and simplicity, and a perfect freedom from colloquial vulgarisms. His extraordinary talent was developed by the circumstances of the times; his indignant eloquence was called forth in defence of those individuals in whose persons the government attacked the liberty of the press and constitutional freedom. The public mind was in a state of ferment from the recent events of the French revolution. As counsel for the defendants in these political prosecutions, Lord Erskine made his noblest and most success-

ful efforts. Fearless and zealous in the cause of his client, he spoke home truths without using unnecessary violence or low invective.

Lord Erskine's principal writings are—the Preface to Fox's Speeches, the political romance called 'Armata,' and a pamphlet entitled 'View of the Causes and Consequences of the War with France,' which passed through 48 editions. His 'Speeches' have been published in 5 vols. 8vo.

Notices of the life of Lord Erskine are published in Lardner's 'Cyclopædia' (Lives of British Lawyers') Campbell's 'Lives of the Lord Chancellors;' and in the third vol. of the 'Gallery of Portraits,' from which this account has been taken. There are various remarks upon him in Romilly's 'Memoirs.' His statue is in Lincoln's Inn Hall.

ERSTEIN. [RHIN, BAS.]

ERU'CA, a genus of plants belonging to the natural order *Cruciferæ*, and to the tribe *Brassicaceæ*. The species are annual branched herbs, with erect terminal racemes of flowers, which are white and yellow, and remarkable for their beautiful reticulation of brown veins. *E. sativa*, Garden Rocket, is a native of cultivated fields and waysides in the north of Africa, in Spain, Portugal, France, Italy, Switzerland, and Greece. It is very subject to varieties, and many have been described by various botanists. Although mostly hairy, sometimes its stem is smooth. In height it varies from three inches to two feet, and the flowers are very variable in the depth and arrangement of their colours. When full grown it has an acrid and unpleasant taste, and a strong, peculiar, almost fetid smell; but when young and tender, it is frequently eaten as a salad, especially on the Continent. *E. hispida* and *E. vesicaria* are European species of this genus.

ERUCASTRUM, a genus of plants belonging to the natural order *Cruciferæ*, and to the tribe *Brassicaceæ*. *E. incanum*, the *Sinapis incanus* of Linnæus, has been found in sandy places in Jersey and Alderney, and has consequently a place in the British Flora.

ERUPTION. [VOLCANO.]

ERY'NGIUM, a genus of plants belonging to the natural order *Umbelliferæ*, and the tribe *Saniculeæ*. The species are usually perennial spiny herbs, with the flowers congregated into oblong or roundish dense heads. *E. maritimum*, Sea Holly, is a native of Europe, on the sands of the sea-shore, and is found on the European and African shores of the Mediterranean Sea. It is abundant on the eastern shores of England, and is found in Scotland and Ireland. The plant is called in England Sea Eryngo, Sea Hulver, and Sea Holme. According to Linnæus the flowering shoots are very good when boiled and eaten like asparagus. The leaves are sweetish, with a warm aromatic flavour. The root also is sweet to the taste, and has an aromatic smell. It has been used in medicine as a tonic, and Boerhaave regarded it as a valuable aperient and diuretic. The root is candied, and is sold in the shops of London as a sweetmeat. *E. campestre* is a more bushy and slender plant than the last. It grows on waste ground, and in dry sandy fields, and is a very common plant in the south of Europe. It is found in England and Scotland, but is a rare plant. *E. fœtidum* is a native of Jamaica, Cayenne, Demerara, Florida, and Brazil, in fields and woods. The negroes and poorer whites in Jamaica regard this plant as a valuable remedy in hysterical fits; hence in the West Indies it is called Fitweed. It is administered in the form of a decoction or infusion of the whole plant. *E. aquaticum*, Rattle-Snake Weed, is a native of North America, from Pennsylvania to Virginia. It is also found in the Society Islands, California, and Buenos Ayres. It inhabits marshes, inundated pastures, and the banks of rivers. This plant is employed in North America as an application to the bite of a rattle-snake; hence its common name. Nearly one hundred species of this genus have been described. They are found chiefly in America, and are most of them handsome and ornamental plants, and worthy of cultivation.

E'RYON, Desmarest's name for a macrourous crustacean known only in a fossil state. He observes, that this extinct species is entirely anomalous, and ought in natural classification to form a section by itself. Only one species has been discovered, viz. *Eryon Cuvieri*. It occurs in the lithographic limestone of Pappenheim, in Bavaria, and in the Margraviate of Anspach. The carapace is finely granulated above, marked by two deep and narrow notches on the two latero-anterior borders, and finely crenilated on the latero-posterior borders. Chelæ slender and feeble. Length, four to five inches.

ERY'SIMUM, a genus of plants belonging to the natural order *Cruciferæ*, and to the tribe *Sysimbreæ*. The species are annual, biennial, or perennial herbs, with variable leaves, and elongated, terminal, many-flowered racemes. *E. alliaria*, is now admitted as the type of a new genus, *Alliaria* of Adanson. It is a native all over Europe, under hedges and in ditches. It has a strong smell, and a taste not unlike garlic, for which it is frequently used as a substitute, whence it has obtained its Latin name Alliaria, from *allium*, garlic. It is very generally used by the poor people of the countries in which it grows as a condiment, with bread and butter, salted meats, or in salads. Linnæus says that sheep and cows and poultry eat it, but that horses and goats refuse it. When eaten by cows it gives a disagreeable flavour to the milk. Poultry also which eat it have a bad flavour when cooked. The seeds, when powdered, produce sneezing, and have been employed as a sternutatory. *E. cheiranthoides*, Worm-Seed, Treacle-Mustard, is a native of Europe, and also of North America. It is found not uncommonly in Great Britain; it inhabits cultivated ground, waste places, and osier holts. It varies greatly in size, according to situation. The flowers are very numerous, small, and yellow. It has obtained its name Worm-Seed from the fact of its seeds being sometimes used as a remedy for intestinal worms. It was also formerly employed as an ingredient in the famous Venice treacle, and hence the whole genus has been called Treacle-Mustard. *E. virgatum* is found in Great Britain, plentifully near Bath. It is also a native of the

Alps and of Holland. *E. orientale* is a native of the south of Europe, and is found in England and Ireland, in fields and cliffs near the sea. It has white or cream-coloured flowers. There are about fifty species of Erysimum, most of them natives of Europe, and a few of the temperate districts of Asia, Africa, and America. Some of them are ornamental and worthy of cultivation.

ERYSI'PELAS (*Ignis Sacer, the Rose, St. Anthony's Fire*), an inflammation of the skin, occasioning a spreading redness, which occupies a broad surface, on which are formed vesicles or blisters, preceded by and accompanied with fever. The whole of the inflamed surface is painful, but the pain is not acute; it is rather a sensation of burning or stinging than of severe pain. The redness is not intense like that produced by phlegmon or boil, but is of a pale rose colour. There is always considerable tumefaction; the tumour is not surrounded by a definite boundary, but is diffuse, irregularly circumscribed, and unattended with a sensation of throbbing. The tumour is often soft and boggy. It is characterised by the vesications which form upon it.

The proper seat of erysipelas is the skin, but the appearance of the disease is somewhat modified according to the part of the skin which is more especially inflamed.

Erysipelatous inflammation is characterised by its tendency to spread, and thereby to cover a considerable portion of the external surface of the body. It creeps on in succession from one part of the skin to another until it extends to a great distance from the part originally attacked, the inflammation often disappearing from the former as it becomes established in the latter. Erysipelas most commonly attacks the face, but it sometimes seizes on one of the extremities: the disease is always more severe when it attacks the head than when it is seated in any other part of the body.

An attack of erysipelas comes on either with chills or a distinct cold shivering, attended with a sense of lassitude, aching in the limbs, restlessness, and that disordered state of the skin which has been expressively termed febrile uneasiness. There is from the beginning uneasiness or confusion in the head, which soon amounts to decided pain. This is accompanied with such a degree of drowsiness, that the attack may sometimes be predicted long before there is any appearance of redness or swelling in the face, from the inability of the patient to keep himself awake. The chilliness is soon succeeded by heat of skin; the appetite fails, the bowels are constipated, the tongue is dry and parched, there is sometimes nausea and vomiting; the pulse is always frequent, sometimes full, soft and compressible, but occasionally hard and tense.

The progress of the disease is more or less rapid, and its duration longer or shorter, according to the age, the temperament, and the vigour of the individual. In the young, the sanguine, and the robust, the tumefaction is sometimes fully formed on the second day, and the whole terminates on the sixth or seventh, while in the aged and the less vigorous it may be protracted to the tenth or twelfth, and the desquamation may not be completed before the fourteenth day. The average duration of the disease may be stated to be from eight to ten days. When the fever and inflammation are intense, delirium comes on, which sometimes rapidly passes into coma.

When death does not take place, the inflammation, after having affected a part, commonly the whole, of the face, and perhaps the other external parts of the head, ceases. With the inflammation the fever also ceases; and, without any evident crisis, the patient returns to his ordinary state of health.

The exciting causes are exposure to cold and moist air after the body has been previously heated; exposure to sudden and great alternations of temperature; exposure to great heat however produced, whether by the direct rays of the sun or by a fire; intemperance; unwholesome articles of diet, as shell-fish, or stale and rancid fish; rich, oily, fat, or smoked meats; impure states of the atmosphere; an impure state of the body, arising from a morbid condition of the blood, in consequence of the suppression of its depurating processes, whence the frequent occurrence of the disease in the advanced stages of fever, greatly complicating the state of fever and exhausting the little remaining strength of the patient. Violent emotion of mind has also been observed to be an exciting cause of erysipelas in those powerfully predisposed to the disease; in whom also local irritants often induce it, as wounds or punctures in the skin, the bites of leeches, the stings of insects, inoculation with variolus or vaccine matter.

In the phlegmonous species, characterised by the presence of inflammatory fever, the method of treatment must be widely different from that proper to the œdematous and gangrenous, in which there is the very opposite state of the system. In the young, the plethoric, the sanguine, and the robust, at the commencement of the attack, when there is much pain in the head, when the heat of the skin is intense, and the pulse is full and strong, the remedies proper in any other case of inflammatory fever are required; namely, bleeding to the extent of the subdual of the inflammatory condition of the system. In an ordinary attack of phlegmonoid erysipelas, general bleeding is not necessary, at least in the constitutions commonly found in a crowded city. Moderate purging, diaphoretic and saline medicines, strict confinement to bed in a cool apartment, with the diet appropriate to febrile diseases, are all the remedies required. If local bleeding and blistering appear to be indicated, care must be taken not to apply the leeches or the blister near the inflamed surface.

In the œdematous species, when it occurs in broken-down constitutions, the result of habitual intemperance, even purgatives must be very cautiously administered; the strength must be sustained by mild nutritive diet, and tonics, as cinchona or quinine, and even stimulants, as camphor, wine, or the beverage to which the patient has been habituated, are required. The aperients employed should be mild alterative mercurials, with equal parts of castor oil and the spirit of turpentine administered perhaps every alternate morning.

In the gangrenous species, quinine in considerable doses through the whole course of the disease, opium, camphor, the mineral acids, wine, brandy, and the general regimen adapted to gangrenous affections occurring under other circumstances, must be freely employed.

ERYTHE'MA, a superficial redness of some portion of the skin, varying in extent and form, attended with disorder of the constitution, without vesications, and uninfectious. It is distinguished from erysipelas by the slight degree of constitutional disorder, by the slight degree of local pain, by the more uniformly favourable termination of the disease, and by the absence of tumefaction and vesication.

The primary causes of erythema are the friction of contiguous parts, especially in fat persons; the accumulation of morbid secretions and excretions on the skin, as the matter of the perspiration, of the leucorrhœal discharge, of the catamenia, and of the alvine and urinary evacuations, in the adult in the course of other diseases, and in the infant in consequence of a want of proper ablution. It is also constantly produced by irritating articles of food and drink, and is the sign and the result of a disordered state of the digestive organs.

In most cases the affection disappears soon after the removal of the cause which produces it —by free ablution where it is the result of irritating matters on the skin, and its disappearance is assisted sometimes by the application of an absorbent powder to the inflamed surface, and at other times by the use of a gently stimulating lotion, as the spirit wash. When the disease is dependent on a disorder of the digestive organs, it can be removed only by the remedies proper for the removal of the stomachic, the hepatic, or the intestinal derangement. For the restoration of these organs to their sound condition, the most appropriate remedies are light diet, diaphoretics, the mercurial alteratives in combination with gentle aperients, and the mineral acids as tonics.

(Bateman's *Practical Synopsis of Cutaneous Diseases*; Copland's *Dictionary of Practical Medicine*.)

ERYTHRÆA, a pretty genus of annual plants, belonging to the natural order *Gentianaceæ*, and inhabiting dry sandy places in Great Britain and other parts of Europe, especially near the sea. They are extremely bitter, and are collected by country people, under the name of centaury, as a substitute for gentian, in domestic medicine. English botanists reckon four supposed species.

Erythræa centaurium, Lesser Centaury, an indigenous plant, common by way-sides and edges of fields, flowers in August, at which time it is to be collected. It contains a principle called *Centaurin*, which at present is known only as a dark brown extract-like mass; but which, united with hydrochloric acid, furnishes an excellent febrifuge medicine.

ERYTHRIC ACID, a substance regarded by Dr. Prout as a compound of nitric and purpuric acid and ammonia.

ERYTHRI'NA, a leguminous genus of tropical trees and tuberous herbs, with bright red flowers. Frequently the stem is defended by stiff prickles. They occur in the warmer parts of the Old and New World. An Indian species, *E. monosperma*, is said to yield gum-lac.

ERYTHRO'NIUM (Dens Canis), a pretty little bulbous plant, the name of which, translated into English, Dog's Tooth Violet, is derived from the form of its long slender white bulbs. It is a native of woody subalpine places among bushes and stones, in Croatia, at Idria, and about Laybach. It also occurs in Switzerland, but more seldom, and is also met with in the north of Italy. It is not mentioned in the Floras of the south of Europe. Two or three varieties are known in gardens as gay hardy flowers appearing early in the spring; one with purple flowers, a second with white, and a third, elevated by some into a species, with a somewhat stronger habit of growth.

ERYTHROXY'LEÆ, a group of exogenous plants, considered by some as a distinct natural order; by others as a subordinate division of *Malpighiaceæ*. Some of the species of *Erythroxylon*, the only genus, have a bright red wood, occasionally used for dyeing; but the most extraordinary species is the *Erythroxylon coca*. [COCA.]

ERYX or ERIX, a genus of serpents separated by Daudin from *Boa*, and differing from the latter in having a very short obtuse tail, and the ventral plates narrower. The head of Eryx is short, and almost unseparated from the body (à peu près d'une venue avec le corps). In these characters it approaches *Tortrix*, but the conformation of the jaws places it at a distance in natural arrangement. The head is covered with small scales only, and there is no hook at the vent. Example, *Eryx Bengalensis*.

ERZERU'M, a town in Turkish Armenia, stands in a vast high plain near the left bank of the Kara-Su, a feeder of the Euphrates, in 39° 57′ N. lat., and about 41° 15′ E. long. The town, which is entered by 4 gates, is very large, and is partly surrounded by an old castellated wall, and on its southern skirts stands a citadel encircled by a double wall flanked with towers. The houses for the most part are low, and built of wood, but the bazaars are extensive, and well supplied with provisions. Erzerum has nearly forty mosques, several khans, a Greek church, and a large Armenian chapel. The population was estimated in 1827 at 130,000. But the town being soon afterwards occupied by the Russians, the greatest part of the inhabitants abandoned it. Since its restoration to the Turks by the peace of Adrianople the place is slowly rising from its state of decay, and the population is now stated at 30,000. Before the Russian invasion considerable quantities of silk and cotton cloth were made here, and much leather tanned; there were also some manufactures of copper vessels.

Erzerum is important as a commercial town. Besides the produce of its manufactures it exports corn, cattle, sheep, and dried meats. But it derives other commercial advantages from its being situated on one of the most frequented caravan roads of Western Asia, which leads from Persia and Georgia to the great commercial towns of Asia Minor. This renders Erzerum an important place also in a political and military point of view. It

is the seat of a pasha, and the pashalik yields only in rank and extent to that of Bagdad. A British consul resides at Erzerum.

(Kinneir; Brant, in *London Geogr. Journal*, vi.; Macgregor's *Statistics*.)

ERZGEBIRGE (the Ore Mountains) is a mountain-range in Germany, extending along the boundary line of the kingdoms of Bohemia and Saxony. It begins about 25 miles S.E. of Dresden, on the banks of the Elbe, and extends in a west-south-west direction to the sources of the Weisse Elster, about 12° 30′ E. long., where it is connected with the Fichtel-gebirge. The river Elbe divides its eastern extremity from the mountains of Lausitz. The highest part of the range, which is towards its southern border, forms partly the boundary line between Bohemia and Saxony, but is mostly within the former kingdom. Its southern declivity, which is steep and intersected with narrow valleys, terminates in the valley of the river Eger, about 10 or 15 miles from the upper range. The northern declivity of the range descends in more gentle slopes towards the great plain of northern Germany; and these slopes are divided from one another by wide and open alleys. A line drawn through Pirna on the Elbe, Chemnitz, and Reichenbach, indicates with tolerable correctness where the range on this side ceases. The higher slopes of these mountains are covered with extensive forests, which furnish fuel for the great smelting works in connection with the numerous mines of the region. Metals of almost every kind are found. Of its mineral and other products notice is taken in ERZGEBIRGISCHE-KREIS. The whole length of the range is about 100 miles, and its mean breadth as indicated is about 35.

The range of the Erzgebirge belongs to the primitive formation, granite and gneiss being everywhere prevalent, except along the Elbe, where sandstone almost exclusively occurs. The highest summits occur about 13 E. long. Here are the Keilberg, 4212 feet above the sea, the Fichtelberg, 3968 feet, the Schwarzberg, 3988 feet, and the Hassberg, 3248 feet. Farther east and farther west the range gradually sinks lower, the Great Chirnstein, on the banks of the Elbe, rising only to 1824 feet above the sea.

ERZGEBIRGISCHE-KREIS (Circle of the Ore Mountains), a province of the kingdom of Saxony, is bounded S. by the main branch of the Erzgebirge mountains, which separates it from Bohemia; N. by the circle of Leipzig and the duchy of Saxe-Altenburg; W. by Saxe-Weimar, the principality of Reuss, and the circle of Voigtland; and E. by the circle of Meissen. It contains a population of 560,000, and an area of 1760 square miles, on which there are 58 towns, 13 market villages, and above 700 villages and hamlets. The province is intersected in all directions by offsets from the Erzgebirge, and presents a constant succession of hills and valleys. The loftiest heights in it are the Fichtelberg, at the southernmost extremity of the province, which is 3968 feet, and the Auersberg, about 11 miles north-west of the Fichtelberg, which is 3132 feet above the level of the sea. The Eastern and Western Mulde, the Zschoppau, Flöhe, Pöhl, Sehm, Bockau, Chemnitz, Westritz, and the Pleisse, are the principal rivers. There are a number of mineral springs. The province is full of woods and forests, particularly in its most elevated parts.

The rugged character of the surface and the coldness of the climate are unfavourable to agriculture. Oats, rye, linseed, potatoes, and a small quantity of wheat, are cultivated; but the produce not being sufficient for the consumption, large importations of bread-stuffs are made from Bohemia and the circle of Leipzig. There are extensive pastures in the vicinity of Zwickau, Chemnitz, Freiberg, and Nossen, where large flocks of sheep are kept; but cattle-breeding is not so actively carried on as it might be.

The name of the circle indicates the peculiar character of its natural riches. It abounds in mines of silver, tin, lead, iron, cobalt, copper, &c., which afford employment to upwards of 200,000 persons. The silver mines are at Schneeberg, Schwarzenberg, Annaberg, and Marienberg. The most considerable tin mines are at Altenberg, Geier, and Schneeberg. The most productive iron mines are those of Johann-Georgenstadt. Near Aue and Bockau, to the south of Schneeberg, lie the largest cobalt mines, and smalt (or blue-colour) works in Germany; of these smalts the yearly produce is between 9000 and 10,000 cwts., besides large quantities of arsenic, &c. The white porcelain earth used in the royal china manufactory at Meissen is procured and prepared in this district. Sulphur and vitriol are made at and near Beierfeld and Geier: magnesia and porcelain earth are obtained at Elterlein; and there are coal mines of importance at Planitz, and other spots near Zwickau. Gold is found in some places, but no mines are worked.

Besides considerable manufactures of iron, tin, steel, and copper ware, the province has extensive manufactures of thread, twist, linen, cotton goods, woollen cloths, flannel, woollen stockings, bobbinet, tape, ribands, &c.

The province is divided into 4 districts, Chemnitz, Zwickau, Wolkenstein, and Freiberg. The district of Chemnitz, in the north, contains the towns of CHEMNITZ; Frankenberg, on the Zschoppau, 5200 inhabitants; Oederan, 3100; Zschoppau, on the river of that name, 5100; Lössnitz, 4400; Glauchau, on the Western Mulde, with 5300 inhabitants; Hohnstein, 3800; Waldenburg, on the Western Mulde, 4500; Penig, on the same river, 3100; and St. Merane, 2300. The district of Zwickau, in the west and south-west, contains Zwickau, on the Western Mulde, with 7400 inhabitants and large woollen manufactories; Werdau, on the Pleisse, 3600; Johann Georgenstadt, on the Schwarzwasser, 2700; and Schneeberg on the Schleenerbach, 5800. The district of Wolkenstein, in the south, contains the towns of ANNABERG; Wolkenstein on the Zschoppau, 1600 inhabitants; Geyer on the Pleisse, 2600; and Stollberg, 3050. The district of Freiberg, in the east, contains FREIBERG; Haynichen, 3000; Nossen, on the eastern Mulde, 1200; Rosswein, on the same river, 3500; and Altenberg, 1600.

ESCALLONIA'CEÆ, a small natural order of exogenous plants, related to the genus *Ribes*, in the opinion of some botanists, but to that of *Saxifraga*, according to others. It consists of shrubs with evergreen leaves, which often emit a powerful odour like that of melilot. Their flowers are red or white. All the species inhabit South America, on the high grounds, especially in alpine regions. *Escallonia rubra*, *montevidensis*, *illinita*, and others, have now become common in warm sheltered gardens in this country.

ESCAPEMENT. [HOROLOGY.]

ESCARP, or SCARP, in fortification, is that side of the ditch, surrounding or in front of a work which constitutes the exterior of the rampart. In field-works the escarp is usually formed by cutting the earth at such an inclination as will permit it to support itself: but, in large fortresses the escarp is the exterior surface of the revetment wall which supports the rampart. [REVETMENT.]

ESCARPMENT, a precipitous side of any hill or rock. In military operations ground is frequently scarped, as it is called, or cut away nearly vertically about a position, in order to prevent an enemy from arriving at the latter. Part of the rock of Gibraltar has been rendered inaccessible in this manner.

ESCHAROTICS are agents applied to the surface of the body, which destroy the vitality of the part which they touch and produce an eschar. They are classed under two heads, the *potential cauterants*, and the *actual cautery*. The former are chiefly chemical agents. The actual cauterants are substances of an elevated temperature, which decompose the part which they touch, and completely destroy its organization. The chief potential cauterants are strong mineral acids, such as the sulphuric or nitric, pure alkalies, and some metallic salts, especially nitrate of silver, or lunar caustic. These are used either to produce counter-irritation, or to remove fungous or morbid growths. Lunar caustic seems to possess peculiar properties, and is unquestionably the most powerful direct antiphlogistic agent known. If applied in the solid state to many inflamed parts it speedily checks the morbid action, and is decidedly the best application to chilblains, and in leucorrhæa. The actual cauterants are used either for their primary action, viz. the immediate destruction of the part, or for their secondary effects. The former object is rarely attempted, except to prevent the absorption of any poisonous or contagious matter, such as the venom of a snake, or bite of a mad dog. The secondary effects are more important, and more varied according to the degree of heat of the substance applied. The increased action is frequently felt through the whole frame. Torpor and paralysis of the nervous system often disappear, and neuralgia both of the neighbourhood and even distant parts is removed. Atony and laxity of the muscular system vanish, and every part displays more energy and power. The actual cautery may be applied in a variety of ways, viz., hot water, hot vapour, moxa, and heated iron. The first of these is a very ready means of causing vesications in some diseases.

The eschar which follows the application of the potential or actual cautery generally suppurates in a few days. The ulcer is then to be treated with different agents, according as it is wished to heal it or keep it open, as a farther means of counter-irritation.

ESCHEAT is from the Norman French *eschet*, which is from the word *eschier* or *eschoir*, 'to fall;' for an escheat is a casual profit, which falls to the lord of a fee.

An escheat may happen in two ways, for want of heirs, or for the crime of the tenant. There can only be an escheat of the whole fee; and this happens when the tenant of lands in fee simple dies intestate and without an heir: the lands, if freehold, escheat to the king, or other lord of the fee; if copyhold, to the lord of the manor. Since the 1st day of January, 1834, there can be no escheat on failure of the whole blood, wherever there are persons of the half-blood capable of inheriting under 3 & 4 Wm. IV. c. 106, sect. 9.

If a bastard dies intestate and without issue, his lands escheat to the lord of whom they are held. Escheats for crime may happen in consequence of a man being attainted for treason or felony, by which he becomes incapable of inheriting from any of his next of kin, or transmitting an inheritance to them. This is the consequence of attainder and the legal corruption of blood. The 3 & 4 Wm. IV. c. 106, sect. 10, somewhat modifies the old law, so as to prevent escheat in some cases. [ATTAINDER.]

By the 4 & 5 Wm. IV. c. 23, no property vested in any trustee or mortgagee shall escheat or be forfeited by reason of the attainder or conviction for any offence of such trustee or mortgagee, except so far as such trustee or mortgagee may have a beneficial interest in the property.

In 1838 an act was passed (1 & 2 Vict. c. 69) for removing doubts which had arisen respecting the acts 1 Wm. IV. c. 60, and 4 Wm. IV. c. 23, with reference to mortgagees.

The words Escheat and Forfeiture are often carelessly used. Escheat arises solely because there are no heirs to take the land, for one or the other of the two reasons stated above. Forfeiture is a direct consequence of an illegal act. [FORFEITURE.]

ESCHEATOR, an ancient officer appointed by the lord treasurer, and so called because his office was to look after escheats, wardships, and other casualties belonging to the crown. This office no longer exists.

ESCHSCHOLTZIA, a genus of beautiful yellow-flowered papaveraceous plants, inhabiting California and the north-western coast of North America, and now become extremely common in the gardens of Great Britain. Two certain species only, *E. Californica*, and *E. crocea*, have yet been introduced: a third, *E. compacta*, is probably a mule between these two.

ESCHWEGE. [HESSE-CASSEL.]

ESCORIAL, or ESCURIAL. [CASTILLA-LA-NUEVA.]

ESCUAGE, or SCUTAGE, a pecuniary payment, as a commutation for knight-service, by which service the tenant was bound to follow his

lord to the wars at his own charge. The term escuage or scutage is from the old French *escu*, and that from the Latin *scutum*, 'a shield;' a name also given to coins on which there was the shield or escutcheon of the sovereign. By the 25 Edw. I. c. 5 and 6, and subsequent statutes, it was enacted, that the king should take no aids but by the common assent of the realm. These scutages seem to be the origin of all succeeding subsidies, and of the land-tax of later times.

ESCULAPIUS. [ÆSCULAPIUS.]

ESCULIC ACID, a peculiar acid procured from horse-chestnuts. It is colourless, insoluble in water, and forms with bases salts termed *Esculates*.

ESCUTCHEON or ESCOCHEON, the heraldic term for the shield, on which, under every variety of shape, arms are emblazoned. The word is derived from the French *écusson*, and that from the Latin *scutum*. An *escutcheon of pretence* is the small shield in the centre of his own, on which a man carries the coat of his wife, if she is an heiress and he has issue by her. In this case the surviving issue will bear both coats quarterly.

ESOTERIC. [EXOTERIC.]

ESOX, a genus of the family *Esocidæ*, abdominal Malacopterygii, thus characterized: 'Head depressed, large, oblong, blunt; jaws, palatine bones, and vomer, furnished with teeth of various sizes; body elongated, rounded on the back; sides compressed, covered with scales; dorsal fin placed very far back over the anal fin.' To this genus belong the true or fresh-water pike (*Esox lucius*), noted for its voracity and destructive habits. Pikes are the longest-lived and largest of fresh-water fishes, and many wonderful stories are narrated of them. Gesner gives an account of one, the skeleton of which was preserved at Mannheim, which weighed 350 pounds, and was probably more than 100 years old. Pennant informs us of one ninety years old; and pikes from fifty to seventy pounds weight have been taken in Scotland and Ireland. The pike grows with great rapidity, attaining a length of from eight to ten inches in its first year. The Mannheim pike was said to have been nineteen feet in length, and in our own country they have been taken nine feet long. The pike eats up everything eatable which comes in its way. Being strong, swift, and courageous, it masters all other fishes in its locality. It will also attack birds and small quadrupeds, if within reach, and has been known to quarrel with the otter for its prey, and to assault man himself. Pikes are found in Europe, Asia, and North America. In the United States several species are common.

ESPALIER, a trellis for training fruit trees or bushes upon, instead of nailing them to walls.

In certain situations this kind of training is not only extremely neat, but possesses peculiar advantages: the trees are more fully exposed to the influence of light, less liable to be broken by high winds, and in small gardens in particular, where room is of great importance, and where a collection of the finer sorts of fruit is always desirable, it is found highly useful, both on account of the small space which the trees occupy, and because they will bear fruit much sooner than when allowed to grow in their natural form.

The stakes which form the espalier are made of different materials, some of wood, others of wire and wood, and some of cast iron. The first of these is by far the most simple, and is composed of stakes, five or six feet in height, driven into the ground from one to two feet apart; along the top a bar, which is nailed to each, connects the whole together. It is of no use to have the stakes either so strong or so high when the trees are first planted, because they are not required, are unsightly, and will have to be renewed before the trees have attained their intended height; for this reason, stakes of a much weaker kind will at first answer quite as well. The wire and wood rail is formed by strong vertical wires, strained from two wooden horizontal rails, which are connected and held fast by wooden posts fixed in the ground. The iron rail is constructed like a common street railing.

The objection to all iron trellises is, that they cut and canker the trees; and when the cheapness of the wooden one is considered, besides the more natural appearance which it presents, it must undoubtedly have the preference.

The best wood for this purpose is young larch, the thinning of plantations.

ESPALION. [AVEYRON.]

ESPIRITU SANTO. [BRAZIL.]

ESPLANADE, the ground between the fortifications of a citadel and those of the town to which it belongs.

ESPRIT, ST. [BAYONNE; LANDES.]

ESQUIMAUX, a nation inhabiting the most northern countries of America. On the eastern coast of America they are met with as far south as 50° N. lat., on the shores of the Strait of Belle Isle, which separates Newfoundland from the mainland of America. They occupy the whole of the great peninsula of Labrador, and the whole eastern coast of Hudson's Bay up to East Main River. On the western side of Hudson's Bay they inhabit the coast north of Churchill River, whence they extend northwards over the Barren Lands to the Great Fish River, on both banks of which river they are found east of 100° E. long. The whole country between this river, the Great Bear Lake, the Mackenzie River, and the Arctic Ocean, is exclusively inhabited by them. The coast lying to the west of Mackenzie River is also in their possession; and they seem to be spread as far as Kotzebue Sound on Behring's Straits. They also occupy Greenland and all the islands between the northern coast of America and the pole, as far as they are habitable.

The Esquimaux rarely exceed 5 feet in height. Their faces are broad and round, their cheek-bones high, their cheeks round and plump, mouth large, and lips thick. The nose is small, the eyes black; and the eyelids being much encumbered with fat, appear very small and deeply seated. The hair is long, lank, and of a jet black colour. The ears are situated far back on the head. Their bodies are square and robust, the chest high, and shoulders very broad. Their hands and feet are small. They are of a deep copper-coloured complexion. They are not without beard, but they pluck it out as soon as it appears. They show a

good deal of ingenuity in making their dresses and instruments.

Their language is different from that spoken by the other savage nations who inhabit North America; but the same language is spoken by all the different tribes of the Esquimaux, though of course each of them has expressions which are peculiar.

ESQUIRE (from the old French *écuier*, or shield-bearer) is the next title or dignity to that of knight. The esquire was the second in rank of the aspirants to chivalry, or knighthood, and had his name from carrying the shield of the knight, whose bachelor, or apprentice in arms, he was. The esquire was a gentleman, and had the right of bearing arms on his escutcheon or shield; he had also the right of bearing a sword, which denoted nobility or chivalry, though it was not girded by the knightly belt; he had also a particular species of defensive armour, which was distinguished from the full panoply of the knight. This is the esquire of chivalry, which order is only preserved in the almost obsolete esquires for the king's body, whom antiquaries have pronounced to be the king's esquires in chivalry (that is, his esquires, as being a knight), and in the esquires of knights of the Bath.

The sons of younger sons of dukes and marquisses, the younger sons of earls, viscounts, and barons, and their eldest sons, with the eldest sons of baronets, and of knights of all the orders, are all said to be esquires by birth, though their precedence, which differs widely, is regulated by the rank of their respective ancestors. Officers of the king's court and household, and of his navy and army down to the captain inclusive, doctors of law, barristers, and physicians, are reputed esquires. The general assumption of this title by those who are not, in strictness, entitled to it, has virtually destroyed it as a distinct title or dignity. It is now usual to address most people as esquires on the outside of a letter; but, even in this practice and other cases, the title is not generally given to inferior tradesmen and shopkeepers.

ESSAYISTS, BRITISH. This title is customarily confined to a certain class of periodical writers upon subjects of general interest, as morals, criticism, manners, &c. The notion of a series of papers fit for general circulation, and not including news or politics, was originated by Steele and Addison in the 'Tatler.' [ADDISON.] The 'Freeholder,' 'Craftsman,' 'Freethinker,' &c., were rather political pamphlets than essays in this sense of the word. We give a list of those contained in Chalmers's collective edition of British Essayists, with the names of the principal and most celebrated contributors to each.

'Tatler'—Steele, Addison.

'Spectator'—Addison, Steele, Budgell, &c.

'Guardian'—Steele, Addison, Berkeley, Pope, Tickell, Gay, &c.

'Rambler'—Johnson, almost entirely.

'Adventurer'—Hawkesworth, Johnson, Joseph Warton, &c.

'World'—Moore, Lord Chesterfield, Horace Walpole, J. Warton, &c.

'Connoisseur'—G. Colman and Bonnel Thornton chiefly; Cowper a few.

'Idler'—Johnson; a few by Warton and others.

'Mirror'—Henry Mackenzie and others.

'Lounger'—The same.

'Observer'—Richard Cumberland, almost entirely.

'Olla Podrida'—Moore, &c.

'Microcosm'—Canning, Frere, Smith, &c.

ESSEN. [DÜSSELDORF.]

ESSENCE is derived from the Latin *essentia*, a word which is used by Cicero and Quinctilian, and formed from *essens*, the obsolete participle of the verb *esse*, to be. The English word essence signifies that which constitutes the being of a thing, or, in the words of Locke, that which makes it to be what it is. There has been much dispute on the meaning of this word and on the different meanings of essence and substance. When we meet with the word essence, all that we have to do is to discover, if we can, in what sense it is used: and when we use it, we should be sure, if we can, of the sense in which we use it; and we should use it in no other sense without giving notice.

ESSENES. [HESSENES.]

ESSEQUIBO. [GUYANA.]

ESSEX, an English county, situated on the eastern coast, is bounded E. and S. by the German Ocean and the river Thames, N. by Suffolk and Cambridgeshire, and W. by Hertfordshire and Middlesex. The length, S.W. to N.E., is 63 miles; the breadth, N. to S., at the western extremity, is 37 miles. The area is 1533 square miles, or 981,120 acres. The population in 1841 was 344,979.

Coast, Surface, Rivers, &c.—The bank of the Thames and the sea-coast of Essex are marshy almost throughout. From the sea to Canvey Island there occurs an almost uninterrupted series of marshes and embankments; a few cliffs are found at Leigh, Southend, the Naze, and some other spots; but by far the greater part of the coast is of marshy character. These marshes have distinct names, such as Dagenham, Tilbury, Canvey, Burnham, Southminster, Dengey, Tillingham, and Bradwell marshes.

Many creeks run inland, so as to cut off small portions of the low land, and form them into islands. Among these are Canvey, Russelys, Haven Gore, New England, Potten, Wallasea, Foulness, Mersey, Horsey, Holmes, and Pewit Islands. The largest of these is not more than 6 miles long, by 2 to 3 broad. They are all flat and somewhat marshy.

This county has few hills of any considerable elevation: its general slope is towards the south and east. The chalk downs, which form the continuation of the Chiltern hills, cross the north-western part of the county. The highest hills in the county are—Langdon Hill (620 feet), Danbury Hill (about 600), High Beech (390), and Tiptree Heath.

The rivers of Essex are the following:—The Thames bounds the county on the south side. Its course, though winding, is on the whole nearly from west to east. The Lea bounds the

county on part of its west side. The stream is frequently divided, and flows in several channels, and in some places cuts have been made in order to improve or shorten the navigation. The Stort rises in Hertfordshire, and has a course of 24 miles (of which 10 are navigable), into the Lea. The Roding rises in the western part of the county, and flows past Chipping Ongar, Woodford, Ilford, and Barking, into the Thames. Its course is about 36 miles. The Bourne, after a short course of 12 miles, enters the Thames near Dagenham; it joins a pool formed by Dagenham Breach, where the Thames broke through its banks in 1707, and overflowed 1000 acres of rich land. The Ingerburn, which also joins the Thames, is about 12 miles long. The Crouch rises south of Billericay, and flows E. by N. about 25 miles into the sea. In the tide-way there are many arms; and the various channels by which the river communicates with the sea form the group of Foulness, Wallasea, and the adjacent islands. The Blackwater rises near Saffron Walden, in the north-western part of the county, and flows past Coggleshall, Kelvedon, Witham, and Waldon, into the sea, 46 miles: it receives the Pods Brook and the Chelmer. The Chelmer rises near Debden, and flows about 23 miles to the town of Chelmsford, and 10 more to its junction with the Blackwater. The Colne rises in the north-western part of the county, and flows about 35 miles past Colchester, to the sea near Mersey Island. The Roman flows into the Colne. The Stour divides the counties of Essex and Suffolk. Its course is about 50 miles, past Clare, Sudbury, to the sea at Harwich, near which it joins the Orwell. The Cam has a small part of its course in this county.

Many of the above rivers have been improved for navigation by short canals and deepening. Portions of the Eastern Counties, the Northern and Eastern, and the Eastern Union railways, pass through this county.

Geology, Climate, and Agriculture.—A considerable tract in the northern part of the county is occupied by diluvial beds, consisting of loam with fragments of chalk. The coast of the north-east part is covered with the sand or gravel of the upper marine formation, which occupies a considerable part of the counties of Norfolk and Suffolk, and is locally designated 'crag.' Fragments of fossil bones washed out of the strata of this formation, in which they had been imbedded, are found on the beach at Walton, but occur in much greater quantities at Harwich. The greater part of the county, including Epping and Hainault or Henhault Forests, is occupied by the London clay. The London clay of the cliffs near Harwich contains beds of stratified limestone and several species of fossils. The surface of the vegetable mould does not commonly rest immediately on the London clay, but on alluvial beds of rich marl and loam, which often alternate with gravel and sand, and sometimes have a thickness of 30 or 40 feet. The sands and clays of the plastic clay formation skirt the district of the London clay on the north-west. The north-western extremity of the county, about Saffron Walden, consists of chalk. A subterranean forest underlies the marshes on the banks of the Thames.

The climate of Essex is favourable to vegetation: the sea and the numerous æstuaries which bound it on the south and east soften the rigour of winter, and keep up a certain degree of moisture in summer. The same cause however produces cold fogs and exhalations in spring and autumn. The soil all along the coast, and 10 or 12 miles inland, is of a very excellent quality, being a friable loam peculiarly adapted to the cultivation of wheat, beans, and oats. The best soils of Essex lie low, and require to be protected from the sea by embankments. Many marshes which formerly produced nothing but herbage, and were subject to inundations, are now converted into arable fields. The soil in the uplands along the coast consists chiefly of good loams, varying in tenacity from a strong clay to a light gravel; most of it is of such a nature as to bear both turnips and beans.

The cold wet clays of Essex used to be farmed on a peculiar system; but since the introduction of under-draining, the system is analogous to that of neighbouring counties. The ploughs most commonly in use are Suffolk wheel-ploughs, or swing-ploughs without wheels. After harvest the stubble is generally ploughed in, and before winter the field is laid in narrow ridges, which are formed by two turns of the plough, and sometimes by four turns, or two bouts, as they are called. The most common rotation on the stiffest clays, which will not bear turnips, is now—1, fallow; 2, wheat or barley; 3, clover; 4, oats or wheat; 5, beans; and, where manure is abundant, a second crop of wheat is taken in the sixth year, before the course begins again. On the rich soils, which bear turnips, the usual rotation is turnips, barley, clover, wheat, beans, oats, or wheat. The feeding of oxen in winter is now extensively practised by all good farmers in Essex, whether of strong or light loams. In those farms which have marshes attached to them a great number of cattle is constantly kept. Along the Thames the salt marshes are extensive, and are profitable from the number of horses which are sent to feed there from London. Besides the common crops usually cultivated, considerable quantities of cole or rape-seed, caraway, coriander, and teasels are raised. In that part of Essex which lies within a few miles of London, the cultivation of the soil partakes more of the garden culture. Vegetables, especially cabbages, are raised in great quantities, and very extensive fields are almost entirely devoted to the raising of potatoes.

The cows and horses in Essex are chiefly reared in Suffolk, and Scotland supplies the oxen to fatten. Many calves are fatted, which are killed in the county, or go to London by railway. Essex is not a sheep-breeding county, although many fine lambs are reared; but they are generally bought from the breeders in Wiltshire or Sussex in autumn, and sold fat to the butcher in the succeeding spring. There is no peculiar breed of horses. Essex has been long noted for a superior breed of pigs, which has been produced and improved by crosses with foreign breeds, chiefly

the Neapolitan, which has very little hair, and the Chinese.

Divisions, Towns, &c.—Essex is divided into 20 hundreds. It is in the diocese of Rochester, except 10 parishes, which are in the diocese of London. It is in the Home Circuit. The Assizes are held at Chelmsford. For parliamentary purposes the county is divided into North Essex and South Essex, each of which returns 2 members to parliament; besides which Colchester, Harwich, and Maldon return two members each; making altogether 4 for the county and 6 for the boroughs.

The following are the principal towns, with the population of each in 1841:—

Barking, a market-town, is situated on the eastern bank of the Roding, about two miles from the Thames, and 7 miles E. from London. The town derived its importance formerly from Barking Abbey, a rich conventual establishment of nuns, who were governed by an abbess who was one of the four who were baronesses in right of their station. The abbey was surrendered to Henry VIII. in 1539, and the abbess, and nuns, of whom there were about thirty, received pensions. Hardly any portions of the conventual buildings remain, except the church, which belonged to the Abbey, and contains some curious monuments. The Roding is wide up to Barking, and is called Barking Creek, the tide flowing up it from the Thames. Above the town the river becomes much narrower, but has been made navigable for small craft as far as Ilford. Many of the inhabitants are fishermen, or are employed in conveying coals and other necessaries from London for the supply of Barking and other places in the neighbourhood. Population of the town, 3751.

Billericay, a small market-town, 23 miles E.N.E. from London, stands on an eminence which commands a beautiful prospect over the valley which extends southwards to the Thames. Population of the town, 1824.

Braintree, a market-town, 40 miles N.E. from London, is situated on rising ground, on the north bank of Pod's Brook, which falls into the river Blackwater. The main street extends towards the village of Bocking, which is on the opposite or north-eastern bank of the Blackwater, while Bocking Street extends towards Braintree, and the two places are thus continuous. Braintree is an ancient place, with several very narrow streets, and many houses of wood. The church is large, and chiefly built with flint-stones. Population of the parish of Braintree, 3670; of the parish of Bocking, 3437.

Brentwood is situated on the road from London to Chelmsford and Colchester, 17¾ miles E.N.E. from London, by the Eastern Counties Railway. The town consists chiefly of one main street along the high road, and from its situation on a great thoroughfare, has several inns and public houses. The assizes for the county were formerly held here, and there are remains of the town-hall and prison. The market has been discontinued for some years. There is a small ancient church, and there is an endowed school. Population of the chapelry, 2362.

Chelmsford, a market-town, is situated near an ancient ford over the Chelmer, near its confluence with the Cam, 29¼ miles N.E. from London, by the Eastern Counties Railway. The town has risen to importance from its situation on the great thoroughfare from London to Suffolk and Norfolk. It consists principally of three streets. The houses are generally well built. Chelmsford is the assize-town for the county, and has a handsome shire-hall fronted with Portland stone. The new gaol is about a mile from Chelmsford, at Springfield. The parish church, the body of which has been rebuilt, has a square tower, embattled, and surmounted by a lofty spire. There is also a modern chapel, and there are four or five places of worship for dissenters. The free grammar school was founded and endowed by Edward VI. The theatre is a neat building. Population, 3883.

Coggeshall is situated on the northern bank of the Blackwater, 44 miles N.E. from London, and 10 miles W. by S. from Colchester. It is sometimes called Great Coggeshall, to distinguish it from the adjacent hamlet of Little Coggeshall. The town is irregularly laid out, and the streets are narrow. Manufactures of silk have nearly superseded the former manufactures of woollen. Coggeshall was the site of an abbey, of which a small part still remains. The parish church is spacious and handsome, with a fine eastern window, and a large western tower. There is an endowed school. Population of the parish, 3408.

Colchester. [COLCHESTER.]

Dunmow, or *Great Dunmow*, is situated on an eminence on the south-western bank of the Chelmer, 41 miles N.N.E. from London. The town consists principally of two streets. The church is ancient and spacious, with an embattled tower at the west end, and a fine east window. Population of the parish, 2792. The village of *Little Dunmow*, about 2 miles E. from Great Dunmow, had formerly a priory, and some parts of the priory church are incorporated in the present parish church. The custom of the manor of Little Dunmow, to deliver a flitch of bacon to any married couple who take a prescribed form of oath that they have not repented for a twelvemonth and a day after their marriage, has been ascribed to early Norman or even Saxon times, but is of uncertain origin.

Epping, 17 miles N.N.E. from London, is called Epping Street, and is about half a mile long. Epping gives name to the large tract of waste land in the south-western part of the county called Epping Forest, which is in fact a portion of the ancient Essex Forest. On the first Friday in July a fair is held round the spot once occupied by an enormous oak, called the Fairlop Oak, whence the fair is called Fairlop Fair. Population of the parish, 1943.

Gray's Thurrock, on the bank of the Thames, 24 miles E. from London, is a small town consisting chiefly of one irregular street, on a creek of the Thames accessible to small vessels. It is a market-town. Population of the parish, 1464. Little Thurrock and West Thurrock are two villages near Gray's Thurrock.

Halstead is on the north-eastern bank of the

Colne, 46 miles N.E. from London. The town stands on the slope of a gravelly eminence, rising from the river, and consists of a main street along the Norwich road, and some other streets. The church is a large edifice, with a tower at the west end surmounted by a wooden spire. Population of the parish, 5710.

Harwich is a parliamentary borough, and returns two members to the House of Commons. [HARWICH.]

Maldon is a parliamentary borough, and returns two members to the House of Commons. [MALDON.]

Manningtree is on the south bank of the æstuary of the Stour, near the head, 60 miles E.N.E. from London, by the Eastern Counties Railway. It is a small market-town, irregularly laid out. Population of the parish, 1255.

Rochford is on the Broomhill, which is navigable to within about a mile from Rochford, 40 miles E. by N. from London. There are two bridges over the river, which close to the town is little more than a brook. Rochford is a small market-town. Population of the parish, 1722.

Romford is 12 miles E.N.E. from London, by the Eastern Counties Railway. The town consists almost entirely of one long and wide street, in the centre of which is the town-hall and market-house. The church, erected in the early part of the 15th century, is tolerably large, and has a square tower at the west end. Population of the parish, 5317.

Saffron-Walden, a market-town, is 42 miles N. by E. from London, near the eastern bank of the Cam. The town is irregularly laid out, and many of the houses are ancient. The church is large, and is a very elegant specimen of the later perpendicular style of architecture. The town-hall is a neat building in the market-place, and there is a union workhouse. Saffron Walden is a municipal borough, and is governed by 4 aldermen and 12 councillors. Population of the parish, 5111.

Stratford is a suburb of London, being joined to it by a continuous line of houses, which runs through the larger suburbs of Mile-End and Bow.

Waltham-Abbey is on the river Lea, which is here divided into several channels, some of which flow through the town. Waltham-Abbey, which derives its name from an abbey which stood here, was also called Holy Cross, from a cross with a figure of Christ on it, to which miraculous powers were ascribed. The abbey was rich. Harold was buried in it, and Henry III. frequently resided in it. The present church is the nave of the conventual church. The architecture is Norman. There are few other remains of the abbey. The town consists principally of one main street. Population of the township, 2041.

Witham is on Pod's Brook, just above its junction with the Blackwater, 38 miles N.E. by E. from London. The town is ancient, and consists of two portions, the larger of which forms one main street along the high road and a short street or two branching from it: the other portion, in which is the church, is situated half a mile to the north of the principal part, on Cheping Hill. The trade of the place arises from the wants of the neighbourhood, and its situation on a great public thoroughfare. The church is a tolerably large building, containing some ancient monuments. Population of the parish, 3158.

History and Antiquities.—In the earliest dawn of the authentic history of our island, Essex was inhabited by the Trinobantes, a powerful tribe whose dominions perhaps extended across the Stort and the Lea into Hertfordshire and Middlesex. Some of the severe encounters between the Romans on one side, and Caractacus and Boadicea on the other, occurred in this county. On its subjugation by the Romans, Essex formed part of Flavia Cæsariensis. Several Roman stations were in Essex. Of these the most important is Camulodunum, which is supposed to have been Colchester. Roman antiquities have been dug up in many parts of the county, but especially at Colchester, where urns, pavements, and medals have been found in great abundance, and almost every ancient building shows a greater or less proportion of Roman materials worked up in its walls. Round Colchester are the remains of intrenchments and other military works.

When the Saxons established themselves in Britain, Essex, with some parts of Hertfordshire and Middlesex, constituted a small kingdom, the possessors of which were, from their relative situation, called the East Saxons. From them the county has derived its present designation. In A.D. 823, Egbert of Wessex despatched his son Ethelwulf and the warlike statesman Ealstan or Alstan, bishop of Sherbourne, into Kent and Essex; and these kingdoms, which had sunk into mere dependencies of Mercia, were subdued, and probably united under the designation of the kingdom of Kent. When Alfred, after the recovery of his throne, assigned to the piratical Northmen, or Danes, a settlement in and about East Anglia (A.D. 878), Essex was included in the ceded territory. One or two of the naval conflicts between the ships of Alfred and those of the Danes who continued to infest the coast, were fought off the Essex shore. There were for nearly two centuries repeated contests in Essex, between the Danish colonists and Alfred and his successors.

The history of the county is not marked by any particular event until the civil war between king John and his barons, during which, Colchester Castle was besieged. Of the troubled period of the 13th, 14th, and 15th centuries Essex contains several memorials, in the encampments, castles, and other ruins which are found in it. Besides Danish and Saxon camps, there are remains of many Norman castles, such as those of Colchester, Hedingham, Waldon, Ongar, and Raleigh. Of the halls and manor-houses which succeeded the Norman castles, and gave indication of a quieter period, though showing by their massive strength that the nation had not quite settled into peaceful security, may be mentioned Heron Hall, Nether Hall, Tolleshunt Beckingham Hall, Layer Marney Hall, Belhus or Bellas House, Covet or Covell Hall, Eastbury, Danbury Place, New Hull, and Toppinghoe Hall.

At the Reformation Essex possessed several

religious houses, of which there are some remains. There were at the time of the suppression seven of the greater monasteries, at Barking, St. Osyth, Walden, Waltham, Coggeshall, Colchester, and Stratford Langthorne. Of the smaller priories, there are remains at Beleigh, Tiltey, Bycknacre, Latton, Lees, Thoby, Blakemore, and Hatfield Peverel. Many of the churches deserve notice. That of Greenstead, near Ongar, is a very curious edifice, and one of the most ancient in the kingdom: it is traced up to the 11th century. The nave is entirely composed of wood, the sides being formed of the trunks of large chestnut-trees (or oaks) split or sawn asunder, and set upright close to one another. They are let into a wooden sill at the bottom, and into a plate at top, and secured with wooden pins. There is a boarded tower at the west end, but this does not appear to be so ancient as the nave: also a wooden porch on the south side of the nave. Little Maplestead church (near Halsted) is a building of great interest, being the latest of the few round churches in the kingdom; it is of pure decorated character, and its details plain, but very good.

When the Spaniards were expected to attack England with their Invincible Armada (A.D. 1588), a camp was formed at Tilbury, where a body of more than 18,000 men, under the earl of Leicester, was posted. Tilbury Fort was then a block-house, which had been built by Henry VIII. to defend the passage of the river; it was at a subsequent period enlarged and made a regular fortification, as it is at present. In the civil war of Charles I., Essex was almost entirely in the interest of the parliamentarians, and many contests took place within the county.

ESSEX, WALTER DEVEREUX, first EARL OF, was the son of Sir Richard Devereux and Dorothy, daughter of George, earl of Huntingdon. He was born in Caermarthenshire, at the castle of his grandfather, Walter, Viscount Hereford, about the year 1540. He succeeded to the titles of Viscount Hereford and Lord Ferrers of Chartley in his nineteenth year, and was early married to Lettice, daughter of Sir Francis Knolles. In the rebellion of 1569 he served Queen Elizabeth so effectively that she conferred on him the order of the Garter, and created him earl of Essex (1572). He soon after went to Ireland, on a scheme for colonizing a part of Ulster; and he was afterwards appointed earl marshal, but he was ill supported by the ministers at home, and was on the whole unsuccessful. He died, after a short illness, in Dublin, Sept. 22, 1576, and his countess, with the earl of Leicester, were suspected of having caused his death, to which their speedy marriage lent some support; but there is no proof of the fact. Essex left two sons, Robert and Walter, and two daughters. Of the daughters, Penelope married, first, Robert, Lord Rich, and afterwards Charles Blount, earl of Devonshire; Dorothy married, first, Sir Thomas Perrot, and afterwards Henry Percy, earl of Northumberland. (*Biog. Britan.*; *Criminal Trials*, vol. i.)

ESSEX, ROBERT DEVEREUX, EARL OF, son of the preceding, was born at Netherwood, in November, 1567. Under the superintendence of Lord Burleigh, he was sent to Trinity College, Cambridge, in 1577, and remained there four years. Upon leaving the university he retired to his estate in South Wales, and did not appear at court till 1584. He was immediately taken notice of and patronised by Elizabeth; and upon the death of Leicester, in 1588, he became chief favourite. In 1589 Essex suddenly joined the expedition of Drake and Norris, who had undertaken to restore Antonio to the throne of Portugal, against the queen's wishes, who sent to command his return, but too late. He distinguished himself alike by his gallantry and humanity, and on his return was restored to his place in the queen's favour. In 1591 (a year after he had married the widow of Sir Philip Sidney, whom the queen angrily declared to be unworthy of him), Essex was despatched to assist Henry the Fourth of France in his resistance to the king of Spain, who sought to obtain possession of Brittany. The expedition was wholly unsuccessful, and his only brother, Walter Devereux, to whom he was greatly attached, was killed.

In 1594 Essex, who had once before come into collision with the Cecils respecting the appointment of the queen's secretary, became a second time at variance with them, in consequence of having asserted the discovery of a plot against the queen's life, which they considered unfounded, but which Essex ultimately established, and the criminal, one Lopez, and his confederates, were executed. This opposition was renewed in 1596, on the proposal of Essex for the invasion of Spain. Essex's counsels prevailed, and the expedition, under Lord Howard and Essex, sailed, took and plundered Cadiz, destroyed and captured a number of Spanish ships, and occasioned great loss to the Spanish government; but the expedition was generally deemed a failure. In about two months he returned home, where, though created master of the ordnance himself, he continued to meet with disappointments in his endeavours to obtain official situations for his friends. In July, 1597, Essex, as commander-in-chief, with Lord Thomas Howard and Sir Walter Raleigh, sailed against the Spanish fleet. They were driven back to Plymouth by a storm, which did them great damage; and when they again sailed, though they made prizes to the value of about 100,000*l.*, they found the Spanish ships in harbour, and could not destroy them. Elizabeth was dissatisfied with the repeated ill success, and Essex retired to Wanstead, angry, on account of Howard being made earl of Nottingham and advanced in rank above him. He was pacified by being appointed hereditary earl marshal, which restored him to his rank. In 1598 a quarrel occurred between the queen and Essex. The queen gave him a box on the ear, and bade him 'go and be hanged.' Essex was very violent, withdrew from the court, and some months passed before he would make any submission, or suffer a reconciliation to be effected. In 1599 he accepted the commission of lord-lieutenant of Ireland. His government in that country was inconsiderate and ill-advised; and his opposition to the queen's wishes in the nomination of Lord Southampton to the general-

ship of the horse, which he was peremptorily ordered to revoke, gave great offence. He at length returned to England, without leave, in September, when he was confined to his house, denied the privileges and authority of his offices; and it was not until August 26, 1600, that he was liberated, and then he was not restored to favour.

Irritated by these feelings, and trusting to his general popularity, Essex listened to the rash and desperate advice of Cuffe, his secretary, to remove Cecil, Cobham, and Raleigh by force from the queen's councils. This was attempted on Sunday, February 8, 1601. It was utterly unsuccessful, and after a short defence at Essex-House, in the Strand, he was compelled to surrender himself, and with Lord Southampton was committed to the Tower: the rest of the conspirators were lodged in various other prisons. He was tried for treason in Westminster Hall on February 19, condemned, and executed on the 25th of the same month. ('Criminal Trials,' vol. i.)

He left one son, Robert, and two daughters. Frances married first the earl of Hertford, and afterwards the duke of Somerset. Dorothy was the wife first of Sir Henry Shirley, and lastly of William Stafford, of Blatherwyck, in Northamptonshire.

ESSEX, ROBERT DEVEREUX, 3rd EARL OF, was born in Essex House in the Strand, in 1592. He was sent to Eton by his grandmother, and thence, in 1602, he was removed to Merton College, Oxford. He was restored to his hereditary honours in 1603, and three years afterwards was unhappily married to Lady Frances Howard, a child of no more than thirteen years old. Essex was sent to improve himself abroad, while the bride continued with her mother. It was four years before he returned to claim his wife; and in a few months his wife, who had become intimate with Carr, afterwards earl of Somerset, instituted proceedings against him for physical inability, and procured a divorce. Essex then retired into the country till 1620, when he accompanied Lord Oxford in the war against Holland. In 1625 he was sent to aid the United Provinces, and his military skill having now attracted attention, the king appointed him vice-admiral of a fleet which was employed in a fruitless expedition against Spain. Essex married a daughter of Sir John Paulet, but he was again unfortunate: he and his wife separated, but a child was born to him, which died at the age of five years. In 1639 Essex, though his inclination to seek popularity among the Presbyterians was evident and undisguised, was employed by the king as lieutenant-general of the troops that were sent against the Covenanters. In 1640 he was one of the twelve peers who signed a petition that a parliament should be called and an attempt made to settle the difficulties of the state without further bloodshed. He was also one of the commissioners sent to Ripon to treat with the Scots. When the commons demanded of the king that a guard should be raised in the city of London, it was Essex whom they desired to have placed at its head. Charles declined, and ultimately deprived him of all his offices. Essex now became the chief favourite and leader of the parliamentary or Presbyterian party. He became parliamentary general in 1642, and was in consequence proclaimed a traitor by the king. He opposed Charles in person at Edgehill (1642); he also took Reading (1643), entered Gloucester, from which he had driven the king away, surprised Cirencester, and, after after fighting courageously at the doubtful battle of Newbury, succeeded in covering London. He afterwards marched to Cornwall, where he was encompassed by a superior royalist force, and was obliged to escape by sea from Fowey. Having once more collected an army, he was placed at its head, but an illness compelled him to quit its command. The independents soon after succeeded in carrying the 'self-denying ordinance,' which forbade members of either house of parliament to hold any command in the army: thus Essex ceased to be parliamentary general. It was voted that for his services he should be raised to the rank of a duke, and be granted a pension of 10,000*l.* a year. He did not however live to enjoy these honours, being carried off by a sudden and violent illness in the fifty-fifth year of his age.

ESSEX, JAMES, was the son of a carpenter at Cambridge, where he was born in 1723. Educated in the school of King's College, the unrivalled Chapel became the object of his admiration, and finally impressed him with the powers and beauties of a style which was then neither valued nor understood. In 1757 he was employed by Bentham to make drawings for his work on Ely Cathedral, and from him he acquired much information relative to the history of gothic architecture and its leading styles; and of that cathedral itself he altered the choir in 1770. He was afterwards employed in repairing Lincoln Cathedral, in repairing and altering several colleges at Cambridge, and in other works in the gothic style. Besides being a member of the Society of Antiquaries, he contributed several papers to their Archæologia. He died at Cambridge of a paralytic stroke, September 14, 1784.

ESSINGTON, PORT, is the first and to this day the only existing European settlement on the northern coast of Australia. The coast having been surveyed a few years before, the new colony was founded in 1824, in Apsley Strait, which separates the islands of Melville and Bathurst, and was called Fort Dundas. In 1827 a small establishment was erected at Raffles, on the peninsula of Coburg, and called Fort Wellington. But both settlements were abandoned in 1828, because none of the Malay traders resorted to them. The climate was found to be rather unfavourable to Europeans, and the soil of an indifferent quality; besides which, Apsley Strait is difficult of access and encumbered with shoals. Major Campbell, who was the last commandant of Fort Dundas, had an opportunity of examining the country in the neighbourhood of these settlements, and he recommended the establishment of a colony at Port Essington, which was made in 1838.

Port Essington is a deep inlet, which lies between 11° 6′ and 11° 25′ S. lat., and between

132° 5′ and 132° 18′ E. long. The inlet is about 18 miles long, with an average breadth of 5 miles. It contains three noble harbours, and is an admirable port for shipping. The shores present a pleasing variety of little bays and sandy beaches, alternating with bold cliffs and steep clay banks. The soil is in general indifferent, but in many places it is good, principally on the low flats and hollows and near tracts which are swampy in wet weather. The best land is found on the east of Port Essington. The vegetation is luxuriant. Most of the trees introduced by the settlers thrive very well, but the vegetation suffers much during the dry season, and the land requires to be irrigated. There are buffaloes, wild cattle, ponies, and pigs, in the woods; together with abundance of birds, water-fowl, and fish, in and around the inlet.

The north-west monsoon brings the rainy season. It is preceded by squalls and variable winds. The rain during this monsoon falls in torrents, but seldom continues above two or three hours at a time. The termination of the north-west monsoon is indicated by squalls, and usually a tempest, in the early part of April. The wind settles in the north-east, the sky becomes clear, the rains cease, the atmosphere becomes drier, and the weather more temperate. The monsoons blow uniformly at forty miles from the coast. In the interval the winds often blow in the direction of the monsoons, but frequently they are changed into regular sea and land breezes.

There have lately been very adventurous journeys made from Sydney to Port Essington, by Dr. Leichardt and Sir Thomas Mitchell.

On the western shores of Port Essington the town of Victoria was founded in 1838. It is yet in its infancy; for as the climate is too hot for European labour, the services of Malays is required; and these can only be obtained by degrees, so that emigration thither goes on but slowly.

ESSLINGEN, a town in the Würtemberg circle of Neckar, is situated a few miles by railway E. of Stuttgart, in a fine and fertile country on the banks of the Neckar, surrounded by heights crowned with forests and vineyards, in 48° 44 N. lat., 9° 19′ E. long., and has 6000 inhabitants. It consists of an inner town, which has massive walls and towers round it, and five suburbs (one on an island in the river), which are also protected by stout walls. It has 5 churches, a town-hall, an hospital, a high school, a training school, and an orphan asylum. Esslingen has manufactures of woollens, cotton and woollen yarn, lackered iron and tin ware, paper, &c., and a good trade in wine and other agricultural produce.

ESSOIGNS, Latin *Essonium*, French *Essoigne*, or *Exoine* (apparently from the Latin *exonerare*, to exonerate, but see Du Cange, in voc. *Sunnis*), is the allegation of an excuse for non-appearance by a person summoned to answer an action at law or to perform service at a court-baron. There were various causes of excuse, such as illness, falling among thieves, floods, &c.

Essoign Day of the Term. The first return day in every term was, properly speaking, the first day of the term (until essoigns were no longer allowed to be cast in personal actions), and on that day the courts sat to take essoigns or excuses from such as did not appear to the summons or the writ; wherefore it was called the essoign day.

The essoign or general return day is now regulated by 1 William IV., chap. 3, which enacts 'That all writs usually returnable before any of his majesty's courts of King's Bench, Common Pleas, or Exchequer, respectively, on general return days, may be made returnable on the third day exclusive before the commencement of each term, or on any day, not being Sunday, between that day and the third day exclusive before the last day of the term; and the day for appearance shall, as heretofore, be the third day after such term.'

ESSONNES. [SEINE-ET-OISE.]

ESTABLISHED CHURCH. The history of the Protestant Episcopal Church in England, now called the United Church of England and Ireland, commences in the reign of Henry VIII., who abjured the ecclesiastical supremacy of the Pope and declared himself head of the Church. [SUPREMACY.]

Whoever shall come to the possession of the crown of England must join in communion with the church of England as by law established. (12 & 13 Wm. III. c. 2, s. 3.) The Regency act, 3 & 4 Vict. c. 52, which appoints Prince Albert Regent of the United Kingdom in case of her Majesty dying before her next lineal successor is eighteen years of age, provides that in case of his marrying a Roman Catholic the guardianship of the heir to the crown and regency should thenceforth cease.

At the coronation of the king or queen regnant of England, one of the archbishops or bishops is required by 1 Wm. III., c. 6, to administer the Coronation Oath. [CORONATION OATH.]

The religious tenets of the United Church of England and Ireland are contained in the Thirty-nine Articles; and the services of the church are set forth in the Book of Common Prayer.

The Thirty-nine Articles include some which relate to the government of the Established Church. Article 39 recognises the Queen's supremacy as head of the church. Article 37 asserts the power of the Church to decree rites and ceremonies.

The Constitutions and Canons Ecclesiastical were framed by the Convocation of the province of Canterbury in 1603, and assented to by King James (who confirmed them for the province of York also). [CONSTITUTIONS AND CANONS ECCLESIASTICAL.] These canons maintain the king's supremacy over the Church of England, and subject to the punishment of excommunication whoever shall affirm what is contained in canons 3, 4, 5, 6, & 7.

The course of legislation throughout the whole of Elizabeth's reign was designed to enforce religious uniformity, by punishing nonconformity with various pains and penalties. The same policy was pursued in the succeeding reign.

The disputes between King Charles I. and the parliament resulted in the overthrow of the Established Church. The Court of High Commission

was abolished by statute (16 Car. I. c. 11), A.D. 1641. In 1642 bishops were deprived of their seats in Parliament, and their lands were subsequently seized for the expenses of the cival war. Parliament passed numerous ordinances by which many hundreds of clergymen were turned out of their livings. The cathedral service was put down, and the clergy were left to read the Liturgy or not, as they pleased, and to take their own way in other things. Marriage was performed by justices of the peace. On the 6th of June, 1646, an act was passed which partially established the Presbyterian form of church government in England; but it never obtained more than a limited and imperfect establishment.

After the Restoration of Charles II. was effected in 1660, the convention parliament passed an act (12 Car. II. c. 17) 'for the confirming and restoring of ministers,' and the next parliament, which met in May, 1661, repealed the act which disabled persons in holy orders from exercising any temporal jurisdiction or authority, the effect of which was to restore the bishops to their seats in the Upper House.

The Book of Common Prayer, which had been revised by a commission appointed by Charles II. after his restoration, was unanimously adopted by both houses of convocation, and approved by the king. An act received the royal assent on the 19th of May (14 Car. II. c. 4), which was entitled 'an act for the uniformity of public prayers and administration of sacraments, and other rites and ceremonies, and for establishing the form of making, ordaining, and consecrating bishops, priests, and deacons, in the Church of England.'

During the reign of Charles II. many acts were passed for the punishment of persons who did not conform to the Established Church. Some of them were even more severe than those passed in the reigns of Elizabeth and James I.

In the time of Wm. III. an act was passed (1 Wm. III. c. 18) which mitigated the enactments against all sects except the Roman Catholics. We refer to the article NONCONFORMISTS, for a brief notice of the Toleration Act, and some other statutes of a like character. Between this act of Wm. III. and the reign of Geo. IV. little was done to relieve Nonconformists or Roman Catholics from any of the penalties against those who did not conform to the doctrines and discipline of the Protestant Established Church.

In 1828 an act was passed (9 Geo. IV. c. 17) 'for repealing so much of several acts as imposes the necessity of receiving the sacrament of the Lord's Supper, as a qualification for certain offices and employments.' This act, which repeals the Test Act, provides another security in lieu of the tests repealed.

In 1829, when the Roman Catholic Relief Act (10 Geo. IV. c. 7) was passed, a provision was made for the security of the Established Church; and the oath to be taken by Roman Catholic peers on taking their seat in the House of Lords, and Roman Catholic persons upon taking their seat as members of the House of Commons, contains the following pledge, which is sworn to 'on the true faith of a Christian:' 'I do hereby disclaim, disavow, and solemnly abjure any intention to subvert the present Church Establishment as settled by law within this realm.'

Other acts have also been passed which have further departed from the old principle of requiring uniformity of religious faith. The act 6 & 7 Wm. IV. c. 85, enables persons to be married according to the rites of their own sects; and the same act permits the marriage contract to be made by a merely civil ceremony, in which respect the law now resembles in effect that which was established during the Commonwealth. In the act 3 & 4 Vict. c. 72, which is an act relating to marriages, the recent acts on the same subject are alluded to as being framed with the view of enabling marriage to be 'solemnized according to the form, rite, or ceremony the parties see fit to adopt.' The act for the registration of births, marriages, and deaths renders baptism unnecessary for civil purposes, and establishes a lay department for the registration of births, marriages, and deaths. The act 3 & 4 Vict. c. 92, enabled courts of justice to admit non-parochial registers as evidence of births or baptisms, deaths or burials, and marriages. In England the chaplains of gaols must be clergymen of the Church of England, but in Ireland there may be appointed for each union workhouse three chaplains, one Roman Catholic, one of the Established Church, and one Protestant dissenter.

Rates are levied in England and Wales called Church Rates, which Nonconformists are required to pay as well as churchmen. In Ireland the churches are kept in repair out of the funds in the hands of the Ecclesiastical Commissioners, which are derived from extinguished sees and other sources.

The principle of the state maintaining an exclusive system of education, in accordance with the principles and doctrines of the Established Church, has been partially abandoned both in England and Ireland. The parliamentary grants for education are enjoyed by dissenters as well as churchmen. In Ireland the state supports schools which are established on the plan of not permitting the inculcation of the peculiar doctrines of any religious body as a part of the regular course of teaching, but religious instruction is given by the ministers of different religious bodies to the scholars of each denomination separately. In the government plan for founding provincial colleges in Ireland the same principle has been adopted. Parliament has annually voted funds for the maintenance of an institution (Maynooth) for the education of Roman Catholic priests; and in 1845 this annual vote was converted into a fixed annual payment.

The King and Queen of England must be members of the Established Church, and may not marry a Roman Catholic; but *the only* other offices from which Roman Catholics are now excluded are the offices of guardians and justices of the United Kingdom, or Regent of the same, the office of Lord High Chancellor of Great Britrin or Ireland, the Lord Lieutenant of Ireland, and the office of High Commissioner to the General assembly of the Church of Scotland. The repeal of the Corporation and Test Acts opened the Municipal Corporations to Roman Catholics

and Dissenters; and in 1845 Jews also were admitted. Jews and others who do not believe in Christianity are excluded from the House of Commons by the form of the oath which members are required to take.

The Established Church is in possession of revenues from land, a large part of which are enjoyed under the old law of Frankalmoigne. The clergy also receive certain customary payments for the performance of marriages, christenings, and interments. Its form of polity is also guaranteed by the state. Parliament may alter the distribution of the property of the Church, as it has recently done by uniting and suppressing bishoprics, creating new sees, abolishing sinecures, and disposing of some parts of the revenues of the church for other church purposes; but it has not yet sanctioned the diversion of the revenues of the Church to other purposes.

The clergy of the Established Church constitute a distinct order. [CLERGY.] No person can be ordained to holy orders who does not subscribe to the Liturgy and the Thirty-nine Articles, which latter comprehend his assent to the doctrine of the king's supremacy. No person can hold any benefice without taking the oath of canonical obedience to the bishop. The constitution of the Universities of Oxford, Cambridge, Durham, and Trinity College, Dublin, is such as to exclude persons who do not belong to the Established church from a full participation in the advantages of those endowed seats of learning.

The revenues of the Established Church in England and Wales, as returned to the Ecclesiastical Commissioners in 1831, were as follows:—

	Gross. £	Net. £
Archbishops and bishops	181,631	160,292
Cathedral and collegiate churches and ecclesiastical corporations aggregate	284,241	208,289
Prebends and other preferments in cathedral and collegiate churches	54,094	44,705
Renewals of leases (average of three years)	21,760	21,760
Benefices (10,718)	3,251,159	3,055,451
Total	£3,792,885	3,490,497

The following is an account of all payments from the public monies to the Established Church of England and Ireland, or to the commissioners of Queen Anne's Bounty, from 1801 to 1840, both inclusive:—

ENGLAND.	£
Commissioners for building new churches	1,500,000
Grants from 1809 to 1820 inclusive, to governors of Queen Anne's Bounty for poor clergy	1,000,000
Drawback on materials and in building new churches	153,000
IRELAND.	
Grants for building churches from 1801 to 1820	749,551
Grants for Protestant charter-schools from 1801 to 1829	741,048
Grant for the relief of tithe arrears	1,000,000
Total	£5,193,599

The fifth article of the act for the Union of Great Britain with Ireland (40 Geo. III. c. 67), passed July 2nd, 1800, enacts, 'That it be the fifth article of union, that the Churches of England and Ireland, as now by law established, be united into one Protestant Episcopal Church, to be called the United Church of England and Ireland; and that the doctrine, worship, discipline, and government of the said united church shall be and shall remain in full force for ever, as the same are now by law established for the Church of England; and that the continuance and preservation of the said united church, as the established church of England and Ireland, shall be deemed and taken to be an essential and fundamental part of the union.'

There is this amongst other peculiarities in the Established Church in Ireland, that it is the church of only about a tenth part of the population. When a special census of the population was taken in 1834, with the object of ascertaining the religious persuasion of the people, it was found that out of a total population of 7,954,760 there were:—

		Proportion per cent.
Roman Catholics	6,436,060	80.9
Established Church	853,160	10.7
Presbyterians	643,658	8.4
Other Dissenters	21,882	.2

In England and Wales, the majority of the population belong to the Established Church.

It is stated ('App. to First Report of the Commissioners of Public Instruction,' Ireland, 1834) that of the 1387 benefices in Ireland there were 41 which did not contain any Protestants; 20 where they were less than or not more than 5; in 23 the number was under 10; in 31 under 15; in 23 under 20; and in 27 benefices the number of Protestants was not above 25. There were 425 benefices in Ireland in which the number of Protestants was below 100. There were 157 benefices in which the incumbent was non-resident, and no service was performed. The number of parishes or ecclesiastical districts is 2408, and of this number 2351 possess a provision for the cure of souls; but the total number of benefices is only 1387, as before mentioned, of which 908 are single parishes, and 479 are unions of two or more parishes.

The annual revenue of the Established Church in Ireland, during the three years ending 1831, was returned to parliament as follows:—

Archbishops and bishops	£151,128
Deans and Chapters	1,048
Economy estates of cathedrals	11,056
Other subordinate corporations	10,526
Dignities (not episcopal) and prebends without cure of souls	34,482
Glebe-lands	92,000
Tithes	555,000
Ministers' money	10,300
	£865,595

The incomes of the parochial clergy in Ireland are subject to some deductions, as payments towards diocesan and parochial schools, repairs of certain parts of churches, and repairs of glebe-houses. Diocesan schools ought to be maintained by annual contributions from the bishop and the beneficed clergy; but the levy drawn from this source is little more than nominal. The parochial schools are supposed to be maintained by an annual stipend from the incumbent, which is estimated by custom at two pounds per annum: in many cases this has not been paid. (Phillimore's 'Burn,' vol. i. p. 415.) The First-Fruits have been abolished by recent acts. They were designed to be the amount of the first year's income of every benefice, which was to be employed in the building and repairing of churches and glebe-houses and the purchase of glebe-land; but the assessment was made on the value of benefices in the reigns of Henry VIII., Elizabeth, and James I., and yielded only a trifling sum.

In the British colonies the Episcopal church is not established on an exclusive footing: other churches are supported or aided out of the public funds either furnished by the colony or the mother country. Some of the bishoprics in the colonies have been created by act of parliament, and their incomes are derived from the public revenues; but other colonial bishops are consecrated by the heads of the church, and appointed by them to colonial dioceses simply with the sanction of the government for the time.

ESTAIRES. [NORD.]

ESTATE. An estate signifies that title or interest which a man has in lands, tenements, hereditaments, or other property. It is either Real Estate, which comprises lands, tenements, and hereditaments held or enjoyed for an estate of freehold; or Personal Estate, which comprises interests for terms of years in lands, tenements, and hereditaments and property of every other description. Personal Estate [CHATTELS] goes to the executors, and is liable for payment of debts before Real Estate.

This is the legal signification of Estate, which is not a piece of land or other property, but signifies the relationship of ownership between a man and property. The word was also used in former times to signify men's station (status) or condition in life. It was also used, and is still sometimes used, to signify a class or order in a state.

Real Estate may be considered under three heads:—1, the quantity of estate, that is, the amount of interest in the owner; 2, the time when that interest is to commence; and 3, the quality of estate, or the mode in which it is to be enjoyed.

1. All real estates not being of copyhold tenure [COPYHOLD], or what are called customary freeholds, are either of Freehold or less than Freehold. Freeholds are freeholds of inheritance or freeholds not of inheritance. Freeholds of inheritance are either inheritances absolute, called fee simple, or inheritances limited, called qualified or base fees, or fees conditional. A freehold of inheritance absolute or Fee Simple is the largest estate which a man can have: the owner may freely dispose of it to whom he pleases in his lifetime by deed or by will, and if he dies without making any disposition, it descends to his heir.

A qualified or Base Fee has some qualification or limit annexed, which may determine the estate, as in the instance of a grant to A and his heirs 'tenants of the manor of Dale.' Whenever A or his heirs cease to be tenants of that manor, their estate is determined, that is, is at an end.

A Conditional Fee was a fee restrained to some particular heirs exclusive of others, as to a man and the heirs male of his body, by which limitation his lineal heirs female and collaterals were excluded; and this is the origin of Estates Tail. [TAIL, ESTATE.]

A Freehold, not of inheritance, is an estate which the owner has for his own life only, or the life of some other person, or until the happening of some uncertain event. As to tenant by courtesy and tenant in dower, see COURTESY and DOWER.

Of estates less than freehold there are three kinds—estates for years, commonly called leaseholds, at will, and by sufferance. An estate at Will arises where a man lets lands to another expressly at the will of both parties, or without limiting any certain estate; either party may put an end to the tenancy when he pleases. An estate by Sufferance arises where a tenant, who had entered by lawful title, continues in possession after his interest has determined. As to estates for years, see LEASE.

All estates may be made subject to a condition, or the happening or not happening of some uncertain future event, whereby the estate may be either created or enlarged or defeated.

2. Estates are either in possession or in expectancy.

Estates in expectancy are divided into estates in remainder and reversion, and by executory devise or bequest; and again, remainders are divided into estates in remainder vested and contingent.

3. Estates may be enjoyed in four ways; in severalty or by a single person, in joint tenancy, in coparcenary, and in common.

Estates are also Legal or Equitable. It is a legal estate when the owner is in the actual seisin or possession, and also entitled to the beneficial interest himself, or in trust for some other person. An Equitable estate is when some other person, not the person who is the actual and legal owner, is entitled to the beneficial interest of the property of which that other is in possession. The power of the beneficial owner over his equitable estate is as complete as if he were possessed of the legal estate.

ESTE, HOUSE OF, one of the oldest historical families of modern Europe, and the oldest among those which have retained sovereign power to the present time, the house of Savoy perhaps excepted. Some chronologists have endeavoured to trace back the genealogy of the house of Este to the fifth century of our æra; but the more probable origin is to one of the Longobard feudatories, who held Tuscany under Charlemagne. The family has undoubtedly held a distinguished rank in Italy from that time; and in 1070, one of them, Welf IV., was made duke of Bavaria, and

from him the line of Brunswick and Hanover, known also by the name of Este-Guelphs, is descended. From the main line, who held the fief of Este, descended the marquises of Este, who became afterwards dukes of Ferrara, and ultimately of Modena and Reggio. All took a prominent part in the political affairs of Italy, but perhaps the one most generally known is Alfonso II., the patron at one time of Tasso, but whom he subsequently imprisoned in the madhouse of Santa Anna, on suspicion of an attachment to his sister Eleonora. In 1598, on the failure of the direct male line, Ferrara was taken possession of by Pope Clement VIII. The family continued in possession of Modena and Reggio till the subjugation of Italy by Bonaparte, when Ercole Rinaldo, the last duke, was driven away, and died in the Austrian states in 1803. His daughter, Maria Beatrice, the last offspring of the house of Este, had married the Archduke Ferdinand of Austria, who died in the year 1800, and their eldest son, Francis IV., was restored by the peace of Paris in 1814 to the dominions of his maternal ancestors, namely, the duchy of Modena, Reggio, and their dependencies, including the district of Garfagnana, on the borders of Lucca. By the death of his mother he also inherited the duchy of Massa and Carrara, of which his grandmother, of the house of Cibo Malaspina, was the heiress. He died in 1846, and was succeeded by his son, Francis V. During the late disturbances in Italy, in 1847, the duke of Modena was chased from his capital, and subsequently abdicated. By a decree of May 19, 1848, Massa, Carrara, and Garfagnana were united to the Grand Duchy of Tuscany. The eldest daughter of Francis IV. was married to the duke of Bordeaux, Nov. 16, 1846.

ESTELLA. [NAVARRA.]

ESTHER, BOOK OF, a canonical and historical book of the Old Testament, placed after that of Nehemiah, but coming chronologically between the 6th and 7th chapters of Ezra. By the Jews the book has been always considered as one of the most precious of their sacred scriptures, and as a perfectly authentic history of real events which took place about B.C. 519. They call it Megillah Esther, that is, The Volume of Esther, or simply The Volume, and hold it in the highest estimation; believing that whatever destruction may happen to the other scriptures, Esther and the Pentateuch will always be preserved by a particular Providence. Le Clerc and some other critics have contended that the book of Esther is only an historical romance; but the great fact that the Jews still celebrate, and have immemorially celebrated, a festival designed to perpetuate the memory of the events which the book records, and for the origin of which no other account exists, has been urged by Eichhorn and others as affording sufficient proof of its authenticity.

ESTHONIA (*Wirova, Mete Maa*), one of the Baltic provinces of Russia, is bounded N. by the gulf of Finland; E. by the government of St. Petersburg; S. by the lake Peipus and Livonia, and W. by the Baltic. It lies between 58° 22′ and 59° 46 N. lat., and between 23° 20′ and 28° 13′ E. long. Its greatest length from E. to W. is 170 miles, and its mean breadth from N. to S. is 47 miles. The area, including the northern part of the lake Peipus, which belongs to Esthonia, is 7897 square miles; and the population in 1846 was 310,400. The extent of coast, reckoning all its windings, is little, if anything, short of 300 miles. A great number of islands lie along the coast, the principal of which are Oesel, Dagö, (10,000 inhabitants), Mœn, Worms, Noukö, Odenholm, the two Roogs, Nargen, Wrangelsholm, and Ekholm. Including the islands, the area of the province is close upon 10,000 square miles. The general character of the surface is level, occasionally varied by isolated hills. The northern coast, from Revel to Narva, is several fathoms higher than the Baltic, and strewn with masses of granite. The western coast is lower, but both coasts are edged for some miles inland by a deep bed of sand. The soil of the interior districts of Esthonia, which are the most fertile, is a mixture of loam, sand, and clay; in all parts are many lakes and large swamps, many of which are impassable, except when hardened by the frosts of winter. The proportion of cultivated to uncultivated and wooded soil is estimated at one-third.

The principal river, the Narova, flows out of the northern end of lake Peipus, divides the province from that of St. Petersburg, and falls into the Baltic below Narva.

Though the temperature is moderate when compared with that of the adjacent provinces, the winter is 6 months long, very cold and stormy; the summer is short and hot; autumn is dreary, rainy, and dirty; spring scarcely exists, and winds and fogs prevail throughout the year.

Agriculture is the principal branch of industry; the chief crops are rye, barley, and oats; wheat, Indian corn, hemp, flax, hops, and tobacco are also raised. The produce of corn exceeds the consumption; the surplus is chiefly used for distillation. As the harvest season is attended by heavy rains, the farmers have subterranean kilns in most parts, into which the moist grain is carried, for the purpose of being dried. Esthonia has large meadows, and produces abundance of hay; it has likewise good grazing grounds. The woods and forests, composed of the fir, pine, elm, birch, larch, and beech, occasionally intermixed with the oak, alder, linden, crab-apple, &c., are spread over an area of about 3300 square miles; they are densest in the eastern districts of Wesenberg and Weissenstein.

Next to agriculture, the rearing of cattle is the most important branch of rural industry. The native horses, oxen, and sheep are small ill-formed animals. Large droves of oxen from the Ukraine are fattened here for the St. Petersburg market. Goats, swine, and poultry are reared in great numbers. The wild animals are the bear, lynx, wolf, fox, badger, marten, and squirrel; a few elks are met with in the Wesenberg forests. The fisheries along the coast and in lake Peipus are very productive. On the islands ship and boat-building is a source of employment. The mineral products are building stone, potter's clay, and gypsum; there is abundance of peat.

The manufactures of Esthonia are extremely

limited; the peasantry are clothed with linen and coarse woollen cloth woven in their own houses, or else with sheep-skins. With the exception of distilleries, of which there are about 400 scattered through the province, the only establishments of any importance are in the chief town, REVAL, or REVEL.

ESTIENNE. [STEPHENS.]

ESTOPPEL, an impediment or bar to the exercise of a right, which impediment arises from a man's own act, or the act of some person through whom he claims. There are three kinds of estoppel. 1. *By matter of record*, as letters patent, pleading, &c. Thus, in an action against a patentee by his assignee, the patentee is estopped from pleading that the patent is invalid. 2. *By matter of writing*, as by deed, &c., parties and privies are estopped from alleging any thing contrary to the deed. 3. *By matter in pais* (in the country,) that is, transactions between the parties not evidenced by record or writing, as livery, entry, acceptance of rent, &c. Thus after acceptance of rent a landlord cannot treat his lessee as a trespasser. The rules which govern the application of this doctrine are laid down 1 *Inst.* 352 *b*.

ESTOVERS. Spelman, in his Law Glossary, says that this word is derived from the French *étoffe*, and that from *étoffer*, which is to supply with necessaries, and is of the same signification as the Saxon word *bote*. The word signifies the power which the owner of an estate for life as well as a tenant for years (in the absence of any stipulation to the contrary) possesses of taking a reasonable and necessary supply of wood from the estate for the use or furniture of his house or farm, and this, according to the use to which it was applied, was called house bote, plough bote, cart bote, or hedge bote. *House bote* is a sufficient allowance of wood to build or repair the house, or to burn in it, which latter is also sometimes called *fire bote; plough bote* or *cart bote* is the wood employed in the making or repairing all instruments of husbandry, as carts and ploughs, harrows, rakes, &c.; *hedge bote* or *hay bote*, for repairing hedges, fences, pales, stiles, and gates, and to secure inclosures.

If a tenant takes more than is needful for these purposes, he may be punished for waste, as if he cuts down wood to burn when he has sufficient dead wood upon the estate; and a tenant, although he may cut down and take sufficient wood to repair pales and fences as he found them, cannot do so to make new ones.

ESTRAY, any valuable tame animals found wandering at large within any manor or lordship, and whose owner is unknown. Having been impounded, and proclaimed in the church, and the two nearest market-towns on a market-day, they become, if not claimed in a year and a day, the absolute property of the king, as lord paramount of the soil, though generally the lord of the manor or liberty is the special grantee of the crown. The king or the lord does not acquire the property in the estray until the full expiration of the year and a day, which runs from the first proclamation, and not from the seizure; therefore if it escape before the time to another manor, he cannot reclaim it.

The king or the lord is bound to take care of the estray, and find it in provision. The owner, if he claims within the time allowed, must pay the charges of finding, keeping, and proclaiming it.

It is said that if any person not being entitled to estrays, finds and takes care of another's property, the owner may recover it or its value without being obliged to pay for the expenses incurred in keeping it. If this is the law, as declared by the judges, it ought to be altered.

ESTREAT, from the Latin word *extractum*, is a true copy or note on the rolls of a court of some original writing or record, especially of fines and amerciaments which are to be levied by a bailiff or other officer. In all cases of felony or misdemeanor where persons bound by recognizance either to appear themselves, or for the attendance of any witness on trials of felonies or misdemeanors, neglect to do so, the recognizance becomes forfeited; an officer of the court, whose duty it is, at the end of the assize or session prepares a list of the defaulters, and, when the same has been approved by the judge presiding, the fine or forfeiture mentioned in the recognizance is said to be estreated or certified into the Exchequer, and process is awarded for its recovery.

These fines, when levied, are paid into the Treasury; or the lords of the Treasury may, if they think fit, previously to the issuing of the process, stay the execution and remit the fine.

The various acts of parliament which now regulate the mode in which fines are to be levied upon estreated recognizances, &c., are 4th Geo. IV. cap. 37, with regard to those before justices of the peace; the 7th Geo. IV. cap. 64, before judges of assize, recorders, &c., and the 3rd and 4th Wm. IV. cap. 99, which relates to such only as are forfeited in the Houses of Lords and Commons.

ESTRELLA. [PORTUGAL.]

ESTREMADU'RA, a province of Spain, bounded N. by the province of Salamanca, E. by New Castile, S. by Andalusia, and W. by Portugal. Its length from N. to S. is about 180 miles, and its average breadth is about 90 miles from E. to W. Its area is reckoned at about 14,330 square miles; and the population, in 1833, was 547,420. Two large rivers, the Tagus and the Guadiana, both coming from Castile, cross the province from east to west, and their respective basins form the two natural divisions of the province, that of the Tagus being called Alta or Upper Estremadura, and that of the Guadiana Baja or Lower Estremadura. A range of mountains, which is a continuation of the Montañas de Toledo, in New Castile, and which, under the various names of Sierra de Guadelupe (5000 feet), Sierra Marchal, and Sierra de San Pedro, crosses Estremadura in a south-west and west direction, and then joins itself to the Sierra del Portalegre, on the frontiers of Portugal, forms the watershed between the Guadiana and the Tagus. To the north the basin of the Tagus is bounded by another and still loftier ridge, the Sierra de Gredos, a continuation of the mountains of Avila, in Old Castile, which runs westward under the names of Sierra de Francia and Sierra da Gata, along the boundaries between Estrema-

dura and Salamanca, and afterwards, entering Portugal, joins the Sierra d'Estrella. From this northern ridge several considerable streams, such as the Alagon and the Tietar, flow southward into the Tagus. Of the streams which enter the Tagus on the southern bank, the principal one is the Salor, which rises in the Sierra de San Pedro, and enters the Tagus below Alacantara.

The southern division of Estremadura is bounded to the south by a continuation of the Sierra Morena, which, under the name of Sierra de Guadalcanal and Sierra de Monasterio, divides the waters of the Guadiana from those of the Guadalquivir, running westward along the borders of the provinces of Estremadura and Seville, and then entering that part of Alentejo which is east of the Guadiana. This branch of the Sierra Morena is comparatively low, few if any summits reaching 2000 feet above the sea. The banks of the Guadiana, especially below Badajoz, are low, flat, and unhealthy. The finest districts of this part of Estremadura are those of Llerena (near the foot of the Sierra Morena), Xeres, and la Serena.

Estremadura is one of the least populous provinces of Spain; its depopulation dates from the expulsion of the Moors, and the subsequent establishment of the MESTA. About four millions of sheep come to graze, during winter, from the other provinces on the open pastures of Estremadura. Other tracts are covered with underwood and wild odoriferous herbs. There are also forests of oak, beech, chestnut, and pine trees, where numerous herds of swine feed. Bacon and pork form the most important articles of commerce with the other provinces of Spain. Game of every sort is plentiful. The cultivated parts produce wheat, oats, Indian corn, flax, hemp, and the vine, olive, mulberry, and lemon trees. Excellent honey and wax are also gathered. There are mines of copper, lead, iron, and silver. The manufactures are few, consisting chiefly of leather and hats at Badajoz, Zafra, and Caceres. The high post-road from Madrid to Lisbon crosses Estremadura, and is kept in good repair. The other roads are bad, and impassable for carriages in the rainy season.

The principal towns of Alta Estremadura, which is now more usually called Caceres, from its capital, are—*Plasencia*, a bishop's see, with 6700 inhabitants, and a fine aqueduct; it lies in the midst of one of the finest and best cultivated territories in all Estremadura; the convent of S. Justo, in which Charles V. ended his days, lies at the foot of the Sierra de Gredos, to the east of Plasencia: *Caceres*, south of the Tagus, with 10,000 inhabitants, the residence of the Audiencia, or supreme court of the province: ALCANTARA: *Valencia de Alcantara*, near the frontiers of Portugal and at the foot of the Sierra Fria, with 4700 inhabitants: *Truxillo*, E. of Caceres, which was the birth-place of the Pizarros, and has 4600 inhabitants: *Coria*, north of the Tagus, and west of Plasencia, with 2500 inhabitants.

The chief towns in Baja Estremadura, which is also called Badajoz, from its capital, are —BADAJOZ, the capital of all Estremadura: *Merida*, the ancient *Emerita Augusta*, with about 5000 inhabitants, a handsome Roman bridge on the Gundiana, restored by Philip II., a triumphal arch, the remains of a theatre, of a naumachia, and circus, and numerous other traces of its former splendour: *Xeres de los Caballeros*, south of Badajoz, with 9300 inhabitants: *Albuquerque*, north of Badajoz, and near the frontiers of Portugal, with 6700 inhabitants: *Olivenza*, a fortified place formerly belonging to Portugal, with 2000 inhabitants: *Llerena*, near the foot of the Sierra Morena, with 6500 inhabitants: *Zafra*, an industrious place, with tanneries, and manufactures of hats, &c., 7500 inhabitants: and *Medellin*, on the south bank of the Guadiana, the birth-place of Cortes, with 1700 inhabitants.

ESTREMADURA, a province of Portugal, is bounded N. by Beira, E. by Beira and partly by Alentejo, S. by Alentejo, and W. by the Atlantic Ocean. The greatest length of the province from N. to S. is about 140 miles, and its greatest breadth from E. to W. is about 85 miles. The area is stated to be 9850 square miles, and the population in 1841 was 782,875. The Serra de Estrella, which crosses the province of Beira, sends off a branch to the south-west, which enters Estremadura east of Pombal, and runs S.W. through the province under the names of Serra de Louzaõ, Serra de Alberdos, Monte Junto, and Serra do Baragueda. The Serra do Baragueda stretches to near Torres Vedras, and there meets the ridge which spreads from the Tagus to the sea across the peninsula in which Lisbon is situated. This latter ridge, which is separated from the former by a deep narrow ravine extending from Torres Vedras towards Sobral, furnished Lord Wellington in 1810 with a position of defence against the French under Marshal Massena. Serra de Estrella divides the waters which flow into the Tagus from those that run direct into the ocean.

Among the tributaries to the Tagus, the most considerable are—1, The Zezere, which has its source in the mountains of Beira, enters Estremadura near Pedrogaõ, and, running southwards, receives the Narvaõ below Thomar, and then enters the Tagus at Punhete, W. of Abrantes. 2, The Azembuja, called also Rio Mayor, which rises N. of the town of Rio Mayor, and, after passing the hill of Santarem, turns S.S.W., running parallel to the Tagus, which it enters near 39 N. lat. The streams which flow from the N.W. slope of the ridge into the ocean are—1, The Lis, which rises near Alcanhede, receives the Lena near Leiria, and enters the sea south of Cape Paredes. 2. The Alcoa, which rises S. of the Lis, is joined by the Baça (the two together giving the name to the town of Alcobaça), and after a short course enters the sea. 3. The Arnoya, a small stream which rises in the group of Monte Junto, and enters the sea by the lagoon of Obidos. 4. Farther S. towards Torres Vedras is the river Marceira, which passes by Vimieiro, and enters the sea S. of Peniche Point. 5. The stream Zizandre rises below Sobral, flows through the ravine above mentioned, and enters the sea a few miles W. of Torres Vedras.

That part of Estremadura which lies N.W. of the central ridge and between it and the sea

is mostly flat and sandy towards the coast, and either barren or covered with forests of pines. The country which lies to the S.E. of the ridge sloping towards the Tagus is finer and better cultivated, especially the plains about Thomar and Santarem, which are very fertile, and abound with olive and other fruit-trees and fine pasture grounds. The country about Cartaxo produces much wine. But the finest part of the whole province is that which lies to the S. of Torres Vedras towards Lisbon. Between various ranges of hills are delightful valleys, covered with villages, convents, and country-seats, and with gardens, orchards, and vineyards, remarkably well cultivated.

The southernmost part of Estremadura, which lies on the left bank of the Tagus, is not so fine as that on the right bank, being mostly low and flat, and in some places unhealthy. A range of hills, which is a continuation of the Serra de Portalegre in Alentejo, enters the E. of the province and terminates in the peninsula of Almada, opposite to Lisbon. The southern part of the province, which is nearly inclosed by Alentejo, the sea, and the Tagus, forms the comarca of Setubal. The other district, on the left bank of the Tagus and inclosed between it and Alentejo, contains the territories of Chamusca, Almeirim, and Salvaterra, which are included in the comarcas of Santarem and Alemquer.

The climate, with the exception mentioned, is generally healthy, being free from the excessive heats of Alentejo and from the cold winters of Beira. The westerly winds, which find an opening along the wide valley of the Tagus, refresh the air. The rivers, as well as the sea-coast, abound with fish. The principal products of the country are wine, oil, maize, fruits of every sort, and cattle. Wheat and oats are also raised, but in no great quantity.

Estremadura is divided into 11 comarcas:—1, Lisboa, in which are the towns—Lisboa the capital of Portugal [LISBON]: *Belem*, 4 miles W. of Lisbon on the right bank of the Tagus, in which are—a splendid monastery; a strong castle, at which vessels passing up the river pay duty; iron-foundries; and 5000 inhabitants: *Bellas*, with 3500 inhabitants: *Oeiras*, at the mouth of the Tagus and on the river Oeiras, population 3360: 2, Torres Vedras, in which are the towns—*Torres Vedras*, 25 miles N.N.W. of Lisbon on the Zizandre, which has 3600 inhabitants: and also *Mafra*, with 3000, and its splendid palace, church, and convent, called the Escurial of Portugal, and a vast royal park; and the port of Cascaes, near the entrance of the Tagus. 3, Villa Franca, in which are—*Villa Franca*, a pretty place on the right bank of the Tagus above Lisbon, population, 4000: and *Alhandra*, with 2000, and lime and brick kilns. 4. Alemquer, with the town of that name, 2600 inhabitants, and a paper manufactory; and *Chamusca*, on the left bank of the Tagus, with 3000. 5. Santarem, named from the town of *Santarem*, which stands on a steep hill rising above the Tagus, and has several large convents and other extensive buildings, an old castle, and 7300 inhabitants. The other towns of this district are—*Torres Novas*, a lively place in a fine country, with about 4000 inhabitants; *Goleyaõ* on the Tagus, where one of the principal fairs of Portugal is held; *Salvaterra de Magos*, on the left bank of the river, with a royal villa and hunting park. 6. Thomar, which contains the towns—*Thomar*, N. by E. of Santarem, with 4000 inhabitants, a large manufactory for spinning cotton, manufactories of hats and worsted stuffs, and a large monastery; *Abrantes*, about 90 miles above Lisbon, on the slope of a hill above the Tagus, with 5000 inhabitants, and a bridge of boats over the Tagus. 7. Ourem, named from the town of *Ourem*, W. of Thomar, which has 3000 inhabitants. 8. Leiria, in which are the towns—*Leiria*, with 2000 inhabitants, a bishop's see, and a castle on a steep rock; and *Pombal*, which stands near the borders of Beira, on the right bank of the Soure, a feeder of the Mondego, has 3 churches, a hospital, a large hat factory, and 5000 inhabitants. 9. Alcobaça, which contains the small town of *Alcobaça*, south-west of Leiria, with about 1300 inhabitants and a magnificent convent; the harbour of *San Martinho*; and farther south is the fortress of *Peniche*, on a promontory facing the Berlengas Islands; population, 2500. 10. Setubal, which takes its name from the town of *Setubal* (*St. Ubes*). This town stands at the mouth of the navigable river Sadaõ, has a good harbour and 15,000 inhabitants, and exports large quantities of salt made from sea-water in the neighbourhood, and also wine and fruits, especially oranges. It is, next to Lisbon and Oporto, the most commercial place in the kingdom. The other towns of this district are—*Almada*, opposite to Lisbon, with 4000 inhabitants; *Aldea Gallego*, higher up the river, which is the common landing-place from Lisbon to the southern provinces: population, 4000; and *Cezimbra*, west of Setubal, near Cape Espichel, with a small harbour and 4000 inhabitants, chiefly fishermen.

ESTREMOZ, a strong fortress in Portugal W. of Elvas and N.E. of Evora, from each of which it is 23 miles distant, agreeably situated on the Tarra, in Alentejo. The town is famous for the manufacture of the porous earthenware vessels used in Spain and Portugal to keep water cool. Population, 5000.

ESTUARY. [ÆSTUARY.]

ESZEK, the capital of the kingdom of Slavonia, is a royal free town situated in a level and marshy district on the right bank of the Drave, a little to the west of its efflux into the Danube. It stands on the site of the Roman *Mursia*, in 45° 34′ N. lat., 18° 42′ E. long., and has about 12,000 inhabitants. It consists of four quarters; is strongly fortified, and well built. The fortress and suburbs contain 5 Roman Catholic churches, 4 chapels, and a Greek church. There are several handsome buildings, such as the town-hall, the house of assembly for the states of Verácz (the county in which Eszek is situated), the barracks, and arsenal. The town has a high-school, a gymnasium, a military academy, and 2 monasteries. A bridge, which is connected with a causeway two miles and a half long, 55 feet broad, and 9

high, leads across the Drave and the swamps on its northern bank into the Hungarian county of Baranya. With the exception of some silk-spinning, there is little mechanical industry in the town. There is a considerable trade in grain, cattle, and raw hides. A steam-boat plies regularly every week between Eszek and Pesth.

ETÆ'RIO is a kind of fruit consisting of achenia, or small closed-up seed-like vessels, placed upon a succulent receptacle. The strawberry and the raspberry are of this nature, and are very incorrectly called *berries*, in the botanical sense of the word berry. [BACCA.]

ETAMPES. [SEINE-ET-OISE.]

ETCHING. [ENGRAVING.]

ETHAL, a substance separated from spermaceti. It is a solid, fusible at nearly the same point as spermaceti, and on cooling crystallizes in plates. It is susceptible of union with various bases, with which it forms salts or soaps.

ETHELBALD, king of Wessex, was son of Ethelwulf, who resigned the throne in 855 or 856. [ETHELWULF.] On the death of Ethelwulf, in 857 or 858, Ethelbald married his young step-mother, Judith of France; but at the instance of Swithin, bishop of Winchester, he afterwards abandoned the connection. Judith became the wife of Baldwin, count of Flanders, and ancestress of Matilda, wife of William the Conqueror. Although Ethelbald had greatly distinguished himself in the wars with the Danes in his father's time, his own reign is not marked by any military events; but his government is favourably spoken of by the chroniclers. He died in 860, and was succeeded by his brother, Ethelbert.

ETHELBERT, was the fourth king of Kent in lineal descent from Hengist, and succeeded his father Ermeric in 560. He engaged in a contest for the title of bretwalda with Ceawlin, king of Wessex, who claimed that supreme dignity as the grandson of Cerdic, but was defeated at Wimbledon in 568. Ceawlin however was deposed by his subjects in 589, and Ethelbert then attained the dignity, which he retained till his death, though it would seem that his title never was acknowledged by the kings of Northumbria.

The most memorable event in the reign of Ethelbert was his conversion to Christianity, and the establishment of that religion in his dominions by the ministration of St. Augustine. [AUGUSTINE, ST.] Ethelbert professed himself a Christian, and was baptised on the feast of Pentecost, A.D. 597. After his conversion, Ethelbert exerted himself with zeal in the diffusion of his new faith. He founded the bishopric of Rochester about the year 604 in his own dominions, in addition to the archbishopric of Canterbury, and also of the bishopric of London, in the state of Essex, which was at this time in subordination to Kent. It was also through his daughter, Edilberga, who married Edwin, king of Northumbria, that Christianity was introduced into that state.

Ethelbert is the author of the earliest of our written laws, the collection of 'Dooms,' as Bede calls them, 'which he established, with the consent of his Witan, in the days of St. Augustine.' The collection consists altogether of eighty-nine enactments or clauses; at least as it has come down to modern times.

Ethelbert died in 616, and was succeeded by Eadwald in the throne of Kent, but the dignity of bretwalda went to Redwald, king of the East Angles.

ETHELBERT, king of Wessex, was the second surviving son of Ethelwulf, and succeeded his elder brother Ethelbald in 860. The chronicles celebrate the courage and military talents which Ethelbert displayed against the Northmen, who continued to make occasional descents on the coasts of Wessex, as well as on those of other parts of the island. Ethelbert died in 866, and was succeeded on the throne of Wessex by his younger brother, Ethelred.

ETHELRED I., king of Wessex and head of the Heptarchy, was the third surviving son of King Ethelwulf, and succeeded his elder brother, Ethelbert, in 866. The reign of Ethelred was eminently disastrous, both for Wessex and for the other states of England. The Danes under Inguar (or Ivar) and Ubbo (or Hubba), landed in East Anglia, marched into Yorkshire in 867, took York, made themselves masters of all the kingdom of Northumbria south of the Tyne, and placed Inguar over it as king. In the next year they attacked Mercia, and took Nottingham, but Beorhed, the Mercian king, obtained the assistance of Ethelred, and the Danes by treaty agreed to evacuate Nottingham and to retire to York. In the spring of 870 they resumed hostilities, carrying their arms across the Humber into Lincolnshire, which was included in the dominions of Mercia, and into East Anglia, burning and destroying wherever they came. At a village called Hoxton, in Norfolk, they seized Edmund, the East Anglian king, and put him to death; he sustained the torments they inflicted upon with such constancy that he was afterwards revered as a martyr. His death made the Danes masters of East Anglia, over which they placed Godrun, one of their chiefs, as king. They now resolved to invade Wessex, and they entered and took the town of Reading. Numerous encounters with varying success now took place, in which Alfred, the king's brother, bore a distinguished part; but the Danes continued to maintain or rather to strengthen themselves in the country. In one of these battles, fought at Merton in 871, Ethelred received a wound, of which he died soon afterwards, leaving the inheritance of the crown of Wessex to his brother Alfred.

ETHELRED II., surnamed *the Unready*, king of the Anglo-Saxons, was the youngest son of King Edgar, by his second wife, the infamous Elfrida. On the murder by Elfrida of his elder brother, Edward the Martyr, in 978, he was reluctantly acknowledged as king by the Witan, and crowned by Dunstan, at *Kingston-on-Thames*, on April 14, being at this time only ten years old. The reign of Ethelred the Unready is on the whole the most calamitous and disgraceful in English history. From 980 to 991 the Danes almost annually ravaged the coasts, and in 991, after defeating the English army at Maldon in Essex, a treaty was concluded, by which they

engaged to retire on a payment of 10,000 pounds of silver. This money was raised by an impost on all the landed property in the kingdom, which from this time became a regular tax, under the name of the *Danegeld*, and was perhaps the first direct tax imposed in England. In 994 a much more powerful armament than had yet appeared sailed up the Thames under the command of Sweyn, or Svein, king of Denmark, and Olave king of Norway; it consisted of ninety-four ships, and directed its first efforts against London, which however defended itself successfully against the assault. In the end the invaders were again bought off by the payment of a sum of money, their demand this time having risen to 16,000 pounds of silver. Olave now consented to embrace Christianity; and he faithfully kept his promise of never again molesting England. But the king of Denmark continued his attacks year after year; and at last, in 1001, Ethelred was obliged to pay the Danes 24,000 pounds of silver to rid himself of them.

Bribery or tribute was found ineffective, and Ethelred resorted to another and a worse mode of dealing with the evil. On November 13, 1002, the English inhabitants, in obedience, it is said, to secret instructions received in every city from the government the evening before, suddenly rose in all parts of the kingdom upon the Danes who were resident among them, and put them to death, men, women, and children. The next year Sweyn, whose sister had been among the butchered, again appeared on the south coast; and from this time it may be said that the kingdom had no rest. After continual devastations, and frequent exorbitant payments, Sweyn at length made himself master of Northumbria, advanced to Bath, where he caused himself to be proclaimed king of England, marched to London, which submitted to him; and in Jan. 1014, Ethelred fled to the court of Richard duke of Normandy, whose sister Emma he had married.

Sweyn however died February 3, 1014, and Ethelred was recalled to England by an unanimous impulse, to which Canute, the son of Sweyn, deemed it prudent to give way. He however returned, and was preparing to attack London, when Ethelred died April 23, 1016. He was succeeded by Edmund, surnamed Ironside, his eldest son by a lady named Elfleda. Edward, one of his two sons by Emma of Normandy, also afterwards ascended the throne. [EDMUND IRONSIDE; EDWARD THE CONFESSOR.]

ETHELWULF was the son of Egbert the Great, whom he succeeded on the throne of Wessex and the supremacy over the other states of the Heptarchy, in 836. His early education is recorded to have been conducted first by Helmstan, bishop of Winchester, and afterwards by Swithin, whom, on coming to the throne, he advanced to the same see; and he had also served with distinction in the field in the lifetime of his father. What has been preserved of the history of the first fourteen or fifteen years of the reign of Ethelwulf consists almost exclusively of the detail of a series of contests with the Danes, who now continued with incessant perseverance those descents upon the English coasts which they had commenced in the preceding reign. Many severe battles were fought, and the Danes, though sometimes successful, and always doing great damage, themselves sustained considerable losses. In 851, having ascended the Thames with a fleet of 350 vessels, landed an army and plundered Canterbury and London, they were defeated first at Okeley in Surrey, then at Wenbury in Devonshire, and finally in a naval engagement near Sandwich. The consequence was that the Danes did not again make any attempt on England during the reign of Ethelwulf.

In 855, having assigned to his second son, Ethelbert, the kingdom of Kent, he undertook a journey to Rome, accompanied by his youngest son Alfred. On his return through France, he fell in love with Judith, daughter of Charles the Bald, king of that country, and married her, although she had not yet reached her twelfth year. Meanwhile however his eldest son Ethelbald, taking advantage of his father's absence, had entered into a scheme for seizing the throne, and although the return of Ethelwulf is said to have prevented the full success of the design, it was substantially carried into effect. Ethelwulf spent the remainder of his days mostly in exercises of devotion, and died in 857 or 858.

ETHER. [ÆTHER.]

ETHEREGE, sometimes written *Etheridge*, SIR GEORGE, was born about 1636, and was a distinguished wit and dramatic writer of the reign of Charles II. In 1664 he produced the comedy called 'Love in a Tub.' 'She Would if she Could' followed in 1668, and 'The Man of Mode, or Sir Fopling Flutter,' in 1676. All were received with much favour by the public. Ease and brilliance of dialogue are their characteristic excellences; but their licentiousness has long excluded them from the stage. Sir George Etherege's verses are not numerous, and consist of occasional pieces, lampoons, songs, and short amatory poems, some of which are of a very licentious character. Etherege was in James II.'s household, and was employed by that king as minister to Ratisbon, where, by some accounts, he died from a fall down stairs after a convivial entertainment; but this appears to be uncertain. The time of his death seems to have been about the Revolution.

ETHE'RIA, Lamarck's name for a genus of Conchifers, placed by many authors among the *Chamidæ*, but separated by Deshayes from that family. [CHAMACEA.]

Animal closely approximating to that of *Unio*. Lobes of the mantle disunited throughout their length, and, consequently, without either tubes or syphons. Below the foot, the branchiæ of the right side unite themselves to those of the left side in the medial line, and leave below them a rather large canal, in which the vent terminates. The branchial leaflets are unequal, strongly striated and festooned on their free border. The mouth is rather large, and furnished on each side with a pair of palps like those of the *Uniones*. Finally (and, as Deshayes observes, it is a great singularity in an animal that lives attached to foreign substances), it is provided with a very large foot, which may be compared in regard of its form and position with that of *Unio*.

Shell adherent, thick, nacreous, very irregular, inequivalve, inequilateral; umbones short, thick, indistinct; hinge toothless, irregular, undulated, callous; ligament longitudinal, tortuous, external, penetrating pointedly into the interior of the shell; muscular impressions oval, irregular, one superior and posterior, the other inferior and anterior; pallial impression narrow and small.

M. Cailliaud was the first to make known the fact that this genus is an inhabitant of the fresh waters, and M. de Férussac ('Mémoires de la Société d'Histoire Naturelle,' vol. i.) published a paper on the subject from M. Cailliaud's materials, in which the former also made a revision of the species. M. Deshayes, in his treatise on the genus ('Encyclopédie Méthodique') states that individuals of the same species adhere by the one or the other valve indifferently, which, he remarks, is not the case with the oysters or the *Chamæ*. That *Etheria* may be attached indifferently by either valve there is no reason to doubt after the assertion of M. Deshayes; but Mr. Broderip ('Zool. Trans.,' vol. i.) observes, that the same species of *Chama* is sometimes attached by the right sometimes by the left valve. M. Rang, during a voyage to Senegal, made some interesting observations on *Etheriæ* which live 200 leagues from the mouth of the river in the Senegal, and, together with M. Cailliaud, who received the animal from the Nile, published a memoir ('Mémoires du Muséum d'Histoire Naturelle') full of interest, in which the animal was described for the first time. The rivers of Africa and Madagascar appear to have afforded the specimens (which are still rather scarce in cabinets) hitherto collected. M. de Férussac, in his Memoires, gives the following information from M. Cailliaud; 'We first meet with *Etheriæ*,' says that zealous traveller, 'after passing the first cataract; and they do not appear to exist below; they become very abundant in the province of Rebata, beyond the peninsula of Meröe. The inhabitants collect them on the banks of the river, to ornament their tombs with them, and they say that they come from the more elevated parts of the Nile, from Saïda, where they are eaten.' M. Cailliaud found them as far as Fazoql, the most distant country into which he penetrated from the Blue River. In Sennaar, the inhabitants informed M. Cailliaud that during the summer season, when the river was low, they took them with the animal; but notwithstanding all his endeavours, M. Cailliaud could not obtain any living specimens, the river being then always too high. They are said to be very common in the Jaboussi, a river which runs into the Blue River, and in all appearance the numerous confluent streams of this great arm of the Nile produce them also. The number found upon the tombs throughout Ethiopia is so great, that it is astonishing that Bruce and Burckhardt should not have mentioned them. ('Zool. Journ.,' vol. i.) Example.—*Etheria semilunata*. Rafinesque applies the term *Etheria* to a genus of macrourous crustaceans.

ETHERINE, a substance which one theory makes the basis of æther. It is supposed to consist of $C^4 H^4$. [ÆTHER · ETHYL.]

ETHICS is the science which relates 'to our mental affections, not simply as phenomena, but as they are virtuous or vicious, right or wrong.' (Dr. Thomas Brown's 'Lectures,' p. 486, Edinb., 1830.) The term is derived from the Greek ἠθική, *Ethike*, which, in signification, is equivalent with the Latin *mos*, *mores*, whence the adjective *moralis*, and the English word *morals*. Aristotle, in the second book of his 'Nicomachean Ethics,' says that moral science received the name of ethics from the word *ethos* (ἔθος), 'habit, use, or custom,' since it is from habitual experience and the routine of customary conduct that moral dispositions and principles are gradually formed and changed. Cicero, in his work on moral ends ('De Finibus,' l. 1 and 5) briefly defines ethics, or morality, as the 'ars vivendi,' or 'doctrina bene vivendi,' that is, the art of living wisely or well; to which definition there is no objection; though 'well' may be understood in different senses. [MORALS.]

ETHICUS, or ÆTHICUS, is conjectured to have lived about the fourth century of our era, and is the reputed author of a Cosmography or short description of the world, being an enumeration of the seas, islands, provinces, mountains, rivers, and towns, of the then known world, with a short account of the sources and courses of the principal rivers. The Cosmography in some publications is followed by another and fuller description of the various parts and provinces of the world. This second work is found almost literally in Orosius, and forms the second chapter of the first book of his history. These two Cosmographies, and a third styled 'Julii Honorii,' &c., are printed in the edition of Pomponius Mela by Gronovius, Leyden, 1685.

ETHIONIC ACID, a bisulphate of æther, produced by the action of vapour of sulphuric acid on alcohol.

ETHIOPIA was the name given by the ancient geographers to the countries south of Egypt. In a more general and vague sense they called Ethiopians all the inhabitants of the south part of Africa, from the Red Sea to the Atlantic. Eastern Ethiopia, properly called Ethiopia above Egypt ('Herod.,' vii. 69), and also Ethiopia Orientalis, was a distinct and better-defined country. It included those regions which we now call by the names of Nubia and Sennaar, and perhaps part of Abyssinia, but to the south its limits were not known. Meröe, which lay above the confluence of the Astaboras (Tacazze) and the Nile, was the ancient capital of this Ethiopia. Ethiopia was a country early reduced to a fixed social state. Its government was monarchical, but the monarch was subordinate to an all-powerful hierarchy, more absolute than that of Egypt. Much discussion has arisen in respect to the question, whether civilization ascended the Nile from Egypt to Ethiopia, or descended from Ethiopia to Egypt. It is now believed, whatever may be the case with regard to industrial arts, that the religion of Egypt was derived from Meröe, where were many temples, and whence religious colonies set out for regions lower down the Nile. The ruins of Meröe itself are now believed to be those discovered by Cailliaud at Assour, above the con-

fluence of the Tacazze and the Nile: there are here vast heaps of ruins, which shew evidence of extreme antiquity.

The connection between Egypt and Ethiopia was renewed at various periods. Herodotus says that he saw in the records of the priests of Memphis (ii. 100), 18 Ethiopian kings registered among the 330 successors of Menes, who preceded Sesostris. Sesostris is said to have conquered Ethiopia; but this was probably a partial incursion, for Herodotus (ii.) says that Ethiopia was never conquered by any foreign power. In the eighth century B C. the Ethiopian invasion of Egypt took place, and Sabakos, an Ethiopian king, reigned over both countries; and we read in Kings ii. 19 of Tirhakan, a king over the joint countries, who warred against Sennacherib.

Under the Ptolemies, Græco-Egyptian colonies found their way into the regions of the Upper Nile, and along the shores of the Red Sea: these colonies probably extended the Egyptian arts as improved by the Greeks into Ethiopia. All these vicissitudes may account for the various styles of building and sculpture found along the banks of the Upper Nile. In the time of the second Ptolemæus the Ethiopians had a king Ergamenes, who had a knowledge of Greek manners and philosophy. Although the Romans are known to have made several expeditions into Ethiopia, very little is known of the period or mode of the extinction of the Meröe dynasty. Of the manners of the Ethiopians we know little. Their sacred language appears to have been the same as that of the Egyptian priests. From some sculptures at Barkal, it would seem that human sacrifices were occasionally in practice. A peculiarity in the Ethiopian institutions is, that their women sometimes went to battle, and were not excluded from the throne.

(Cailliaud, *Voyage à Meröe;* Heeren, *Egypt; Egyptian Antiquities, in Lib. Ent. Know.*)

ETHIOPIAN LANGUAGES. Under the general designation of the Ethiopian languages, three different dialects are usually comprised, the ancient Ethiopian or Geez, the Tigré, and the Amharic. The ancient language properly called the Ethiopian is now extinct, or at least survives only as the language of books and of learned men (whence it is also called *lesana mas' haf*, or book-language); and its place is now supplied by the two other dialects, of which the Tigré approaches nearest to the Ethiopic, whilst the Amharic has more widely departed from it.

The Ethiopian belongs to the family of languages usually called the Semitic, and among them it shows the closest affinity to the Arabic. It is written from the left to the right, in a peculiar alphabet, which however appears to be of Semitic origin.

The literature extant in the Ethiopian language is almost exclusively biblical and ecclesiastical. The Ethiopians possess a complete translation of the Old and New Testament, made by an unknown author from the Alexandrine text of the Greek version, probably not anterior to the fourth century; besides an apocryphal writing, peculiar to themselves, called the book of Henoch or Enoch, which is supposed by De Sacy to have been written during the reign of Herod the Great, and to be the book quoted in the Epistle of St. Jude (v. 14). ('The Book of Enoch the Prophet,' &c., translated by Richard Lawrence, Oxford, 2nd edit., 1833.)

The Ethiopians have no grammars nor a dictionary, properly so called, of their ancient language, and only possess vocabularies, in which words are classed according to the subjects to which they refer. In Europe the Ethiopian language was almost unknown till Job Ludolf (or Leutholf), assisted by a native of the country, made himself master of it. His first attempt at an Ethiopic dictionary and grammar was published at London, in 1661, in 4to.; a much improved and enlarged edition of both works appeared at Frankfort in 1702.

ETHIOPS, a term now obsolete, but formerly used by the old chemists to denote various dark-coloured metallic preparations; as *Ethiops Martialis*, which is a black oxide of iron; *Ethiops Mineralis*, which is a black mixture of mercury and sulphur, &c.

ETHULE. [ETHYL.]

ETHU'SA, a genus of brachyurous crustaceans (tribe *Dorippians*), established by M. Roux at the expense of the genus *Dorippe* of Fabricius and other naturalists. M. Milne Edwards observes that this genus is easily distinguished from *Dorippe* by the conformation of the apertures leading to the respiratory cavity. (For the characters of *Dorippe*, see *Règne Anim.*, vol. iv., p. 68.) Example, *Ethusa mascarone*, Roux; *Cancer mascarone*, Herbst.

ETHYL, ETHULE, or ETHEREUM, a hypothetical substance, which has never been isolated, but whose existence is rendered probable by the constitution of the æthers. It should have been stated in the article ÆTHER, that the received theory concerning that body makes it an Oxide of Ethyl, Ethyl being composed of C^4 H^5; and that Alcohol is a hydrate of the Oxide of Ethyl.

ETIENNE. [STEPHENS.]

ETIENNE-DE-BAIGORRY. [BAIGORRY.]

ETIENNE, ST., a large manufacturing town in the department of Loire in France, stands in a narrow valley on the Furens, a small feeder of the Loire, in 45° 26′ N. lat., 4° 23′ E. long., 288 miles S.S.E. from Paris, and has 48,554 inhabitants. It is situated at the junction of the railroads that lead to Lyon and Roanne, from which it is distant respectively 35 and 51 miles. The older part of the town is ill built; the modern part is well built with spacious squares, lofty houses, wide and regular streets; and the whole, always enveloped in the opaque dense smoke of its numerous workshops and factories, is superlatively dirty. The finest street is that through which the road from Paris to Marseille runs; it divides the town into two nearly equal parts. In the middle of this street and of the town stands the town-house, which, with the exception of an ancient church that dates from the 11th century, is the most remarkable structure in St.-Etienne. The town is well lighted with gas.

St.-Etienne stands in the centre of one of the most important coal-fields in France, from which about 500,000 tons of coal are exported annually. It is especially famous for the manufacture of silk ribands and fire-arms. Its ribands, which are exported to all parts of the world, are unequalled for richness of colour and beauty of pattern, and of the quantity manufactured an idea may be formed from the statement that their value amounts annually to upwards of 40,000,000 francs. Government orders for fire-arms having considerably fallen off since 1834, the workmen have turned their attention to making fowling-pieces, of which 30,000 a year are disposed of, besides a great number of pistols, &c. The manufacture next in importance is that of hardware and cutlery. To these leading objects of industry are to be added manufactures of scythes, nails of all kinds, saw-blades, foils, anvils, vices, files, silk and cotton velvets, &c., &c. The town has also many dye-houses and tanyards; and in the suburb of Terre-Noire there are important iron-forges and furnaces.

St.-Etienne is the seat of tribunals of first instance and of commerce: it has a consultative chamber of manufactures, conseil des prud'-hommes, a college, a school for deaf-mutes, a mining school, a small theatre, a public library, and a museum which contains a collection of the minerals and fossils of the neighbourhood and also specimens of the staple manufactures of the town. The population of St.-Etienne has doubled within the last 50 years.

(*Dictionnaire de la France;* Balbi, *Géographie.*)

ETI'SUS, a genus of brachyurous crustaceans, regarded by M. Milne Edwards as forming a passage between the *Xanthi* and *Platycarcini*. He divides this genus into two sections. *α. Carapace scarcely knobbed above.* Example, *Etisus dentatus.* Locality, the Indian Archipelago. *β. Carapace covered with knobs, separated by deep furrows.* Example, *Etisus anaglyptus.* Locality, Australasia.

ETNA. [ÆTNA.]

ETON. [BUCKINGHAMSHIRE.]

ETON COLLEGE was founded and endowed by Henry VI., as the 'College of the Blessed Marie of Eton by Wyndesore.' The foundation-charter is dated at Windsor, 12th September, 1440. It was confirmed by act of Parliament at Westminster, May 4th, 1441. The Statutes of Eton College are printed in the Parliamentary Reports on the Education of the Lower Orders, 1818. The original foundation was a provost, ten priests, four clerks, six choristers, twenty-five poor grammar-scholars, and a master to teach them, and the like number of poor men. It now consists of a provost, seven fellows, two conducts, seven clerks, seventy King's scholars, ten lay clerks, ten choristers, and a number of inferior officers and servants. The foundation scholars are admissible from the age of eight to sixteen, and unless elected at the age of seventeen, and put on the roll for admission to King's College, Cambridge, another foundation of Henry VI., they are superannuated at eighteen. Those scholars who are elected may continue in college till nineteen; and even at eighteen they may leave the college and continue as oppidans. The annual election to King's College takes place in July or August, after an examination of the upper class by the provosts of Eton and King's College, Cambridge, the vice-provost of Eton, two fellows of King's College, called 'Posers,' and the head master of Eton. The successful candidates are not immediately transferred to Cambridge, but remain at school until a vacancy occurs on the foundation of King's College. On their removal to Cambridge, the Eton scholars are received on the foundation and maintained out of its endowments, and after three years they succeed to fellowships. The number who go to Cambridge averages four yearly. There are two scholarships at Merton College, Oxford, for foundation scholars who are not elected for King's College, Cambridge. In 1829 the Duke of Newcastle founded and endowed three scholarships of the value of 50*l.* each; and in 1842 Prince Albert instituted an annual prize of 50*l.* for promoting the study of modern languages. Besides the scholars on the foundation, Eton College is attended by upwards of six hundred scholars called Oppidans, many of whom are the sons of persons of rank and fortune, and board with the masters, from whom they receive instruction as stipendiary pupils. There are a head master and lower master, ten assistant-masters in the upper school and three in the lower school, and a mathematical master: the whole sixteen are in holy orders. There are also masters for the French, Italian, and German languages, and other branches of education.

The income of the College from its endowments at present amounts to about 7000*l.* a year, derived from reserved rents, corn-rents, sale of woods, and also from manors, by fines and heriots. The college has about forty livings in its gift.

The college buildings are a conspicuous and ornamental object, especially if viewed from the terrace of Windsor Castle. The chapel, which is built of stone, is externally a handsome structure, and the interior has been recently restored. Its length is 175 feet, including an ante-chapel, which is sixty-two feet long. In the centre of one of the quadrangles is a bronze statue of Henry VI., and in the chapel there is another statue of the same king by Bacon.

ETRU'RIA was the name given by the Romans to a region of Italy extending from the river Macra to the Tiber, and from the Apennines to the Tyrrhenian Sea, the inhabitants of which they called Tusci, and at a later time Etrusci. The natives of Etruria however called themselves Rasena. The Greeks called them Tyrrhéni. The Tusci or Etrusci were settled in Italy north and south of the Apennines, in the plains of the Po, and on the banks of the Arno, some time before the assumed foundation of Rome. They had conquered a great part of this vast tract of country from the Umbri, one of the oldest Italian people of which history has preserved the name. They settled colonies in the conquered territory of the Umbri in and near the Adriatic. Of the great plain of the Po the Etrusci occupied the central

part, from the left bank of the Ticinus and the right bank of the Trebia, which separated them from the Ligurians on that side, to the Athesis or Adige, which divided them from the Véneti, who remained in possession of the coast of the Adriatic as far as the mouths of the Po. (Livy, v. 33.) South of the Po the Ligurians retained possession of the highlands of the Apennines as far eastward as the sources of the Arno, which river formed at first the boundary between them and the Etruscans, who afterwards extended to the Macra, where they built Luna. The Etruscan towns in the plain of the Po are said to have been twelve, like those of Middle Etruria, south of the Apennines; but Mantua and Felsina (Bologna) were the only two remaining in the time of Pliny. The others had been destroyed by the Gauls long before.

Towards the south Etruria is known to have extended as far as the Tiber previous to the existence of Rome. But the Etruscans at one period went also south of that river. Their regular settlement in Campania, where they are said to have also built twelve towns, was however of a later date, probably in the second or third century of Rome, when the Etruscan power, south of the Apennines, was at its height, and after they had lost by the Gallic irruption all that they possessed in the plains of the Po. The extent of the Etruscan possessions in Campania and the number of towns which they built or colonised there is a matter of much doubt. (Niebuhr, vol. i., 'On the Opicans and Ausonians,' and, for a conflicting opinion, Micali, vol. i. ch. 7.)

The permanent power of the Etruscans lay in Etruria Proper, or Etruria Media as it has also been called, which corresponds in great measure to the present Tuscany, with the addition of that part of the papal state which lies on the right bank of the Tiber. They had twelve principal cities or states, all situated between the Arno and the Tiber. Each state formed an independent community, the twelve being bound together by a sort of loose confederacy. Of these twelve towns, eight are mentioned by Livy (xxviii. 45) on the occasion of his enumerating the allies who volunteered to assist in equipping Scipio's armament against Carthage: they are Cære, Tarquinii, Populonium, Volaterræ, Arretium, Perusia, Clusium, and Rusellæ. To these must be added Veii and Vulsinii, which had been previously conquered by the Romans. The two remaining may be selected from among Cortona, Cosa, Capena, and Fæsulæ. The following is a brief notice of these ancient Etruscan towns and of their antiquities.

1. Arretium (Arezzo) was destroyed by Sulla, and no traces of Etruscan construction now exist. The remains of the ampitheatre are of the Roman period. But there are numerous Etruscan inscriptions, vases, coins, and other remains in the Museum Bacci at Arezzo, and a quantity of the red pottery. 2. Perusia (Perugia) has no remains of Etruscan structures, except the sepulchral building called la Torre di San Manno, about a mile outside of the walls, with an arched vault of large polished stones, bearing an Etruscan inscription in three lines, and the gate, vulgarly called Arco di Augusto, which however is believed to be of Etruscan construction. A rich collection of Etruscan antiquities however is found in the Gabinetto Archeologico, with about 80 inscriptions, one of which consists of 45 lines, the fragments of an Etruscan quadriga, described by Inghirami (vol. vi. p. 360), and some handsome painted vases, bronzes, &c. (Vermiglioli, 'Saggio dei Bronzi Etruschi trovati nell' Agro Perugino,' 4to., 1813. 3. Cortona retains unchanged the original circuit of its Etruscan walls, though repaired in several places. The walls are built of enormous polygonal stones, well fitted together without cement. 4. Fæsulæ, now Fiesole, one of the oldest Etruscan cities, has nothing Etruscan remaining except its massive walls. 5. Clusium, now Chiusi, the country of Porsenna, built on a hill above the valley of the Chiana, was one of the most distinguished Etruscan cities. Of its old walls there remains nothing but a fragment built of large polygonal stones. There are very rich collections of antiquities, urns, vases of old Etruscan manufacture, single coloured, and later ones, or Campano-Etruscan as they have been styled, with figures of one or two colours different from the ground, gold ornaments, engraved stones, &c., in the houses of Paolozzi, Sozzi, and Casuccini. The last mentioned is the richest, and a description of it by Valeriani, with above 200 plates, has been published under the title of 'Museo Etrusco-Chiusino,' 2 vols. 4to., 1833. 6. Volaterræ, Volterra, on a hill about twenty miles north-west of Siena, was about four miles in circumference: many parts of its walls, as well as one of the gates, are of old Etruscan construction, being built of large rectangular stones generally six feet in length, though some are much larger, set in horizontal layers without cement. In the thermæ which were discovered by Guarnacci was found a mosaic, which is now in the city museum, together with numerous sepulchral monuments, statues, bassi rilievi, both in alabaster and sandstone, vases, pateræ, &c. On these monuments of the ancient Etruscans we may, in some measure, read the history of their civilisation and social economy, as we read those of Egypt on the monuments of that country, in default of written records. One of the most extensive and satisfactory works on Etruscan antiquities is by Inghirami, 'Monumenti Etruschi o di Etrusco Nome,' 5 vols. 4to. of text, with 6 vols. of plates, and 1 vol. index.

Among the other Etruscan towns which are now destroyed, and of which nothing but ruins remain, are Cosa, or Cossa, on a hill east of the lake of Orbetello; Populonium, north of Piombino; Rusellæ, near the Ombrone; Saturnia, or Auregnia, on the Albegna; and Tarquinii, on the Marta, near Corneto. Tarquinii has no remains above ground, but there are a great number of hypogei or subterranean chambers, cut in the rock, and ornamented with stuccoes and paintings. In these chambers and tombs many urns, vases, mosaics, arms, and some skeletons, have been found.

Farther inland, about ten miles north of Tarquinii, near the village of Canino, Lucien Bonaparte discovered a vast quantity of similar re-

mains of Etruscan art, of which he formed a valuable museum at Canino, and of which he published a description. ('Museum Etrusque de Lucien Bonaparte, Prince de Canino,' in parts, 1829.) Other proprietors in the same district have made further discoveries.

History and Social State.—Varro mentions the Etruscan annals existing in his time as having been written in the eighth age of Etruria, which is supposed to correspond to the fourth century of Rome. Two Latin writers, Valerius Flaccus and Cæcina, the latter a native of Volaterræ, wrote histories of Etruria, and the emperor Claudius wrote in Greek his History of Etruria, in twenty books; but all these are lost. The little we know therefore of the national history of Etruria previous to their wars with Rome, is gathered from fragments and incidental notices in Greek and Roman writers, and is uncertain and obscure.

Veii was the first Etruscan city that fell by the Roman arms; Falerii and Fescennia next; Sutrium submitted: Cære and Tarquinii became the allies of Rome; and the Ciminus ridge with its haunted forests formed the boundary between Rome and Etruria. The Roman arms halted nearly a century longer before they passed that boundary. The total defeat of the confederated Etruscan forces at the lake Vadimonis, in the year 444 of Rome, opened to the Romans the access into the Etruria Transcimina. Vulsinii and Vulcia fell before the slow but sure progress of their arms; the other cities, such as Arretium, Perusia, Volaterræ, Populonium, disguised their submission under the name of allies, but Etruscan independence was gone. This appears to have been a period of general corruption of manners, when all national spirit and independence became extinct, but wealth, luxury, and internal peace remained, and sensual pleasures were the chief occupation of the people. The wars and proscriptions of Sulla gave a final blow to the existence of the Etruscans as a nation; their towns were destroyed, and their lands were given to military colonists. The proscriptions of Octavianus after the battle of Perusia completed the desolation of Etruria.

With regard to the political and social institutions of the Etruscans, we refer to Micali's work (vol. ii. chapters 21 to 24), in which he gives a sketch of their government, their religion and morality, and their domestic manners. The patrician and hierarchal order appears to have maintained to the last its sway among the Etruscans, the arts of divination, of which it was in exclusive possession, being a powerful instrument in its hands, among a people so much fashioned to religious observances and rites, for repressing all attempts of the commonalty. The Etruscans are acknowledged to have been the civilisers of a great part of Italy, and Rome probably derived its earlier civilisation, or at least part of its religious system, from Etruria. The art of fortifying towns with walls and towers is attributed to them. They wrought the iron which they drew from the island of Elba, they cast bronze, and they made silver vases and gold ornaments: they engraved on stone, and sculptures of primitive art are found on their oldest monuments. They are supposed by many to have been the inventors of the arch at a very remote period; Tuscan masons employed it in constructing the Cloaca Maxima of Rome. They understood hydraulics, especially the art of filling up marshes by diverting into them the course of muddy streams, which is still practised with great success in Tuscany under the name of 'colmate.' The invention of the termini, or stones fixing the limits of property, is attributed to them. The rights of property, those of paternal authority, of testamentary disposition, of marriages, were all fixed by law and consecrated by religious rites. Their laws concerning debtors appear to have been more humane than those of Rome, if we are to trust to a passage of Heraclides in which he speaks of the Tyrrhenians.

The Etruscans were fond of good living and of sumptuous banquets. Virgil (xi. 735) accuses them of being given to all kinds of sensual pleasures. The women reclined at table on the same triclinia with the men, as appears by their monuments. Their funerals were pompous, and accompanied by athletic games. The mythology of the Etruscans was partly of native, partly of oriental invention. They believed in two principles, a good and an evil one, each having its respective agents or genii, and their paintings and sculptures are often representative of the perpetual struggle between the two. Twelve gods, six male and six female, at the head of which was Jupiter, formed the upper hierarchy; other inferior divinities presided over the various elements and phenomena of this earth, as well as over the occupations and domestic comforts of man. Cicero speaks very favourably of Etruscan theosophy, saying that they referred every thing to God, and that all their religious institutions were studiously calculated for the prosperity and security of the state. For further particulars on these subjects, see Micali, ch. 22 and 23, Bossi, 'Storia d'Italia,' lib. i., chap. 6, and Müller, 'Die Etrusker.' Dempster, 'De Etruria Regali,' with the continuation by Passeri, is also a work of much information, apart from the system and favourite hypothesis of the writers.

ETRUSCAN ARCHITECTURE. We have no remains of Etruscan buildings, but we can form some idea of their style from their hypogei, or sepulchral monuments, and also from some of their cinerary urns which represent a temple. (Micali, plate 72.) But the monuments which serve perhaps to throw most light on this subject are those discovered at Castel d'Asso, five miles south-west of Viterbo, where the rock forming one side of the valley facing the old castle is sculptured all along for more than a mile in the shape of so many fronts or façades of sepulchral monuments, the vaults themselves being excavated underneath. Similar sculptures on the rock are found at Norchia, about 15 miles south-west of Viterbo. (Inghirami's Plates.) These monuments, which represent a primitive style of Etruscan building, strike by their resemblance to the Egyptian style in its ruder and simpler form. Plate 62 of Micali represents a monument between Monte Romano and Corneto, with projecting architrave and lateral pillars. Vitruvius, although he lived in an age when Etruscan art had under-

gone considerable alteration, characterises their buildings as low, wide, with heavy top ornaments. What is now called the Tuscan or Tuscanic order appears to have been a sort of rude Doric, which they probably adopted from the Greeks. Vitruvius (iv. 7) gives a description of their temples with three cellæ, but they appear to have been neither large nor splendid: the ornaments, bronzes, and plastic figures appear to have been more elaborate than the structures themselves. If not the inventors of the arch, the Etruscans were certainly acquainted with it at a very early period. Another cloaca of similar construction has been discovered near Tarquinii. Their skill in fortifying towns with walls and towers and ditches is attested by the Roman writers, and by the inspection of the remains of their walls. The use of large polygonal stones in the construction of walls was common to other Italian people as well as the Etruscans and primitive Greeks; and the name of Pelasgic, which has been given to these walls, appears to be incorrect, as it does not distinguish any particular class of these walls or the walls of any particular locality from other walls of the same kind. If by this term Pelasgic it is meant to assert that all such walls are really of Pelasgic origin, this is more than can be proved or presumed. In most instances however the Etruscans appear to have used rectangular stones, ranged in horizontal layers, and uniformly without any cement. For more complete information of what is known of Etruscan architecture, we must refer to Micali, ch. xxv., Inghirami's *text* and *plates*, *series IV.*, and Orioli, *Dei Sepolcrali Edifizi dell' Etruria Media*, also quoted by Inghirami.

ETRUSCANS. [ETRURIA.]

ETSCH. [BOTZEN.]

ETSCHMIADZIN. [ERIVAN.]

ETYMOLOGY. [LANGUAGE.]

ETYMOLO'GICUM MAGNUM, a vocabulary of the Greek language, of which the author is unknown. It is valuable for containing a great many traditions with regard to the meanings of old or uncommon words, and it often enables the scholar to correct the errors of the lexicon of Hesychius. The edition of Sylburg (1594) is very useful, and has a good index: the edition of the 'Etymologicum Magnum,' by Schäfer, Lips., 1816, is a reprint of Sylburg's edition. The edition by Sturz, Lips., 1818, 4to., intitled 'Etymologicum Græcæ Linguæ Gudianum,' &c., is founded on the Codex Gudianus.

EU. [SEINE-INFE'RIEURE.]

EUBŒA, now sometimes called *Negropont*, is an Island of the Mediterranean, lying along the coasts of Attica and Bœotia, from which it is separated by the Euripus, a very narrow channel, over which a bridge has been thrown, connecting the island with the mainland. It is 90 miles in length in a north-west direction, and 30 miles in extreme breadth; but in one part, between Aliveri Bay and Port Petries, it is scarcely 4 miles across from shore to shore. The only towns are Egripos and Karystos; the former situated where the island approaches nearest to the mainland, and the latter at the southern extremity of the island, at the bottom of a bay bearing the same name.

The island generally is elevated, and contains among its mountains some of the highest in this part of Europe. Mount Delphi rises on the eastern shore to the height of 7266 feet above the sea, and its summit is scarcely ever free from snow; Elias of Karystos, at the southern extremity, is 4748 feet high; Mount Khandhili, 4200 feet, and Telethrius, 3100 feet, are both on the western shore north of Egripos. The general formation of these mountains is gray limestone, with much clay-slate. The level tracts on the island are not extensive. On the northern coast, opposite to Thessaly, is the fertile plain of Oreos, the ancient Hestiæótis. Between Cape Politika and Egripos, is the fertile plain of Egripos; and there are a few other small plains.

To the southward the plains are generally cultivated with corn and olives, but those to the northward, called the Plains of Oreos, are more particularly devoted to the vine, from which a light red wine is made, which is the common beverage of the Greeks, and forms a staple article of trade. Cotton is also planted to the northward.

The island is conjectured to contain between 60,000 and 70,000 inhabitants, nearly all Greeks. The villages are few, and, as is the case everywhere in the Archipelago, built at some distance from the beach, generally on an elevation difficult of access. This precaution has been taken on account of the numerous depredations of pirates.

The passage between Thessaly and Eubœa is called the Trikiri Channel, from the town of that name at the eastern entrance to the Gulf of Volo, and it is about 4 miles in average width. In the Gulf of Talanda, so called from the town of that name on the Bœotian shore, there is an amazing depth of water under Mount Telethrius, where, for about 12 or 15 miles, there is no bottom with 220 fathoms within half a mile of the shore; but from this point the water shoals gradually towards Egripos. Near the base of Telethrius there are hot springs, of the same kind as those at Thermópylæ, but more abundant. From Egripos southward to Karystos there are only two villages, Aliveri and Stura, in the bays called respectively from their names. The bed of this part of the channel is level, but compared with the northern part it is shallow; the general depth is from 35 to 40 fathoms.

The eastern side of Eubœa is an almost continuous line of high and rocky coast. Along the whole extent of this coast, which is upwards of 100 miles, there are only five or six villages near the shore.

The mountains are said to contain copper, and the marble quarries near Karystos have long been famous. (Strabo, p. 446.) The soil, favoured by the diversities of climate which such a variety of elevation affords, is capable of yielding the productions of tropical as well as of more northern regions, and of supporting a much larger population than now occupies the land. The island abounds in sheep of an excellent breed. In the mountains are abundance of wild boar and deer, and the plains are overrun with hares and rabbits. Among the trees are the olive, oak, fir, chestnut, walnut, mulberry, and oriental plane. In the

whole island there is not a stream deserving the name of a river into which the smallest boat could enter, and the inhabitants generally supply themselves with water from wells.

The town of *Egripos*, the ancient *Chalcis*, the chief town in the island, is in 38° 26 N. lat., and 23°-37′ E. long., at that part of the island where it is separated from the coast of Bœotia by a narrow channel of only forty yards. It is a walled town, and further defended, where the walls are not washed by the Euripus, by a deep and wide dry ditch. The walls are turreted, slight, and built without regularity, and the numerous winged lions of St. Mark leave no doubt of their Venetian origin. The town has several gates constructed with great intricacy; that leading over the Euripus is particularly tortuous, and well defended; the drawbridges have been replaced by frail fixed bridges of logs, to the great peril of passengers.

There are facilities for building vessels of large size, as the shore goes off suddenly into deep water; but the inhabitants have advanced no farther yet than the repairs, clumsily executed, of their small boats, which are built generally at some of the Greek islands. The forests on Mount Delphi of fir and oak, the latter of an inferior quality, would supply wood, which might with facility be brought to the town.

Immediately opposite Egripos the land rises suddenly to hills of considerable height, beyond which lie the plains of Thebes, which town is distant about 4 hours, or twelve miles.

The breadth of the Euripus is diminished by a rock in mid-channel, on which a fort is built, which divides it into two channels: that towards the mainland, though rather the broader, is only practicable for small boats, as there is not more than three feet water at any time. Between the rock and the walls of Egripos is a distance of 33 feet, and the least depth at the highest water is 7 feet. It is here that the extraordinary tides take place for which the Euripus was formerly so noted: at times the water runs as much as eight miles an hour, with a fall under the bridge of about 1½ feet: but what is most singular, is the fact that vessels lying 150 yards from the bridge are not in the least affected by this rapid. It remains but a short time in a quiescent state, changing its direction in a few minutes, and almost immediately resuming its velocity, which is generally from four to five miles an hour either way, its greatest rapidity being however always to the southward. The results of three months' observation, in which the above phænomena were noted, afforded no sufficient data for reducing them to any regularity.

The site of *Eretria* in Eubœa has not been exactly discovered, but it must have been near the west coast and *south* of Chalcis.

The country around Egripos is flat for many miles, and very prettily studded with kiosks and small villages. An aqueduct which commences at the foot of Mount Delphi, and winds its way to within half a mile of the town, forms a very picturesque object. Though it no longer conveys water, it is by no means in a ruinous condition. It appears to be of Venetian construction.

Egripos is capable of vast improvements, and of becoming of great commercial importance. Little expense would render the passage of the bridge practicable for vessels of 300 and 400 tons, should it be required, thereby avoiding the passage along the outer coast of the island, which is the worst in the Archipelago, as the Dardaneiles' current sets on its iron-bound coast, which offers no port whatever, and is a lee-shore in the strong and prevailing north-east winds.

From Egripos there is a carriage road to Karystos, at the southern extremity of the island.

About B.C. 506, Eubœa became a kind of dependency of Athens. But in B.C. 445 it revolted, and Pericles recovered possession of it: the towns of Eubœa were reduced to the condition of tributaries to Athens, and an Athenian colony was settled at Oreos in the territory of Hestiæotis, the fertile plain on the north coast of the island. This island was of great importance to the Athenians; it furnished them with corn, and supplied them with horses. During the Peloponnesian war, after the defeat of the Athenians in Sicily, another general revolt of Eubœa took place, and the island placed itself under the protection of Lacedæmon, but afterwards returned to the Athenian allegiance, when Athens had recovered its independence. Its subsequent history is of little importance; and it fell under Roman dominion with the rest of Greece.

In the dismemberment of the eastern empire by the Latins or Franks the Venetians obtained possession of Eubœa, which they called Negropont, a barbarous name, probably derived from the town of Egripos, a corruption of Euripus, built on the ruins of Chalcis, and from the word 'ponte,' meaning the bridge which united it to the main land. The Venetians lost the island in 1470, when the Turks took the capital, Negropont, and massacred all the inhabitants. The Venetian doge and general Morosini blockaded it in 1688, but after a murderous siege he was obliged to re-embark with great loss. The people of Eubœa took part in the revolt of the Greeks against the Turks, and the island now forms part of the new kingdom of Greece.

EUCALY'PTUS, a genus of New Holland plants, consisting of lofty trees, with a volatile aromatic oily secretion in their leaves and a large quantity of astringent resinous matter in their bark. They belong to the alternate-leaved division of *Myrtaceæ*, and are generally known among those plants by their corolla being absent, and the limb of their calyx consolidated into a hemispherical or conical cap, which is thrown off when the stamens expand.

This genus occurs in the Malayan Archipelago, but is chiefly Australian, and, together with the leafless Acacias, gives a most remarkable character to the scenery. The species exist in great profusion, and form the largest trees in the forests of Australia.

No trees in the world so constantly or rapidly arrive at gigantic dimensions: they often become hollow. A height of 150 feet, and a girth of from 25 to 50, are not uncommon dimensions of these trees. Their timber is represented as highly use-

ful for domestic and other purposes; being so soft at first as to render the felling, splitting, and sawing up of the tree when green a very easy process, and when thoroughly dry becoming as hard as oak. Gum-tree is the universal name among the colonists for the Eucalyptus, and has arisen from the large quantity of an astringent gum-like juice, resembling gum Kino in its qualities, which all the species yield. The gum yielded by *E. resinifera* is considered by druggists as not in the least inferior to the Kino which the *Pterocarpus*, or Red Sanders Wood of India, produces. At Moreton Bay and in Van Diemen's Land a kind of manna is yielded by certain species. Their bark is often extremely hard, whence some species, especially *E. resinifera*, are called Iron-Bark Trees by the colonists. The Blue Gum-Tree and some others have the singular property of throwing it off in white or gray longitudinal strips or ribands, which, hanging down from the branches, have a singular effect in the woods. The leaves, instead of presenting one of their surfaces to the sky and the other to the earth, as is the case with the trees of Europe, are often arranged with their faces vertical, so that each side is equally exposed to light.

EUCHARIST (*εὐχαριστία*, thanksgiving) is a Greek name of the Christian sacramental act otherwise called the Communion, or the Lord's Supper; and particularly expresses the idea of thankfully commemorating the mediatorial sacrifice of Christ.

Elaborate accounts of the history and doctrines of the Eucharist are given by bishop Patrick, Dr. Waterland, and numerous other writers, of whom a list is furnished in Watt's 'Bibliotheca Britannica.' [Communion.]

EUCHROITE (*Arseniate of Copper*) occurs crystallized. Primary form a right rhombic prism. Colour bright emerald green. Hardness 3.5 to 4.0. Transparent, translucent. Specific gravity 3.38 to 3.41. Found in Hungary. Analysis, by Turner:—Arsenic acid, 33.02; oxide of copper, 47.85; water, 18.80.

EUCHYSIDERITE (*Achmite*), a crystallized mineral. Form, an oblique rhombic prism; colour, brownish black, and nearly opaque. It consists of silica, soda, lime, and oxides of iron and manganese.

EUCLASE, a crystallized mineral. Primary form, an oblique rhombic prism. It is generally of a bluish colour, nearly transparent, and refracts doubly. It consists of glucina, silica, alumina, and oxides of iron and tin.

EUCLID. [Geometry.]

EUCLID (*Εὐκλείδης*) of Mégara is a different person from the geometrician of the same name. He was a scholar of Socrates, after whose death he founded at Megara the school called the Megaric, Dialectic, or Eristic School. He wrote six dialogues, which are lost.

EUDIOMETER, an instrument invented by Dr. Priestley, and originally employed by him in ascertaining the goodness of atmospheric air obtained from various places and under different circumstances. The use of the eudiometer, termed eudiometry, has, since its original contrivance, been extended to all gaseous mixtures, but especially to determining the quantity of oxygen which they contain when resulting from the operations of analysis.

The principle upon which the use of the eudiometer depends, so far as atmospheric air and oxygen gas are concerned, is that of exposing them to the action of some substance, whether solid, fluid, or gaseous, which, on account of its affinity for oxygen, combines with it and leaves the gas with which it is mixed unacted upon.

The eudiometer invented by Dr. Priestley was extremely simple. He filled a phial with water, and displaced the water with the gaseous mixture to be examined; the volume of this being noted, it was transferred into an air-jar. An equal volume of nitric oxide was added to it, and they remained together a few minutes. When this part of the process was over, the gas was transferred to a graduated glass tube. After noting the volume of the gas, the result was expressed in measures and decimal parts; thus, when equal volumes of common air and nitric oxide were mixed, and they afterwards occupied the space of one volume and two-tenths, Dr. Priestley, in speaking of the air so tried, said the measures of the test were 1.2, or the standard of the air was 1.2.

Numerous attempts have been made to render the eudiometrical application exact and certain by Cavendish, Fontana, Ingenhouz, Sardinani, Dalton, Gay Lussac, Henry, Thomson, Davy, and others. The eudiometer of Scheele was a graduated glass tube containing a certain volume of air, which was exposed to a mixture of sulphur and iron filings made into a paste with water. De Marté, instead of using sulphur and iron, employed a solution of sulphuret of potassium prepared by dissolving sulphur in a solution of potash. Guyton employed sulphuret of potassium also in his eudiometer, but he used it in a solid state, and applied heat to expedite its action. The eudiometer of Seguin is a glass tube, filled with and inverted in mercury; a small piece of phosphorus is put under the open end of the tube, and by its lightness it immediately rises to the top of it, where it is melted by the approach of red-hot iron. A measured portion of the gas to be examined is then passed into the tube; the phosphorus inflames on each addition of the gas, and the mercury rises, owing to the condensation of the oxygen. The quantity of the residual gas is determined by transferring it into a graduated tube, and the difference between the quantity submitted to experiment and that left after it indicates that of the oxygen absorbed. Berthollet also employed phosphorus in his eudiometer, but instead of heating it, as in the above-described method, he allowed combination to take place between it and the oxygen by slow combustion. Dr. Hope, Dr. Henry, and Mr. Pepys, employed a eudiometer, in which the test liquid was either a solution of iron impregnated with nitric oxide, or a solution of sulphuret of potassium. Volta's method of determining the quantity of oxygen contained in gaseous mixtures is by means of combustion with a known volume of hydrogen gas; for it having been ascertained that when a mixture of oxygen and hydrogen gas is fired, one-

third of the diminution is owing to the condensation of oxygen, we have only to observe the measure of the contraction of volume to ascertain that of the oxygen which was present. Various modes of effecting this have been devised by Volta, Mitscherlich, Dr. Ure, and others.

Dobereiner has suggested a eudiometrical process, founded on his curious discovery of the property which spongy platinum possesses of causing the combination of oxygen and hydrogen gases. In this eudiometer the combination occurs without explosion, and yields results of great accuracy. Dobereiner found that when the spongy platinum was mixed with certain substances, so as to prevent its immediate and explosive action, it caused the oxygen and hydrogen to combine with moderate rapidity. Dr. Henry and Dr. Turner employed modifications of this process.

EUDOCIA, daughter of Leontius, an Athenian sophist, was called *Athenais* before her baptism. She was carefully instructed by her father in literature and the sciences. After her father's death, being deprived by her brothers of all share in the inheritance, she repaired to Constantinople, and appealed to Pulcheria, sister of Theodosius II., who was so pleased with her that she induced her brother to marry her, A.D. 421. Eudocia surrounded herself with learned men; but the emperor, through jealousy, dismissed all her court, and had her exiled to Palestine, where she continued to reside after the death of her husband. She there embraced the opinions of Eutyches, and supported by her liberality and influence the monk Theodosius, who forced himself into the see of Jerusalem, after driving away Juvenal, the orthodox bishop, and kept it until he was himself driven away by order of the Emperor Marcianus. Euthymius, called the Saint, brought back Eudocia to the orthodox faith, after which she spent the remainder of her days at Jerusalem, where she died in 460, protesting her innocence of the guilt with which her husband had charged her. Eudocia wrote several works, of which Photius quotes a translation in verse of the first eight books of the Old Testament. (Gibbon, *Decline and Fall*, &c.; Tillemont, *Hist. des Empereurs*, vi.)

EUDOCIA the Younger, daughter of the preceding and of Theodosius II., married Valentinianus III. After the assassination of her husband by Petronius Maximus, she was obliged to marry the usurper. Eudocia, out of indignation and revenge, called in Genseric, king of the Vandals, who came to Italy, plundered Rome, and carried Eudocia to Africa with him. Some years afterwards she was sent back to Constantinople, A.D. 462, where she died.

EUDOCIA, the widow of Constantinus Ducas, married Romanus Diógenes, an officer of distinction, A.D. 1068, and associated him with her on the throne. Three years after, Michael, her son, by means of a revolt, was proclaimed emperor, and caused his mother to be shut up in a convent, where she lived the rest of her life. She left a treatise on the genealogies of the gods and heroes, which displays an extensive acquaintance with the subject. It is printed in Villoison's 'Anecdota Græca,' 2 vols. 4to., 1781.

EUDOXUS, a native of Cnidus, a city of Caria, in Asia Minor, and the son of Æschines, flourished about 370 B.C. He studied geometry under Archytas, and afterwards travelled into Egypt to study the sciences under the priests of that country. Proclus says that Euclid very liberally borrowed from the elements of geometry composed by Eudoxus. Cicero calls Eudoxus the greatest astronomer that had ever lived; and we learn from Petronius that he retired to the top of a very high mountain that he might observe the celestial phenomena with more convenience than he could on a plain or in a crowded city. Strabo (p. 119) says that the observatory of Eudoxus was at Cnidus, from which the astronomer saw the star Canopus. Vitruvius (ix. 9) describes a sun-dial constructed by him; and Strabo (p. 390) quotes him as a distinguished mathematician. Nothing of his works remains. He died in the fifty-third year of his age.

EUDOXUS, of Cyzicus, was sent by Ptolemæus VII., of Egypt, on a voyage to India about B.C. 125. (Strabo, p. 98, Casaub.) The passage of Strabo referred to contains an account of his adventures. From this Eudoxus, or another of the name, Strabo derived some materials for his geographical work (379, 550, &c.)

EUDYALITE, a mineral which occurs both crystallized and massive. The crystals are rhomboidal, reddish-brown, and nearly opaque. They are found in Greenland.

EUGENE-FRANÇOIS, DE SAVOIE, commonly called Prince Eugene, was a younger son of the Comte de Soissons, descended from the house of Savoy, and born at Paris, October 18, 1663. He was designed for the church, but chose the military profession, and considering his family wronged by Louis XIV., entered the service of the Emperor Leopold. His first campaign was against the Turks, at the celebrated siege of Vienna in 1683. In 1688-9, on the breaking out of war between France and the Empire, he was employed against France in Piedmont, where, though at first successful, the French ultimately forced the Duke of Savoy to a separate peace, and he was withdrawn in 1693. He was next employed against the Turks in Hungary, and won a great victory over the Turks at Zenta, on the river Theiss, September 11, 1697. The peace of Carlowitz (1699) closed this scene of action; but a more brilliant one was opened in 1701 by the war of the Spanish succession. During two years Eugene maintained the imperial cause in Italy with honour against superior forces commanded successively by Catinat, Villeroi, and Vendôme, against the last of whom he fought the indecisive battle of Luzara, August 1, 1702, in which the flower of his troops was destroyed. At the end of this campaign he returned to Vienna, and was appointed president of the council of war.

In 1704 he commanded the imperial troops at the battle of Blenheim, August 13, 1704. The successes of the French in Piedmont made it expedient for him to return thither in 1705. He soon restored the duke of Savoy's declining fortunes, and won the decisive battle of Turin,

September 7, 1706, after which the French evacuated the country. He was thus set again at liberty to co-operate with Marlborough in 1708, and had a share in the victory of Oudenarde, and in the capture of Lille, the siege of which was entrusted to him, while Marlborough protected his operations. In 1709 he was wounded at the bloody battle of Malplaquet, of which he was the chief adviser, and in which he led the attack upon the left wing. On the death of the Emperor Joseph in 1711, he took an important part in securing the succession to his brother Charles VI., and he visited England at the end of that year, in hope of preventing the secession of England from the alliance, but in vain; and after a short invasion of France in 1712, the peace of Rastadt was concluded March 6, 1714.

In 1716 Prince Eugene again marched against the Turks, and won the battle of Peterwardein, August 6, against an enormous disproportion of numbers. In the following year he besieged Belgrade with 40,000 men. With troops wasted by disease, pressed by an army of 150,000 men from without and opposed by a powerful garrison from within, he was in the utmost danger, when, with the happy boldness which distinguished him, he defeated the army, and the town surrendered. Peace was concluded in the following year.

He took up his residence at Vienna, but in 1733 a fresh quarrel with France called him again to command the imperial army on the banks of the Rhine; but little was done in this war, and preliminaries of peace were signed at Vienna, October 5, 1735. He died suddenly in that capital, April 21, 1736, aged 73.

The best account of his exploits is 'L'Histoire du Prince Eugène,' 5 vols. 12mo., by M. de Maubillon, but published without his name. In English, there is Campbell's 'Military History of Prince Eugene and the Duke of Marlborough,' 2 vols., fol.; and several smaller works.

EUGE'NIA, a genus of dicotyledonous polypetalous plants of the natural order of *Myrtaceæ*. The genus, as at present constituted, contains nearly 200 species, though numbers have been removed to other genera. This genus is confined to the hot and tropical parts of the world, and extends from the Moluccas and Ceylon to Silhet and the foot of the Himalayas.

The most remarkable species of this genus, and one of the few which it is necessary to notice, is the Allspice, Pimento, or Bay-Berry Tree. It is a native of South America and the West India Islands, especially Jamaica, and from being cultivated there is often called Jamaica Pepper. The tree is very handsome, often 30 feet high, and much resembles the Clove Tree in the form and appearance of its leaves as well as in habit.

The Pimento (*Eugenia pimenta*), is cultivated with great care in Jamaica, and abounds on the hills on the north side of the island. The trees are formed into regular walks, and begin to bear when three years old, but are not in perfection until they have been planted seven years. They thrive best in rocky lands, or a rich soil having a gravelly bottom. Mr. Bryan Edwards says that a single tree has been known to yield 150 lbs. of the raw fruit, or 100 lbs. of the dried spice; but the crop is uncertain, and plenteous perhaps only once in five years. The tree has been introduced into and flourishes in the southern parts of India. The berries, being the valuable part of the tree, require care in gathering as well as drying.

Eugenia Michelii is a Brazilian species, cultivated in Martinique, whence it is called *Cerisier de Cayenne*, as it yields a small edible fruit.

EUGENIACRINITES, a genus of fossil *Crinoidea*. (Goldfuss.)

EUGENIN, a substance which deposits spontaneously from the distilled water of cloves; it crystallizes in small laminæ, which are colourless, transparent, and pearly.

EUGENIUS I., a native of Rome, was elected by the Romans, A.D. 654, as successor to Martin I., who had been sent into banishment to the Thracian Chersonésus by order of the Emperor Constans II., who favoured the schism of the Monothelites. Martin dying in the following year, Eugenius continued in dispute with the court of Constantinople till he died in 657, and was succeeded by Vitalianus.

EUGENIUS II., a native of Rome, succeeded Paschas I., A.D. 824, in the midst of great disorder which occurred at Rome owing to the corrupt state of society and mal-administration of that city. To reform these, the emperor, Louis the Good, sent his son Lotharius to Rome, who corrected many abuses. He confirmed the right of electing the pope to the clergy and people of Rome, but under the condition that the pontiff elect should swear fidelity to the emperor before the imperial missus or representative. Eugenius held a council at Rome, in which it was decreed that in every episcopal residence, as well as in every country parsonage, there should be a master for teaching the people and explaining the Scriptures. Eugenius died in 827, and was succeeded by Valentinus, who, dying also after a few weeks, was succeeded by Gregory IV.

EUGENIUS III., a native of Pisa, of the Cistertian order, and a disciple of St. Bernard, succeeded, A.D. 1145, Lucius II. Arnaldo da Brescia was then preaching his reform at Rome, the senate had declared itself independent of the pope, and Eugenius was obliged to take up his residence at Viterbo. After some fighting and many negociations between the pope, assisted by the people of Tivoli and the Romans, Eugenius repaired to France in 1147, and the following year held a council at Rheims. He afterwards returned to Italy, and with the assistance of Roger king of Sicily defeated the Romans and entered the city, A.D. 1149. New disturbances however arose, which obliged him to take refuge in Campania. After having resided some time at Segni he made peace with the Romans, and returned to Rome in 1152. He died the following year, and was succeeded by Anastasius IV.

EUGENIUS IV., Gabriele Condulmero, a native of Venice, succeeded Martin V. in March, 1431. His great struggle was with the family of Colonna, but Eugenius with the assistance of Queen Joanna II. of Naples, obliged them to sue for peace and surrender several towns and castles

which they held in the Roman state. He afterwards made war against the various lords of Romagna, who were supported by the Visconti of Milan. But the greatest annoyance to Eugenius proceeded from the council of Basel, which had been convoked by his predecessor, and which protracted its sittings year after year, proclaiming doctrines very unfavourable to papal supremacy. Eugenius, who had been obliged to escape from Rome in disguise on account of a popular revolt, and had taken up his residence at Bologna, A.D. 1437, issued a bull dissolving the council, recalling his nuncio who presided at it, and convoking another council at Ferrara. Most of the fathers assembled at Basel refused to submit, and Eugenius meanwhile opened in person his new council at Ferrara, in February, 1438. The Catholic world was divided between the two councils; that of Basel proceeded to elect a new pope in the person of Amadeus VIII. of Savoy, who assumed the name of *Felix* V., and was solemnly crowned at Basel.

Eugenius died at Rome A.D. 1447, in the sixty-fourth year of his age. He left the church in a state of schism between him and his competitor Felix, his own states a prey to war, and all Christendom alarmed at the progress of the Turkish arms. He was succeeded by Nicholas V., in favour of whom Felix V. soon after abdicated.

EU'GNATHUS, a genus of fossil Placoid fishes from the lias: thirteen British species. (Agassiz.)

EUKAIRITE, a seleniuret of silver and copper. It occurs in thin films of a shining lead colour, opaque, granular, and readily cut.

EULER, LEONARD, one of the first of mathematicians, was born on the 15th of April, 1707, at Basel, in Switzerland. His father, Paul Euler, was the Calvinistic pastor of the neighbouring village of Riechen.

After being instructed by his father in analytical science, young Euler was sent to the university of Basel, in which John Bernoulli was at that time professor. Such was his progress, that his father was easily dissuaded from his original intention of educating his son for a divine.

A prize having been proposed by the French Academy of Sciences on the management of vessels at sea, the ambition of Euler, then only nineteen years of age, induced him to attempt an essay, which was received with considerable applause, though the prize was conferred on Bouguer, an old and experienced professor of hydrography.

The Academy of Sciences at St. Petersburg was then rising under the patronage of Catherine I., who had invited several philosophers to her capital. On the retirement of Daniel Bernoulli, Euler was appointed professor of mathematics under Peter I. in 1733; soon after which he married a Swiss lady named Gsell, by whom he had a numerous family.

In the memoirs of the Petropolitan Academy, 1729 and 1732, are found several of his memoirs on trajectories, tautochronous curves, the shortest line along a surface between two given points, and on differential equations; besides which he had published at Basel, in 1727, a physical dissertation on sound.

Euler found it convenient at this time to apply himself intensely to study, not more from his natural ardour for the sciences and the incentive of an increasing reputation, than from a desire to avoid the political intrigues which, under a suspicious and tyrannical minister, then agitated Russia.

During this interval he published an excellent treatise on mechanics (Petersburg, 1736, 2 vols. 4to.), a treatise on the theory of music, and one on arithmetic, together with numerous papers in the Petersburg Memoirs, chiefly on astronomical and purely mathematical subjects, among which are contained his views on the solution of Isoperimetrical Problems, which embodied the profoundest researches on a matter of great analytical difficulty previous to the discovery of the Calculus of Variations by Lagrange. Upon the fall of Biren he gladly accepted an invitation from the king of Prussia to visit Berlin. When he was introduced to the queen-dowager in 1741, she was so much struck with the paucity of his conversation that on requiring an explanation, he replied that he had just returned from a country where those who spoke were hanged.

The princess of Anhalt-Dessau, being desirous to profit by the presence of Euler in Berlin, requested to be favoured with instruction on the known facts in the physical sciences. To this wish he fully acceded on his return to Petersburg in 1766, by publishing his celebrated work, 'Letters to a German Princess' (3 vols., 8vo., 1768 1772). During his residence in Prussia he was much employed by the enlightened monarch who then governed that kingdom in questions connected with the mint, with navigable canals, &c.

An incident which occurred in 1760 showed how highly Euler was in general esteemed. The Russians having entered Brandenburg, advanced to Charlottenburg, and plundered a farm which belonged to Euler. When General Tottleben was informed who the proprietor was, he ordered immediate reparation to be made to an amount far above the injury, and the Empress Elizabeth presented him with 4000 florins.

In consequence of his unceasing application to study, Euler had the misfortune to lose the sight of one eye in 1735, and in 1766 that of the other; he however continued his valuable researches, some of his family acting as amanuensis, and his powers of memory are said to have been wonderfully increased even in his old age. He accepted the invitation of the empress Catherine II. of Russia to return to Petersburg in 1766, where he would have fallen a victim to an accidental fire which destroyed his house and property in 1771, but for the courageous efforts of a fellow-countryman (M. Grimon), who bore the old man away in his arms. His manuscripts were saved by the exertions of Count Orloff.

On the 7th of September, 1783, after some calculations on the motions of balloons, then newly invented, Euler dined with Lexell, and conversed on the lately discovered planet Herschel. While playing with his grandchild, who was taking tea, he expired suddenly and without pain.

Euler was twice married in the same family, and had many children and grand-children. His

habit of life was strictly religious, the labours of each day being closed with a chapter from the Bible and family prayer. A catalogue of his published and unpublished writings is given at the end of the Eloge, published by Nicolas Fuss, at Petersburg, in 1783. There is another list (whether copied from the former or not we do not know) at the end of the 2nd volume of the Italian edition of his 'Institutiones Calculi Differentialis,' Ticino, 1787; and to the first is prefixed an eloquent Eloge by Condorcet. The number of Euler's printed works are enormous, and many are still only in manuscript. A full account of them would require volumes: Euler is the most extensive discoverer who ever lived. He has added more to the mathematics than any one else.

EU'LIMA, a genus of marine testaceous Gasteropods, established by Risso. Shell turreted, acuminated, polished, with many whorls; aperture ovate, acuminated posteriorly; external lip thickened, generally forming numerous obsolete varices; operculum horny, thin, its nucleous anterior. The geographical distribution is wide, though principally in warm latitudes, but there are several British species. The species found by Mr. Cuming were dredged or otherwise collected in sandy mud, coarse sand, and coral sand, on mother-of-pearl shells or on the reefs, at depths (not including the reefs) ranging from six to thirteen fathoms. Examples:—*Eulima splendidula.* Locality, Saint Elena, South America. *Eulima major.* Locality, the Island of Tahiti.

According to Mr. G. B. Sowerby, fossil species are found in the *Calcaire Grossier*, near Paris.

EULO'PHIA, a genus of plants belonging to the natural order *Orchidaceæ*. The species are terrestrial plants, with pseudo-bulbous rhizomata. Most of the rhizomata and roots of the species of the family *Orchidaceæ* yield starch in a peculiar form. The roots of the species of Orchis are used in Europe, under the name of Salep, as an article of diet, and the same use is made of the rhizomata of a species of Eulophia in the East Indies.

EUME'DONUS, a genus of brachyurous crustaceans, the first of the Parthenopians of M. Milne Edwards, containing only one known species, *Eumedonus niger*, from the coasts of China.

EU'MENES, of Cardia, a town in the Thracian Chersonese, was an important actor in the troubled times which followed the death of Alexander the Great. [ALEXANDER III.; ANTIPATER; ARRHIDÆUS; PERDICCAS.] Being early taken into the service of Philip of Macedon, he served him for seven years, and Alexander for thirteen, in the confidential office of secretary. He also displayed great talent for military affairs through the Persian campaigns, and was one of Alexander's most esteemed officers. After Alexander's death, in the general division of his conquests, Cappadocia, Paphlagonia, and the coast of the Euxine as far east as Trapezus, fell to Eumenes' share. This was an expectancy rather than a provision, for the Macedonian army had passed south of these countries in the march to Persia, and as yet they were unsubdued. Perdiccas, however, took arms to establish Eumenes in his new government, and did so, at the expense of a single battle. To Perdiccas as regent, and after his death to the royal family of Macedon, Eumenes was a faithful ally through good and evil. Indeed he is the only one of Alexander's officers in whose conduct any appearance of gratitude or disinterestedness can be traced. When war broke out between Ptolemæus and Perdiccas, B.C. 321, he was appointed by the latter to the chief command in Asia Minor between Mount Taurus and the Hellespont (Cor. Nep. c. 3), to resist the expected invasion of Antipater and Cráterus. The latter he defeated; but the death of Perdiccas in Egypt threw the balance of power into Antipater's hands, who made a new allotment of the provinces, in which Eumenes was omitted, and Cappadocia given to another. The task of reducing him was assigned to Antigonus, about B.C. 320. The rest of his life was spent in open hostility or doubtful alliance with Antigonus, by whom he was put to death, B.C. 315. [ANTIGONUS.] Eumenes was an admirable soldier, brave, full of resources, of unbroken spirits. Those parts of Diodorus Siculus (book xviii.), which relate to him, and Plutarch's 'Life,' will be read with pleasure by those who are fond of military adventure. The reader may consult also Droysen, *Geschichte der Nachfolger Alexanders*, Hamburg, 1836.

EUME'NIDES (the 'kind goddesses'), a name given to the Erinyes or Furies, whose business it was to avenge murder upon earth. Every question connected with these divinities is accurately and satisfactorily discussed by Müller in the second essay at the end of his edition of the 'Eumenides,' § 77—98.

EUMORPHUS, a genus of coleopterous insects belonging to the section *Trimeri* of Latreille, and being the typical genus of the family *Fungicolæ*. These insects are characterised by having the antennæ longer than the head and thorax, the body oval, and the thorax irregularly square; the maxillary palpi are filiform, or slightly thickened at the end, but not terminated by a large process as in some genera: the last joint of the tarsus is always deeply divided into two lobes.

Latreille ('Règne Animal') divides the genus *Eumorphus* into several sub-genera. Some of the species have the third joint of the antennæ much longer than any of the other joints: these form the genus *Eumorphus* (proper), in which the antennæ are club-shaped. All the species are natives of America or the East Indies. Example, *Eumorphus immarginatus.* [TRIMERI.]

EUNA'PIUS, one of the Byzantine historians, was born at Sardes, in Lydia, A.D. 347. All that remains of his historical works is contained in the modern edition of the Byzantine historians. There is a complete edition of his works by Boissonade, in 2 vols. 8vo, Amsterdam, 1822, with Wyttenbach's notes, and a life by Hadrian Junius.

EUNO'MIUS, one of the chiefs of the Arian sect during the greater part of the fourth century, was a native of the town of Dacora, in Cappadocia. At Antioch he was ordained a deacon, and about A.D. 360 he was elected bishop of Cyzicus. The divinity of Christ was at this period the all-absorbing subject of ecclesiastical controversy. In defence of unmodified Arianism, Eunomius exerted a high degree of natural ability, asserting

the impossibility of two principles in a simple substance, one of which is generated from the other, and exhibits the relation of a son to his father. The divine essence, he said, is necessarily characterized by oneness and indivisibility; the persons of the Godhead, like the divine attributes of wisdom, justice, mercy, &c., are merely the names of ideal distinctions of the one Supreme Essence, as considered in its different relations with exterior objects, and it is a contradiction and manifest absurdity to suppose this simple essence to consist of a plurality of principles or parts. Eunomius still acknowledged a father, son, and holy spirit, but the father as supreme, eternal, and distinct; the son as generated from the father; and the holy spirit as generated from the son. Eunomius experienced a great severity of persecution without swerving in any degree from the Arian tenets with which he commenced his career. He was thrice banished from his episcopal see; first, by Constantius to Phrygia; then by Valens to Mauritania; and lastly, by Theodosius I. to the Island of Naxos: however he died in peace, at a very advanced age, in the year 394. Most of his works are lost. Two of his treatises are printed in the 'Bibliotheca Græca' of Fabricius, in Greek and Latin (tom. 8, pp. 235—305): 'A Confession of Faith,' presented in 383 to the Emperor Theodosius, and an 'Apologetic Discourse' in 28 chapters. (Cave's *Prim. Christianity*, part 2, c. 11; Pluquet's *Dict. de Hérésies.*)

EUNUCH (*εὐνοῦχος, eunúchus*, literally, 'one who has the care of a bed'). It was usual among the Persians to entrust the care of their wives and daughters to such persons. Tavernier tells us that in the kingdom of Bootan 20,000 eunuchs were annually made in his time, to sell to other nations; and the seraglios of the East are principally served and guarded by them to the present day.

The Christian emperors of Rome forbade the practice of making eunuchs. In Italy however the process of castration is still practised upon children intended to supply the operas and theatres of Europe as singers. The Council of Nice condemned those who from excess of zeal made eunuchs of themselves. Persons so mutilated were not admitted into holy orders. The reader who would know more on this subject may consult the 'Traité des Eunuques,' 12mo., 1707, by M. d'Ancillon.

EUOMPHALUS, a genus of fossil Gasteropoda, from the Palæozoic strata. (Sowerby).

EUONYMUS, a genus of plants belonging to the natural order *Celastraceæ*. *E. Europæus*, Spindle-Tree, is a native of Europe in hedges and thickets, and is found abundantly in Great Britain. The flowers are small, of a greenish white colour, and give out a fetid odour. Its wood is tough and white, and is used for making skewers. Whilst growing wild in hedges and coppices this plant does not attain any great size; but when planted and allowed to grow alone, it becomes a tree, and reaches a height of twenty or thirty feet. Although almost entirely neglected in the planting of pleasure-gardens, it forms a singularly beautiful object in the autumn, when its clusters of red berries are ripe. The seeds are covered with an arillus, which is of a beautiful orange colour. *E. verrucosus* is a deciduous shrub or low tree, a native of Austria, Hungary, and Carniola. This tree has a singular appearance, and is worthy of cultivation on that account amongst collections. *E. latifolius* is a deciduous shrub or low tree, attaining a height of 10–20 feet, and is a native of the south of Europe. Its fruit is large and of a deep red colour: the decaying leaves are also reddish. This is the handsomest species of the genus. It has broad shining leaves, and its large red pendulous fruits, with their orange-coloured seeds, which are suspended in the air when the capsules open, contribute much to the beautiful appearance of this tree. *E. Americanus*, American Spindle-Tree, is a sub-evergreen recumbent shrub, and is a native of North America from Canada to Florida. The capsules are of a deep crimson, the seeds white, and the arillus scarlet. They add much to the beauty of this plant, and have given rise in America to its common name, the Burning Bush. It is of easy culture in a moist soil. Several varieties have been described by botanists. *E. atropurpureus* is found in English gardens, and is a native of America. *E. Hamiltonianus* is a Nepaul species recently introduced. *E. nanus* is a dwarf species. All the hardy kinds are easily cultivated.

EUPATORIA'CEÆ, one of the tribes of composite plants admitted by De Candolle. Under this character are arranged 38 genera, the most extensive of which is the genus *Eupatorium*, including no fewer than 294 species.

EUPATO'RIUM, a genus of plants belonging to the natural order *Compositæ*. *E. cannabinum*, Hemp Agrimony, is a native of Europe, and is mostly found on the banks of streams. It is a common plant in the British Isles. The stem is about three feet high, and has a slightly aromatic smell. The whole plant is bitter, and was formerly employed in medicine as a tonic and febrifuge. An infusion of this plant is said to be the common medicine of the turf diggers in Holland against the ulcerations and diseases of the feet and legs to which they are subject. The expressed juice, when taken in large quantities, produces both vomiting and purging. *E. perfoliatum*, Thoroughwort, is a native of North America in meadows and boggy soils. All parts of this plant are intensely bitter, and a decoction of the leaves has been recommended by American physicians as a valuable tonic and stimulant, and used as a substitute for Peruvian Bark in the cure of intermittent fever. In large doses the infusion or decoction of the whole plant is emetic, sudorific, and aperient. It is used with advantage instead of the infusion of chamomile flowers in working off emetics. *E. Ayapana* is originally a native of South America, on the right bank of the river Amazon, from whence it has been introduced into the East Indies. An infusion of this plant is used in Brazil as a diuretic and diaphoretic. It has also been employed as an antidote against the bites of venomous serpents and insects. Other species of Eupatorium posses medicinal properties. *E. aromaticum* and *E. odoratum* have very fra-

grant roots; *E. perfoliatum* and *E. rotundifolium* have been employed in renal diseases and in consumption.

EUPEN, a town in the circle of Aachen in the Prussian Rhein-Provinz, is situated in a fertile valley on the banks of the Weeze, in 50° 39′ N. lat., 6° 1′ E. long., and has 10,000 inhabitants. It is well built, and with its gardens and meadows covers a considerable surface. It has four churches, an orphan asylum, and large manufactures of kerseymere and fine woollens. The other productions are woollen yarn, soap, chicory, powder, deals, blotting paper, &c. During the French occupation of the province, this town was called Néau.

EUPHO'RBIA, a genus of exogenous plants, giving its name to an extensive and important natural order. The species have either a common leafy appearance, or they are nearly leafless, with their stem excessively succulent, so as to resemble *Cacti*. Those with the former character are natives of most parts of the world, and are the only kinds found in Europe. The succulent species chiefly appear in the hottest and driest countries. Barren uncultivated places in the plains of Hindustan and the arid regions of Asia and the north of Africa are their favourite stations; in the Canaries, on volcanic soil, *E. Canariensis*, and *E. laphylla*, form great bushes with arms like candelabras. From Cacti, which some of these plants much resemble, they are readily known by their spines, when they have any, not growing in clusters, and by their emitting, when punctured, an abundant discharge of milky juice. This, in a concrete state, forms what is called the gum-resin, or rather resin, called Euphorbium, an acrid, corrosive, most dangerous drug, principally furnished by *E. officinarum*, *E. antiquorum*, and *E. Canariensis*. The same properties exist in the herbaceous leafy species, diffused in some, concentrated in others. *E. laphyris*, a common weed in cottage-gardens, where it is called Caper, yields from its seeds an oil of the most violent purgative nature.

EUPHORBIA'CEÆ, a natural order of exogenous plants, with unisexual flowers and tricoccous fruit. Their real affinity is a matter of great uncertainty. Jussieu placed them among his Diclinous Dicotyledons, and probably he was right in so doing; nevertheless there are many strong marks of resemblance between them and Malvaceous, Celastraceous, and even Elæagnaceous plants. The number of *Euphorbiaceæ* is unknown, but certainly very considerable. They vary from trees of the largest size to minute herbs of only a few weeks' duration, and from having both calyx and corolla highly developed to the total absence of those organs. In fact they are constant in scarcely anything except the short character we at first assigned them, and in their sensible properties. Acridity, a virulent corrosive property, which sometimes is so concentrated as to render them most dangerous poisons, and sometimes so diffused as to be of little importance, with all imaginable intermediate qualities, exists throughout the order. Hence some are fatal, others drastic or purgative, and some simply laxative. They also occasionally secrete a farinaceous substance which, being separated from the poison, is valuable for the food of man, as in the Cassava.

Among the more dangerous species of this order are the Manchineel, the *Excœcaria*, which derives its ominous name from its juice producing blindness; and the *Euphorbias*, that yield Euphorbium, Castor oil, and oil of Tiglium. Among other products may be named Cascarilla, the bark of a *Croton*, Turnsole, afforded by a *Crozophora*, Caoutchouc, the produce of *Siphonia elastica*, *Hura crepitans*, and others.

EUPHORBIUM, improperly called a gum, or gum-resin, since it is entirely destitute of any gum in its composition, is the concrete juice of several species of *Euphorbia*, either exuding naturally or from incisions made in the bark. Much of the article found in British commerce is obtained from the *Euphorbia Canariensis*, while that which occurs on the continent is obtained from *Euphorbia officinarum*, *E. antiquorum*, and other African species, particularly from an undescribed species, called by the Arabs *Dergmuse*. The branches of this plant are used in tanning, and to it, according to Mr. Jackson, the morocco-leather owes its peculiarities. By the most recent chemical analysis, euphorbium seems to consist of resin, wax, and saline matter (mostly malates). The resin is the active principle, and differs in some respects from most other resins.

Euphorbium is a powerful acrid substance, causing irritation and inflammation of the parts with which it comes in contact, and by sympathy affecting the nervous system. Delirium and stupor approaching to apoplexy have followed the inhalation of the dust. When swallowed, it causes, in small doses, vomiting and purging; in larger doses it produces inflammation of the stomach, and sometimes proves fatal. It is now little used, even as an external application to produce vesication or ulceration, except by veterinary surgeons. In case of poisoning by it, demulcent or oily fluids should be given, and venesection employed if much inflammation ensue.

EUPHRA'SIA, a genus of plants belonging to the natural order *Scrophulariaceæ*, or *Scrophularineæ*. *E. officinalis*, Euphrasy, Eyebright, is from 1 to 4 inches high, and is a native of the heaths and pastures of Europe, the Himalaya mountains, Cashmere, and all the north of Asia. It is common in Great Britain. This species is peculiarly subject to variation. There is scarcely a character permanent except the pubescence of the corolla. This elegant little plant has a slightly bitter and aromatic flavour, and has been employed much in medicine, particularly in diseases of the eye. Its use in these complaints seems to have originated in its bright appearance, and in times more superstitious than the present, this was supposed to indicate its value in brightening the eyes. *E. odontites* is a native of Europe, and is abundant in Great Britain in meadows, corn-fields, and waste places. This plant is the *Bartsia odontites* of Hudson, and the *Odontites rubra* of Persoon.

EUPHRATES. [TIGRIS.]

EU'PION, a liquid obtained from animal tar, especially that of bones or horns. It is very

limpid, colourless, inodorous, and tasteless; it boils at about 340° Fahr.

EU'PODA (from εὖ, and πούς, ποδός, a foot), Latreille's fifth family of tetramerous *Coleoptera*. The great size of the posterior thighs, in many insects of this family, gives rise to the appellation. The genus *Sagra*, many species of which, remarkable for brilliant red, purple, and green colours, are brought from the East, and the genus *Crisceris*, are types of subdivisions of the family.

EUPOLIS, a writer of the old comedy, was born at Athens about the year 446 B.C., and was therefore a contemporary of Aristophanes. The time and manner of his death are unknown. Aristophanes and Eupolis were not upon good terms. Aristophanes speaks very harshly of his brother poet in 'The Clouds' (551, &c.), and charges him with having pillaged from 'The Knights' the materials for his 'Maricas;' and Eupolis in his turn made jokes on the baldness of the great comedian (Schol. on 'The Clouds,' 532).

EUPOMPUS. [PAMPHILUS.]

EURE, a department in the north of France, formed out of a portion of Haute-Normandie, is bounded N. by the department of Seine-Inférieure, E. by those of Oise and Seine-et-Oise, S. by those of Eure-et-Loir and Orne, and W. by Calvados. It extends from 48° 39′ to 49° 29′ N. lat., and from 0° 20′ to 1° 47′ E. long. Its greatest length from E. to W. is 65 miles, from N. to S. 60 miles. The area is 2249 square miles, and the population in 1841 was 425,780, which gives 189.3 to the square mile, being 21.3 above the average per square mile for all France.

The department presents a varied succession of well cultivated fields, farms inclosed with hedgerows, large forests, hills of moderate elevation, rivers, bustling manufacturing towns, ancient castles, a few marshes in the south-west, and a small extent of coast along the embouchure of the Seine. The surface on the whole is level; the highest elevations, Mont-Roti near Pont-Audemer and the rocky promontory of Quillebœuf, are not more than 300 feet above the sea-level. The department belongs entirely to the basin of the Seine, which river crosses it from S.E. to N.N.W., and divides it into two unequal portions. On the right bank of the Seine, and between the Andelle and the Epte, lies the richly cultivated territory of the Norman *Vexin*, and the forest of Lyons. On the left bank of the Seine there is a series of five plains, which in most instances consist of a dry soil, and have no watercourses except the rivers that bound them. 1. Between the Seine and the Eure is a narrow well-wooded plain, which also extends into the department of Seine-et-Oise. 2. The district between the Eure and the Iton consists of the plain of St.-André and the Terres-Françaises, a portion of the ancient territory of *Perche*, of which Verneuil was the capital. 3. The Iton, the Eure, and the Rille inclose a third level district, the north part of which comprises the old territory of *Roumois*, and is separated from the plain of Neubourg by a series of depressions or valleys that run E. and W. between Montfort and Elbeuf. 4. Between the Rille and its feeder the Charentonne lies a fourth plain, which forms part of the district formerly called Ouche. The Charentonne, the Rille, and the Tongue, inclose the fertile plain of *Lieuvin*, the eastern part of which is in this department, and the western part in CALVADOS.

The department takes its name from the *Eure*, which rising in the department of Orne, runs from N.W. to S.E. into the centre of the department of Eure-et-Loir, whence turning N.E. it passes Chartres and Maintenon. From this last town it runs nearly due N. till it reaches the boundary of the department, along which it runs for a few miles in a N.E. direction, and again turning N. it passes Pacy and Louviers, and enters the Seine on the left bank near Pont-de-l'Arche, after a course of 93 miles. This river was formerly navigated from Chartres to the Seine, but only that portion of it which is within this department is now navigable. The objects of transport along the Eure are salt, timber, and fuel-wood. Its principal feeders are—the *Vesgre*, which joins it on the right bank near Ivry; the *Blaise*, which joins it on the left bank below Dreux; the *Avre* or *Aure*, which flows from the department of Orne along the confines of Eure and Eure-et-Loir, and enters the Eure at the point where that river becomes navigable; and the *Iton*, which rising in the east of the department of Orne, near the monastery of La-Trappe, flows N.E. into the department of Eure, passing Breteuil and Damville; below this last named town it has an underground course for 9 miles, but reappears through numerous springs near Conches, and passing Évreux, enters the Eure at Planches, after a course of 72 miles. The other rivers are —the *Rille*, which rising in Orne, flows in a northern direction through this department, passes Beaumont, Brionne, and Pont-Audemer, from which to its entrance into the Seine it is navigable for large barges: the *Epte*, which rises in Seine-Inférieure, flows in a southern direction along the eastern boundary of the department, and joins the Seine on the right bank a little above Vernon: and the *Andelle*, which rises near the source of the Epte, and flowing S.W. enters the Seine from the right bank nearly opposite Pont-de-l'Arche. On the two last mentioned streams are several important iron works; the other rivers drive the machinery of a great number of corn-mills and paper-mills and factories.

The extensive cultivation of corn in the plains gives them a rich but monotonous appearance. The roads, as in all parts of Normandy, are lined with rows of apple and pear trees. Besides corn of all kinds, more than enough for the consumption, hemp, flax, apples and pears for cider, plums, cherries, teazles, weld, leguminous plants, and garden stuffs, are abundantly grown. Horses of the Norman breed are reared in considerable numbers; sheep are numerous, and esteemed for their flesh. The best fat cattle brought to the Paris markets are from the rich pastures of Roumois and Lieuvin. Hogs of large breed are reared in great numbers. Poultry is abundant and of excellent quality. The vineyards of the department, which are for the most part confined to the valleys of the Eure, the Iton, and the

Seine, yield only 1,320,000 gallons of wine. The annual produce of cider is estimated at 29,700,000 gallons. The most common trees in the forests are oak, elm, beech, maple, and birch. The long rows of lofty poplars in the neighbourhood of the Seine are a characteristic feature in the scenery. Farms range from 30 to 300 acres. The farm houses and farm buildings are mostly built of wood and covered with tiles or thatch. The dwellings of the poorer classes are built of wood and clay, and thatched.

The department is rich in iron ore; building stone, millstones, and paving granite are quarried; fullers' earth and potters' clay are found. There are mineral springs at various places in the department. The manufactures consist of fine and coarse woollen cloths, linen, thread, calico, paper, printed cottons, cotton yarn, cutlery, tape, cotton hosiery, blankets, carpets, wind instruments, horn and boxwood combs, glue, nails, pins, hardware, &c. There are 25 furnaces and foundries for the manufacture of iron, glass-works, numerous flour and paper mills, dye-houses, fulling mills, marble-sawing works, sugar refineries, bleaching grounds, important copper foundries, zinc works, and a great number of tan-yards. The exports are composed of the various agricultural and industrial products named; the imports chiefly of the raw material required in the numerous manufactures, and of colonial produce. There are 698 wind and water mills, and 727 factories of different kinds in the department.

The department is crossed by 12 royal, 26 departmental, and 47 parish roads. It has great facilities for communication by the Seine, and by the Paris and Rouen railroad, which has 34 miles of its length in this department, all, as far as Pont-de-l'Arche, on the left bank of the Seine. From this line two branch railroads are making, one from near the Vernon station through Évreux and Conches, the other from near Pont-de-l'Arche to Bernay, where it meets the former, and is to be continued through Lisieux to Caen.

The climate is variable and moist, but healthy and temperate; winds from the S.W. and the N.W. prevail; fogs are frequent; from 95 to 100 days in the year are rainy.

The department contains 1,439,721 acres distributed among 181,670 proprietors, and subdivided into 1,458,356 parcels. Of this surface 886,792 acres are arable land, 57,354 pasture-land, 85,826 are orchards, nurseries, and gardens, 309,896 are covered with woods and forests, and 46,471 with heaths and marshes. It is divided into 5 arrondissements, which, with their subdivisions and population are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1841.
Évreux . . .	11	287	123,256
Louviers . .	5	120	69,240
Les-Andelys .	6	147	65,348
Bernay . . .	6	144	80,388
Pont-Audemer	8	143	87,548
Total . .	36	841	425,780

The arrondissement of Évreux has ÉVREUX for its chief town. *Breteuil*, a town of 2153 inhabitants, stands on the Iton, 20 miles S.S.W. from Évreux, near the vast forest of Breteuil, and in a country abounding in iron mines. A church, which dates from the 11th century, and the remains of a castle built by the Conqueror, and dismantled in 1378 by Du Gueschin, are the most remarkable objects in the town. The manufactures consist of hardware, nails, pins, copper-wire, iron castings, &c.; there are also iron foundries and smelting furnaces. *Conches* stands on the slope of a little hill above the Iton, 12 miles S.W. from Évreux, and has 2094 inhabitants, who are engaged in the manufacture of iron, hardware, &c. It was formerly defended by a strong castle, of which a great part is still standing. *St.-André-la-Marche* is a small place S. of Évreux, with 1234 inhabitants. A little east of it, near the Eure, is *Ivry*, with 1010 inhabitants, near which Henri IV. defeated the duke of Mayenne, Mar. 14, 1590. A pyramid erected by the duke of Penthièvre to commemorate this victory was demolished in 1793, and restored by Napoleon in 1809. *Nonancourt*, on the left bank of the Avre, formerly a strong fortress and the scene of many an interview between the Norman kings of England and the kings of France, is now a small place of 1529 inhabitants. The house in which Henri IV. slept the night before the battle of Ivry is still shown. *Pacy*, in a very beautiful valley on the Eure, with the remains of ancient walls around it, has a population of 1496. *Rugles*, near the right bank of the Rille, is the centre of a great manufacture of pins and nails; iron wire, hardware, calico, tape, sewing thread, stockings, paper, &c., are also made. It has moreover iron, copper, and zinc works. *Verneuil*, in the south of the department, and near the left bank of the Avre, was formerly defended by a strong castle, of which the keep is still standing, and by three other fortresses, the whole surrounded by ramparts and deep ditches. The fortifications are now for the most part replaced by handsome promenades. The ancient church of La-Madeleine, which is surmounted by a tower richly decorated with sculptured work, is the great ornament of the town. Verneuil has a public library and 3956 inhabitants, who manufacture hosiery, flannels, hardware, pottery, &c., and trade in linen, canvass, wool, and dressed skins for bookbinding. The greatest onion fair in Europe is held here on the 9th of October annually. Under the walls of Verneuil the duke of Bedford in 1424 gained his last victory over the French after a battle which lasted two whole days. *Vernon*, a station of the Paris and Rouen railroad, stands on the left bank of the Seine, which is here crossed by a bridge of 22 arches, leading to the suburb of Vernonnet. It has a college, and 7128 inhabitants, who have no manufactures of importance, but trade to some extent in corn, flour, wine, and cut stone. The town is in general ill built; the streets formed of timber-framed houses are narrow and crooked, but kept clean by running streams. Promenades in the form of boulevards surround the town. The parish church, and the church of the Hotel-Dieu,

an hospital founded by St.-Louis, and an ancient massive tower, are the most remarkable objects. A fine avenue leads from Vernon to the Château de Bizy, which belonged to the dukes of Penthièvre, and from them came to the Ex-King Louis Philippe, who often resided here before his accession to the throne.

In the arrondissement of Louviers, the chief town, *Louviers*, anciently *Loviers*, stands in a valley skirted by extensive woods, and watered by numerous branches of the Eure, 14 miles N. from Évreux, and has tribunals of first instance and of commerce, a chamber of commerce, a conseil des-Prud'hommes, and 9998 inhabitants. The old part of the town, which consists of a few broad streets communicating with each other by a multitude of narrow lanes, is entirely built of wood; the new part is built of brick and cut stone, and presents some pretty streets. The church of Notre-Dame, the nave and choir of which date from 1218, is a very imposing edifice; the south portal, which was completed in 1496, is particularly admired for its bold projections and florid ornaments. The painted windows of this church are distinguished for the angular drawing and quaint designs that characterise an early period of art. The house of the Templars, a most curious specimen of the domestic architecture of the 12th century, the public library, and the theatre, are the other most striking objects in the town. Louviers is one of the chief seats of the cloth manufacture in France; it has upwards of 40 factories, in which from 7000 to 8000 hands are employed. It has been long famous for the finest description of cloths (for uniforms, &c.), which range from 30 to 65 francs an ell. Of late years coarser cloths, cassimeres, fancy goods for trousers, mantles, &c., are also made. There are also several woollen-yarn factories, large tan-yards, bleaching establishments, card factories, steam-engine and mill-work factories, dye-houses, brick-works, &c., and a brisk trade in corn, wood, charcoal, flax, wool, teazles, &c. *Gaillon*, 9 miles S E. from Louviers, on the Paris and Rouen railroad, has 2596 inhabitants, who manufacture carpets, cotton yarn, striped and checked calicoes, &c. The castle of Gaillon, which originally belonged to the dukes of Normandy, and, from the time of St. Louis, to the archbishops of Rouen, was rebuilt in a magnificent style in 1515 by Cardinal Amboise. This building, having been injured and in part destroyed by fire in 1703, was soon after restored. It was sold at the time of the first Revolution, and partially demolished. A beautiful façade which separated the first and second courts of the castle was removed, stone by stone, and reconstructed in Paris in front of the Palais-des-Beaux-Arts, of which it forms the grandest ornament. The castle, which now retains few features of its former magnificence, was fitted up in 1812 as a central house of detention for the convicts of the departments of Eure, Eure-et-Loir, Seine-Inférieure, Orne, and Somme. *Neubourg* stands in a fertile plain S. W. of Louviers, and has 2105 inhabitants, who manufacture cotton, and trade in corn, coarse linen, wool, and cattle. There are here the remains of a fine old Norman castle, rich (as almost every spot in this part of France is) in traditions connected with English history. *Pont-de-l'Arche*, a station on the Paris and Rouen railroad, on the left bank of the Seine, which is here again crossed by a bridge of 22 arches, has 1687 inhabitants, who trade in timber, cattle, fruit trees, &c. The tide ascends the Seine as far as this town.

Of the arrondissement of Les-Andelys, the chief town, *Les-Andelys*, stands in the territory of the Norman Vexin, on the right bank of the Seine, and has a tribunal of first instance, and a population of 5345, who manufacture cloth, cotton, hosiery, linen, pipes, sabots, woollen and cotton yarn, and leather. The town consists of two parts, *Petit-Andely* and *Grand-Andely*. Petit-Andely stands close to the Seine, which is here spanned by a fine suspension bridge of a single arch. A large hospital surmounted by a dome, and an ancient inn built of wood, and called Grand-Cerf, are the most remarkable objects in this part of the town. Grand-Andely is about half a mile inland; it has a very ancient gothic church, and a fine specimen of the domestic architecture of the 16th century in the house called La Grande Maison, now used as a granary. On an eminence above the town stand the still majestic ruins of Cœur-de-Lion's famous fortress of *Château Gaillard*. From the Côte-des-deux-Amants, a hill which stands above the village of *Amfreville*, near the junction of the Andelle with the Seine, and connected with which there is an interesting local tradition, there is one of the finest views in Normandy, comprising the valleys of the Seine, the Eure, and the Andelle, the towns of Louviers and Elbeuf, with numerous bridges, old castles, forests, factories, and villages. *Villiers*, a small place near Les-Andelys, was the birthplace of N. Poussin. *Gisors*, in a fertile plain on the Epte, is surrounded by walls and ditches, and was formerly defended by a castle, the keep of which is still standing. The church, dedicated to St.-Gervais and St.-Protais, dates from the 13th century, but having been often repaired it presents various styles; the portal is in the Renaissance style, and the finest specimen of the kind in Normandy. The interior contains a curious monument on which the representation of a dead body is sculptured in marble. The town has 3624 inhabitants, some cotton-spinning and bleaching establishments, tan-yards, and breweries. In the neighbourhood there are copper and zinc works. *Fleury-sur-Andelle*, a mere hamlet in 1830, has now a population of 1065, cotton factories, print-works, and brick and lime kilns. *Lyons-la-Forêt*, 14 miles N. from Les-Andelys, is built round and on the site of the ancient castle in which William Longsword died and William the Bastard spent part of his youth. There was a town here in Roman times. The population is 1524.

In the arrondissement of Bernay, the chief town, *Bernay*, stands on the left bank of the Charentonne, has tribunals of first instance and of commerce, a college, savings' bank, and 6871 inhabitants. Judith de Bretagne, Richard II.'s queen, had this town as part of her dowry, and

founded an abbey in it. The abbey church, the nave of which is remarkable for its severe simplicity and unadorned elegance, is now used as a corn and linen market. In the abbey buildings the sub-prefect and the mayor reside, and the courts of justice are held. The other important buildings are the churches of Sainte-Croix and De-la-Couture, the college, and the hospital. The chief manufactures are woollen cloth; but flannels, tape, linen, leather, &c., are made. There are also dye-houses and bleaching establishments, and a good trade in corn, cider, iron, paper, hides, and cattle. One of the greatest horse fairs in France is held here during the fifth week of Lent. *Beaumont-le-Roger*, on the right bank of the Rille, and near the fine forest of Beaumont, was formerly defended by a castle, which was for centuries an object of contention with the Normans, French, and English, but which is now in ruins. The town has cloth factories, bleach-works, glass-works, and 2063 inhabitants. *Brionne*, N.E. of Bernay, an ancient town on the right bank of the Rille, has 3098 inhabitants, who manufacture cloth, oil, and cotton yarn. Four Roman roads met at Brionne; some Roman remains are seen in the adjacent forest. The Norman castle that formerly commanded the town is now in ruins. *Broglie*, S.W. of Bernay, is a small place of 1024 inhabitants, from which the Duc de Broglie takes his title, and near which he has a large mansion surrounded by a fine park. *Thiberville*, W. of Bernay, has a population of 1344.

Of the arrondissement of Pont-Audemer, the chief town, *Pont-Audemer*, 40 miles N.W. from Evreux, is prettily situated on the left bank of the Rille, which here becomes navigable. It is surrounded with walls and wet ditches. The streets are regular, well built, and kept clean by running streams. The town has public baths, a small theatre, and 5497 inhabitants, who manufacture hosiery, glue, harness, and cotton yarn; it has 40 tan-yards, 12 currieries, and 12 establishments for dressing sheep skins and glove leather. There is also some trade in corn; cider, flax, hides, &c. *Beuzeville*, W. of Pont-Audemer, has brick kilns, oil mills, and 2610 inhabitants, who trade in corn, horses, cattle, and sheep, for the sale of which large fairs are held. *Cormeilles*, near the Calonne, a feeder of the Touque, on the old Roman road from Lisieux to Lillebonne, has 1373 inhabitants. *Quillebœuf*, on a promontory which juts out into the Seine, and on the extremity of which stands its massive church tower and light-house, is a small place of only 1447 inhabitants. It is important as a place of anchorage for large vessels making for Rouen, which here unload part of their cargoes, and as a station for pilots, who are indispensable to guide ships through the shifting sand-banks in this part of the river. The Bore, at the mouth of the Seine, is observed to great advantage from this place. [Bore; Seine.] *Routot* and *St.-Georges-du-Vièvre*, are small places of a little over 1000 inhabitants each, which give name to the other cantons.

The department forms the see of the bishop of Evreux, is comprised in the jurisdiction of the Cour Royale and University Academy of Rouen, and belongs to the 14th Military Division, of which Rouen is head quarters. It used to return 7 members to the Chamber of Deputies; it now has 11 representatives in the National Assembly. (*Dictionnaire de la France; Annuaire pour l'An* 1847; Murray's *Handbook for France*.)

EURE-ET-LOIR, a department in France, formed out of parts of Orléannais and Maine, is bounded N. by the department of Eure, N.E. and E. by Seine-et-Oise, S. by Loiret and Loir-et-Cher, and W. by the departments of Sarthe and Orne. The districts of Orléannais included in the department are—*Beauce*, which covers all the east and part of the south of the department, and a portion of which about the city of Chartres took the name of *Chartrain*; and *Dunois* in the south-west, of which Chateau-Dun was the capital. The west of the department, including the arrondissement of Nogent-le-Rotrou, and a portion of that of Dreux, consists of a part of *Haut-Perche* and *Perche-Thimerais*, districts of Maine, which had Nogent-le-Rotrou and Château-Neuf for their respective capitals. The department extends from 47° 57′ to 48° 56′ N. lat., and from 0° 47′ to 2° E. long. Its length from N. to S. is 68 miles; its breadth varies from 57 to 36 miles. The area is 2117 square miles, and the population in 1841 was 286,868; which gives 135.37 to the square mile, being 32.73 below the average per square mile for all France.

The department lies high upon the watershed which sends its rivers to the Bay of Biscay and the English Channel. The surface is in general level, the Beauce districts consisting of vast plains destitute of watercourses, springs, and trees; but the south and west of the department is more diversified, and presents hills, well-watered valleys, and in some places ponds and marshes. It takes its name from the two rivers that drain it—the Eure described in last article, and the Loir which rises in the department and drains its south-western districts, receiving the Thironne, the Ozanne, the Conie, and the Yère. [Loir-et-Cher.] The only other river is the Huisne which just enters the west of this department. [Orne.] None of these rivers are navigable.

The soil in all the eastern and southern parts is fertile, well cultivated, and admirably adapted for growing wheat. The corn produced in these districts is of the best quality; it is for the most part sent for the supply of Paris, La-Beauce having been at all times considered the granary of that capital. In the Perche districts, the culture of bread-stuffs is joined to that of apples for making cider, which is more agreeable than the cider of Normandy, but not so strong. Here the farms are divided by hedges, and the country having vine-yards on the hill sides, and a tolerable clothing of trees, is called the 'covered country' to distinguish it from the bare plains of Beauce. Besides wheat, rye, barley, oats, leguminous plants, teazles, weld, flax, hemp, &c., are grown. Hops grow spontaneously in some districts of this department. Oak and birch are the prevailing trees of the forests. Horses are bred by the farmers of Perche; horned cattle are deficient in numbers, owing to the small extent of grass land; sheep valued for

the fineness of their wool, pigs, and poultry, are numerous and abundant. Of game there are hares, rabbits, red and gray partridges, plovers, lapwings, &c. The rivers contain carp, trout, pike, and crayfish.

The villages and hamlets of Beauce are built of clay and thatched, and are in general far apart. In Perche they are built of clay and stone, and covered with tiles, staves, or sometimes with heath; but in this district the hamlets are very numerous. The people of the plains are called Beaucerons; the people of Perche are called Percherons. The peasants of both districts commonly wear the blouse, and the heavy sabots. The costume of the women of Perche is neat and picturesque; the women of Beauce, though clothed in more costly stuffs, are not distinguished for taste in their costume.

The department is essentially agricultural, and, except in the arrondissement of Dreux, the manufactures are not very important. The number of wind and water mills for the manufacture of flour is 684, and 400 of these are driven by the waters of the Eure and the Loir. Along the course of the Avre or Aure there are important paper-mills belonging the Messrs. Firmin Didot. There are also numerous other paper-mills, tanning and fulling-mills, cotton-spinning factories, 5 iron forges and furnaces (which are supplied with ore partly from the mines of the department, and partly from those of Eure), and 526 factories and workshops of different kinds. Besides the articles indicated, flannels, serges, druggets, blankets, linen, sieves, and woollen hosiery, are manufactured and exported. A great number of caps are knitted of the fine wool of Beauce or of Spain, and sent to Orleans, where they are dyed of different colours, and form an important article of export. The imports are wine, brandy, timber, wool, cloth, colonial produce, &c. Stone, marble, granite, and gypsum are quarried. Marl is very abundant, and is used for manure. Brick-clay and potters' clay are found. There are mineral springs, near Chartres, and in the park of Ferté-Vidame.

The surface measures 1,354,940 acres, which are distributed among 144,494 proprietors, and subdivided into 1,366,974 parcels. Of arable land there are 1,075,634 acres, of grass land 55,801 acres, of woods and forests 138,918 acres, of orchards, nurseries, and gardens, 14,782 acres, of vineyards 12,605 acres, and of heath and marsh land 13,900 acres. The amount of wheat exported to Paris and Orleans from the Beauce district alone in ordinary years is 412,500 quarters. The annual produce of wine is only 2,332,000 gallons; it is all of ordinary quality and consumed at home. Of cider the ordinary produce is about 3,850,000 gallons.

The department is crossed by 8 royal and 7 departmental roads. The Paris and Orleans railroad runs for some miles along the south-eastern boundary; and a railroad is now making from Versailles through Chartres, a few miles W. of which it sends a branch through Nogent-le-Rotrou to Le-Mans, while the main line runs to Séez and Alençon.

The climate is healthy; the temperature is not subject to sudden changes. The heat of summer is seldom oppressive; the winters are cold and dry; fogs are not unfrequent; a good deal of snow falls in the winter; and the crops often suffer from hailstorms. The prevailing winds are the east and west. The west wind blows at times with such violence as to carry the sea-birds into the middle of the plains of Beauce.

The department is divided into 4 arrondissements, which, with their subdivisions and population, are as follows:

Arronds.	Cantons.	Communes.	Pop. in 1841.
Chartres . .	8	„	106,570
Château-Dun .	5	„	68,618
Dreux . . .	7	138	70,845
Nogent-le-Rotrou . .	4	65	46,335
Total . .	24	463	286,368

The arrondissement of Chartres has CHARTRES for its chief town. *Auneau* is a small place E. of Chartres, with some hosiery manufactures and 1652 inhabitants. *Bretigny*, 6 miles from Chartres, gave name to the treaty (1360) by which Edward III. resigned his claim to the throne of France. *Courville*, on the slope of a hill above the Eure, has a population of 1547. Near it is the fine old castle of Villebon, in which Sully died in 1641. *Gallardon*, N.E. of Chartres, has a remarkably fine gothic church, which dates from the 12th century; population 1454. *Illiers* on the left bank of the Loir, has the remains of a fine old castle, and 2916 inhabitants, who manufacture cloth, blankets, hosiery, leather, tiles, and bricks. *Janville*, a small place near the Paris and Orleans railroad, has 1086 inhabitants. *Maintenon*, N.E. of Chartres, is a well built town at the junction of the Voise and the Eure, and is remarkable for its magnificent castle, first built by Philippe Auguste, and afterwards rebuilt by Louis XI. and Charles VIII. This castle was the residence of Madame de Maintenon, Louis XIV.'s mistress. Near it are seen the ruins of the aqueduct commenced by Louis XIV. to bring the waters of the Eure to Versailles. A great portion of the works were demolished by Louis XV., who wanted the materials to build the castle of Crecy near Dreux, for his mistress the Marchioness de Pompadour. There is a well preserved Roman camp and several Druidical monuments near this town. *Voves*, 12 miles from Chartres, has 1283 inhabitants, who manufacture caps and gloves.

In the arrondissement of Château-Dun the chief town, *Château-Dun*, stands in 48° 4′ N. lat., 1° 20′ E. long., on a hill above the Loir, which flows in two arms through a narrow valley of great beauty and fertility, shut in by hills which are covered with vines and plantations. The town was almost entirely destroyed by fire in 1723, and has been since rebuilt on a regular plan. The streets are all straight, and abut in a spacious square on the summit of the hill, from which the whole town can be seen. The castle, one of the

towers of which was built in 935 by Thibault le-Tricheur, is a remarkable structure; from it there is a fine view of the town and the beautiful scenery of the neighbourhood. Château-Dun has 6680 inhabitants, a tribunal of first instance, a college, public library, and some important manufactures of blankets and leather. *Bonneval*, a busy manufacturing town with 2671 inhabitants, stands N.E. of Château-Dun. A little way out of the town on the road to Chartres is seen the Château of Condreaux, once the residence of Marshal Ney. There is a large dolman in a prostrate condition a little E. of the town. *Brou*, on the Ozanne, has 2444 inhabitants, who manufacture linen, serge, sieves, tiles, and weaving gear. *Cloyes*, prettily situated on the left bank of the Loir, a few miles S. of Château-Dun, has 2324 inhabitants, beet-root-sugar factories, and tan-yards. *Orgères*, a small place 16 miles E. from Château-Dun, gives name to a large forest in which there is a vast quarry that furnished stone to build the cathedral of Chartres. This quarry became the retreat of a desperate band of robbers from 1797 to 1800.

Of the arrondissment of Dreux the chief town is DREUX. *Anet*, in the north-east of the department, and in a neighbourhood rich in historical associations, stands on the right bank of the Eure, and has 1409 inhabitants. *Château-Neuf*, a well built town in the Perche district, stands near a large forest S.W. of Dreux, and has 1352 inhabitants. Near to it westward is *Digny*, with a population of 1283. *Ferté-Vidame*, a small place, deserves mention for its fine old castle and park. *Nogent-le-Roi*, S.S.E. from Dreux, on the left bank of the Eure, has 1336 inhabitants. Philippe de Valois died here in 1350. *Senonches* situate at the edge of a large forest near the source of the Blaise has steam engine factories, iron-foundries, and smelting furnaces. The inhabitants number 1973, and trade in timber, charcoal, and lime.

In the arrondissement of Nogent-le-Rotrou the chief town is *Nogent-le-Rotrou*, which takes its distinctive designation from Rotrou, a count of Perche. It stands in the beautiful valley and on the left bank of the Huisne, at the foot of a steep hill, on the summit of which is an ancient gothic castle, once the residence of Sully. The town is in general well built; in the interior there is a square formed of good houses and lined with fine trees, which inclose a large space of green sward and afford an agreeable promenade. It has 3 churches, 3 hospitals, a tribunal of first instance, a college, chamber of commerce, and 6929 inhabitants, who manufacture serge, drugget, sieves, cotton yarn, and leather. There are dye-houses and fulling-mills; and at the entrance of the town several mills are driven by the waters of a cascade formed by the little river Arcise. The town trades also in linen, hemp, clover-seed, hay, and straw. Sully's tomb in the chapel of the Hôtel-Dieu, on which there is a long eulogistic inscription, escaped the fury of the first revolution; but his bones were torn out of their resting place and dispersed. *Authon*, S. of Nogent, has 1584 inhabitants. *La-Loupe*, N.N.E. of Nogent, has 1161 inhabitants; and *Champond*, a small place E. of Nogent, has iron mines, iron works, and peat beds.

The department forms the see of the bishop of Chartres, is comprised in the jurisdiction of the Cour Royale and University Academy of Paris, and belongs to the 1st Military Division, of which Paris is head quarters. It used to send 4 members to the Chamber of Deputies; it now has 7 representatives in the National Assembly.

(*Dictionnaire de la France; Annuaire pour l'An* 1847: *Decree of the Provisional Government of the French Republic.*)

EURIPIDES of Athens is said to have been born at Salamis in B.C. 480. His father Mnesarchus and his mother Clito seem to have been Athenian citizens of the poorer class. Euripides devoted himself early to the study of philosophy in the school of Anaxágoras, as well as to that of eloquence under Pródicus. He is said to have commenced writing at the age of eighteen; and in the course of a long life he composed seventy-five tragedies, or, according to other authorities, ninety-two; and notwithstanding the satirical attacks which, in the author's own time, they sustained from such as were exclusively attached to the elder tragic school, they secured him for all succeeding ages a place beside its two great masters. When upwards of seventy years old he accepted the invitation of Archeláus, king of Macedon, and went to live in tranquil retirement at his court. He is said to have died in consequence of being torn by the king's hounds.

Of the numerous tragedies of Euripides, nineteen survive—a much larger proportion than has descended to us of the works either of Æschylus or Sophocles. 'The Electra' of Euripides, one of the least meritorious of his extant plays, affords the clearest means of comparison between his most prominently distinctive features as a dramatist and those of his two great predecessors; this being the only instance in which we have a piece from each and all of the three composed upon the same historical or mythological subject. 'Orestes,' the subject of which, inasmuch as it relates to the persecution of that hero by the furies of his mother and his proscription as a matricide, is the same as that of the 'Eumenides' of Æschylus, though in scene, incident, and character, excepting that of Orestes himself, they are wholly different, is more vigorous and more affecting than the 'Electra.' For moral sentiment and unaffected yet overpowering pathos, his 'Ion,' his 'Iphigenia in Aulis,' and, above all, his 'Alcestis,' are peculiarly distinguished. He found subjects especially suited to the development of his finer powers in the purity and sanctity of the youth from whom the first of these three tragedies is named, in the unsuspecting innocence of the heroine of the second, and in the tender yet resolute devotedness of connubial affection portrayed in the third. The 'Hippolytus' and the 'Medea,' exhibiting all the romantic violence of irregular and vehement feminine passions, are among the greatest and most successful works of this dramatist.

The 'Cyclops' is the sole remaining specimen of the *satyric* drama, so called from the chorus of satyrs, which formed an essential part of its

composition. It seems that the satyric drama was never acted but as a kind of shorter and lighter after-piece, for which purpose it appears to have been very constantly employed, each tragic trilogy being almost invariably accompanied by one of these shorter and lighter productions. Notwithstanding its burlesque ingredients, the tragic character was so far preserved in the satyric play, that the subject appears to have been always historical, and the action partly serious, though with a fortunate catastrophe. The piece of Euripides has for its subject the adventure of Ulysses with Polyphémus, as related in the 'Odyssey,' with the addition of Silenus and his satyr band; the characters are accurately discriminated and consistently maintained; and the nature of the plot produces such natural contrasts and even blendings of the ludicrous with the horrible, as, above all things else, render this drama unique among the Grecian remains.

The editions of Euripides are numerous. The last complete editions are by Aug. Matthiä, Leipzig, 1813, and by F. H. Bothe, Leipzig, 1825. The editions of separate plays are also numerous; among which that of the Hecuba, Orestes, Phœnissæ, and Medea, by Porson, is the best known. Euripides has been translated into German by F. H. Bothe, and into English by Potter.

EUROPE is one of the great divisions of the globe, forming the north-western part of the old continent. The surface is calculated to contain about 3,900,000 square miles.

Europe is separated from America by the Northern Atlantic, which washes its western and northern shores, and from Africa by the Mediterranean Sea. The boundary-line which divides Europe from Asia is only in part indicated by nature. This line runs through the Archipelago, the straits of the Dardanelles, the sea of Marmara, and the straits of Constantinople, to the Black Sea, which is traversed by it. It then traverses a line, rather vaguely defined, along the Caucasus, and through the Caspian Sea, the Ural river, the Uralian Mountains, and the river Kara.

The most northerly point of Europe is North Cape, in 71° 10′; the most southern is Punta de Tarifa, in Spain (36° N. lat.); the most western is Cape Roca (9° 28′); and the most eastern point is in the Uralian Mountains, west of Ekaterinburg (60° 20′ E. long.). But some of the islands extend farther south and west than the continent. A straight line drawn from Cape St. Vincent to the mouth of the river Kara on the Frozen Ocean gives the greatest length of Europe, about 3000 miles; and another drawn from Cape Matápan to Cape Nord Kyn is 2400 miles.

Progress of Discovery.—The earliest notices of Europe are in the writings of the Greeks. Homer, who probably lived about 1000 years B.C., was acquainted with the countries round the Ægean Sea or Archipelago, and on the south coast of the Black Sea. About the 6th century B.C. the Greeks began to form settlements in the southern parts of Italy and on the Island of Sicily. In the time of Herodotus (450 B.C.) the countries on each side of the Mediterranean Sea and the northern shores of the Black Sea were pretty well known to the Greeks. After the Romans began their conquests the interior of Europe became gradually known. The conquest of Italy was followed by that of Spain and the southern parts of France; and not long afterwards Sicily, Greece, and Macedonia were added. Cæsar conquered Gallia and the countries west of the river Rhine. His two expeditions into Britain made known also in some measure the nature of our island and its inhabitants. The countries eastward of the Rhine, being for the most part plains inhabited by barbarous tribes, resisted the attacks of Rome for a longer period.

New tribes were brought within the knowledge of Western Europe by the exertions of Christian missionaries. After the fall of the Western Empire, missionaries penetrated into Eastern Germany. In the 9th century, others went from Constantinople into Russia; in the 10th century christianity, and with it geographical discovery, travelled into Poland; and into Prussia in the 13th century. The pirates of Scandinavia, during their attacks on the coasts of Western Europe, revealed much knowledge concerning their own country; and the exploring voyages and travels of later times made known the extreme northern and sterile regions of Europe.

Physical Geography.—Nearly two-thirds of the surface of Europe consist of an immense plain; the remainder is partly mountainous, and partly hilly. The plain occupies the east part of the continent; and the hilly and mountainous countries extend along its western and southern shores. This conformation divides the mountain system of Europe into two great groups, which may be termed the Scandinavian and the South European mountain systems. The Great Plain occupies about 2,500,000 square miles; the Scandinavian System, 300,000 square miles; the South European System, 1,000,000 square miles.

Scandinavian Mountain System.—This comprehends the whole of the Scandinavian peninsula, or Sweden and Norway. A line drawn from the mouth of the river Torneo, at the most northern angle of the Gulf of Bothnia, to the Waranger Fiord, a bay of the Arctic Ocean, would separate it from the north-western part of the Great Plain. A huge mountain-mass occupies the west part of this peninsula. It rises on the very shores of the sea to a height of some hundred feet, and attains, at a short distance from it, an elevation of 3000 or 4000 feet. South of 63° N. lat. it has not the form of a mountain-range, but of a mountain-plain, its surface frequently presenting a perfect level, and in some places swelling into hills. This elevated plain is from 100 to 150 miles across, and as it attains in many parts the line of perpetual congelation, which in this latitude is about 4200 feet above the sea, a great portion of it is always covered with snow. Both shores of the plain are deeply indented with inlets, or fiords. A few summits on the plain reach 8000 feet in height. North of 63° N. lat. the mountains assume the form of a ridge, very precipitous on the western side, but sloping more gradually on the east. Minor branches spring from this ridge, and include between them many lakes. Iceland, and

the Faroe Islands, which are included in Europe, present the same kind of elevated mountain-plain as Norway and Sweden.

Though the Scandinavian Mountains are not visibly connected with the South European Mountain System, yet Great Britain may be conceived as forming such a link. The northern part of Scotland consists mainly of an elevated plain, studded here and there with mountains. But farther south the Scandinavian character of the country is lost, and the surface presents the broken character of ridges, valleys, and plains.

South European Mountain System.—This system, which extends over the whole of South Europe, from Cape La Roca in Portugal to the Straits of Constantinople, presents a surface more diversified in its form than any other portion of the globe of equal extent, China perhaps excepted. A sort of valley traverses the district from N. to S., about 4° to 8° E. long., containing considerable portions of the rivers Rhine, Saone, and Rhone. A plain also traverses the district from the Bay of Biscay to the Mediterranean, cutting off the Spanish from the French mountains. The Pyrenees, which bound this plain on the south, rise to a height of 6000 or 7000 feet, with isolated peaks 10,000 or 11,000 feet high. The north-east flank of these mountains rises very abruptly; but the south-west runs off into long mountainous slopes. South of the mountain chain of the Pyrenees the peninsula is mostly occupied by a table-land, diversified with mountains.

The country between the plain of the Garonne and the valleys of the Rhone and Rhine contains also an elevated region, rising to between 2000 and 3000 feet above the level of the sea. On its surface rise three chains of mountains, which enclose the valleys of the Allier and of the Upper Loire. The most western part is called the mountains of Auvergne, the middle the mountains of Forez, and the eastern range the Cevennes. The country north of these mountains gradually declines to a low plain.

The country to the east of the central valley of the Rhine and Rhone comprises the great Alpine region, which at its southern extremity joins the Apennine chain of Italy. These two regions are described under ALPS and APENNINES. The islands of Sardinia, Corsica, and Sicily, contiguous to Italy, are all of a mountainous character.

North of the Alps, and extending from the Rhone to the Rhine, are the Jura Mountains, which consist of a number of parallel ridges. Northward of this is the long mountain range of the Black Forest, still further continued by the Odenwald. Between the Rhine and the Danube is a hilly country, which may be considered as the commencement of the elevated plain of Bavaria, and which is about 180 miles long by nearly the same in breadth. This plain does not extend far enough north to reach the Great Plain, being divided from it by a mountain-region which extends between 50½° and 52° N. lat. over the whole of Germany. To the south of the eastern part of this mountain-range is the elevated valley of Bohemia, almost entirely surrounded by mountains from 3000 to 5000 feet in height.

At the eastern extremity of this mountain system, where the rivers Oder and Morava take their origin, the Carpathian Mountains commence. The length of this range does not fall much short of 800 miles; its breadth is not very considerable, in a few places only exceeding 70 or 80 miles. Its mean elevation may be between 3000 and 4000 feet. Spreading out from the offshoots of this chain lies the plain of Hungary, which is about 300 miles from north to south, and nearly as much from east to west. The Danube traverses it. There are only a few hills in this plain. Between the Carpathians and the lower course of the Danube is the plain of Wallachia, smaller than that of Hungary.

The Balkan, with its numerous branches, traverses the most eastern of the three great southern peninsulas, which advance from the body of the continent into the Mediterranean Sea. The Balkan range is not disjoined from the Alps by any natural separation, but is so closely connected with them as to form a continuation of that mountain system. Geographers have however assumed a dividing line about 18° E. long. This very rugged region is described under BALKAN. The peninsula of the Morea, which is joined to the mainland of Northern Greece by a narrow isthmus, partakes of the mountainous character of the Balkan district.

The Great Plain.—Beginning at its western extremity, we find that between the mouths of the Schelde and the Elbe, the country hardly in any place rises to more than 100 feet above the sea. Its surface is covered with a succession of moors and heaths, ill adapted for agriculture, except in the alluvial tracts along the rivers and sea-shores. The countries between the Elbe and the Vistula are more fertile. This part of the Great Plain is drained by rivers which originate in the mountain-region south of it, and traverse it in a north-western or northern direction. But east of the upper branches of the Vistula, the rivers originate in the plain itself which they drain. These rivers run either north-west and north to the Baltic Sea and White Sea, or south and south-east to the Black Sea and Caspian Sea. The watershed which separates their sources begins about 23° E. long. on the northern declivity of the Carpathian Mountains. North-east of this watershed is an immense swamp, the largest in Europe, being about equal in area to England. The watershed is continued eastward from the swamp, and in some few places reaches a height of 1000 feet. The portion of the Great Plain north of the watershed is in general of moderate fertility; it contains a good many lakes, but scarcely any elevations except mere hills.

By far the greater part of the Great Plain extends to the south of the watershed. Contiguous to the southern declivity of this watershed extends a country of great fertility, from 300 to 400 miles in width. It begins on the west near the foot of the Carpathian Mountains and terminates on the east at the Volga. Beyond this river the country is more mountainous. South of this fertile region extend the deserts which are called the Steppes. They may be divided into

the Higher and Lower Steppes, the line of separation between them being the high ground which extends north and south between the Don and Volga. The Higher Steppes occupy the western part of the plain, extending south of the fertile region to the very shores of the Black Sea. Their elevation above the sea may be between 150 and 200 feet. The Lower Steppes are at the south-eastern extremity of Europe. They occupy a space more than twice as large as the area of the British Islands. The southern part is lower than the level of the sea, the Caspian Sea being more than 300 feet beneath it, and the adjacent country rising very little above its shores.

Seas and Rivers.—Looking at the map of Europe we find that its coast-line is formed alternately by wide projecting promontories and deep bays. In proportion to its surface, it presents a much greater extent of coast than any other of the great divisions of the globe.

	Surface in square miles.	Coast-line. Miles.
Asia . . .	18,000,000	35,000
Africa . . .	14,000,000	16,000
Europe . .	3,900,000	20,000
America . .	15,000,000	32,000

(omitting Arctic Coast.)

The Atlantic Ocean forms the Bay of Biscay, the English Channel, St. George's Channel, and the North Sea. The close seas, which are united to the Atlantic by straits, are the White Sea, the Baltic, and the Mediterranean; with the latter the Black Sea and the Sea of Azof are connected. The chief characteristics of these seas are noticed under ATLANTIC; BALTIC; BLACK SEA; MEDITERRANEAN; &c. The areas of the inland seas are about as follow:—

Seas.	Extent sq. miles.
Mediterranean . . .	760,000
Black Sea and Sea of Azof .	190,000
Caspian	180,000
Baltic	160,000
White Sea	40,000

Most of the great European rivers flow into one or other of these seas. The Caspian receives the Volga and the Ural, which drain 850,000 square miles of country. The Black Sea receives the Danube, Dnieper, Dniester, Don, and Kuban, which drain 900,000 square miles (in Europe). The Baltic receives the Oder, Vistula, Niemen, Düna, and the Scandinavian Rivers, which drain 900,000 square miles. The Mediterranean receives the Rhone, Ebro, Po, Tiber, &c., which drain 250,000 square miles. The rivers which flow at once into the Atlantic, without the intervention of these inland seas, though very numerous, are comparatively small, and drain only about 600,000 square miles.

Climate.—The climate of Europe presents great differences, if we compare it with that of those countries in other divisions of the globe which lie within the same parallels. It is a well established fact, that the eastern coast of North America is much colder than the western coast of Europe, under the same latitudes. This difference is in some places equal to 10° of latitude. It is however worthy of remark, that the eastern countries of Europe, especially those north of the Black Sea, are much colder, and approach in climate those of the eastern coast of America. This difference in the climate of Europe may perhaps in part be explained by the circumstance that this continent is enclosed on most sides by seas whose water is warmer than that of the ocean at large.

With respect to climate, Europe may be divided into three zones, the northern, the central, and the southern. In the northern zone only two seasons occur, summer and winter, the former lasting about three months, and the latter nearly nine months. These seasons are separated by a spring and autumn of a few days' duration, rarely two weeks. In summer the heat is very great, and the vegetation inconceivably rapid. The winter is severe and boisterous, and brings down immense quantities of snow. In the central zone the four seasons are distinct, and the passage from heat to cold and *vice versâ* is very gradual. The heat is less than in the northern zone, and so is the cold during the winter. In the southern zone frost is either not felt at all or only during a few days; and snow is of rare occurrence, or it does not lie on the ground for more than a few days. Vegetation accordingly is very little interrupted. But the countries within this zone have abundant rains during the last three months of the year, and are subject to great and long droughts in summer. These droughts frequently continue for four or five months, and in some places occasionally for eight or nine months.

Inhabitants:—Nearly the whole population of Europe belongs to that race which is comprehended under the name of the Caucasian race; but along the Uralian range, and at the most northern extremity of the continent, a few nations occur which belong to the Mongolian race; to which must be added the Magyars, who inhabit nearly the centre of Europe (Hungary).

The inhabitants of the Caucasian race may be divided into three great branches and several smaller ones, if we consider them with reference to their language. The first division comprehends those languages which are in great part derived from the Latin. They are the Italian, Spanish, Portuguese, and French languages. The second great branch is formed by those of Teutonic origin. These languages are spoken by the inhabitants of England, a great part of Scotland and Ireland, Iceland, Norway, Sweden, Denmark, Germany, and the Netherlands. The third great branch is the Slavonian, which has various dialects in Bohemia, Silesia, Poland, Russia, Dalmatia, Croatia, Bosnia, Servia, and Bulgaria. Besides these three great branches, dialects of the ancient Celtic language are spoken in Scotland, Ireland, Isle of Man, Wales, and Brittany.

The inhabitants who do not belong to the Caucasian race comprise the following:—The Magyars occupy great part of Hungary; the Lapps, the Finns, and the Samoyeds, live near the Arctic Circle; while the Inghers, the Esthonians, the Livonians, the Permians, the Wogules, and the Wotyakes occupy parts of the Russian Empire: all these are of Mongol stock. To these may be added the few Calmucks, Khirghises, and Bash-

kirs, who are on the European side of the Ural. The Lithuanians and the Courlanders speak languages peculiar to themselves. The south-east of Europe is occupied by the Wallaches, the Turks, the Tartars, the Albanians, and the Greeks, all of whom have their peculiar characteristics of origin and language.

The population of Europe is calculated to amount to about 245 millions. The Romish religion is professed by the inhabitants of Portugal, Spain, and Italy; by the majority in France, Austria, Bavaria, Poland, Belgium, and Ireland; and by some provinces in Russia, Prussia, and Switzerland: the whole amounting to about 120 millions. To the Greek church belong the Russians and the Greeks; and a great number of the members of this church are dispersed over different parts of Turkey: they amount altogether to about 58 millions. The inhabitants of Sweden, Norway, and Denmark are almost exclusively Protestants; and the various sects of Protestants form the great majority in England, Scotland, Holland, Switzerland, Prussia, and the northern and western states of Germany. In France, Austria, Ireland, Belgium, and some provinces of Russia, Protestants are numerous. The whole number is about 56 millions. There are Armenians in Russia, Austria, and Turkey; about 200,000 in all. The Mohammedans, Turks, and Tartars are about six millions. Among the Laplanders and Samoyedes there are still some who have not embraced Christianity. The Calmucks and the Kirghises are mostly Bhuddists. At Astrakhan there are a few Hindoos. The Jews are most numerous in some parts of Russia, Poland, Austria, and Turkey. Their number cannot be accurately estimated. In the south-eastern countries of Europe there is a considerable number of Gypsies: it is doubtful what their religion is.

The following is a tabular view of the sovereign states of Europe. At the present time (August, 1848), most of the continental states are in commotion, and certain constitutional changes seem likely to occur. Until definite results are attained, it will be well to present the list as applicable to the beginning of the present year. Future changes, if any, will be noticed under the names of the respective countries. The population in most instances is only approximately stated from the latest available enumerations.

States.	Area. Sq. miles.	Population.
Andorra (Pyrenees)	190	15,300
Anhalt-Bernburg	330	47,000
Anhalt-Coethen	310	42,000
Anhalt-Dessau	357	63,000
Austria, Empire of,		
1, in Germany	237,834	31,890,000
2, in Italy	17,892	5,700,000
Baden	5,712	1,335,000
Bavaria	28,435	4,440,000
Belgium	12,569	4,270,000
Bremen	67	73,000
British Isles	116,700	27,200,000
Brunswick	1,525	268,000
Denmark	59,762	2,200,000
France	202,125	34,100,000
Frankfort	91	66,200
Greece	10,206	637,700
Hamburg	149	166,700
Hanover	14,600	1,756,000
Hesse-Cassel	4,386	732,000
Hesse-Darmstadt	3,198	835,000
Hesse-Homburg	154	24,400
Hohenzollern-Hechingen	136	20,100
Hohenzollern-Sigmaringen	383	45,100
Holland	13,890	3,159,000
Ionian Islands	998	242,000
Lichtenstein	52	6,350
Lippe-Detmold	432	104,500
Lübeck	142	46,700
Lucca	410	170,000
Marino, San	21	7,600
Mecklenburg-Schwerin	4,701	510,000
Mecklenburg-Strelitz	1,094	89,500
Modena and Massa	2,073	510,100
Monaco	50	6,700
Nassau	1,736	412,300
Oldenburg	2,470	276,300
Papal States	17,048	2,998,000
Parma	2,184	485,800
Portugal	34,500	3,743,000
Prussia	106,302	15,447,000
Reuss	588	103,700
Russia, (in Europe)	2,041,809	56,660,000
Sardinia	28,830	4,650,000
Saxony	5,705	1,757,800
Saxe-Altenburg	491	126,200
Saxe-Coburg and Gotha	790	144,000
Saxe-Meiningen	880	157,000
Saxe-Weimar-Eisenach	1,403	252,000
Schwarzburg	756	126,800
Schaumburg-Lippe	205	27,900
Sicilies, The Two	41,521	8,320,000
Spain	179,480	12,237,000
Sweden and Norway	284,530	4,306,000
Switzerland	17,208	2,177,500
Turkey, (in Europe)	183,140	12,000,000
Tuscany	8,302	1,532,000
Waldeck	455	58,800
Würtemberg	7,568	1,725,000
Total	3,708,381	250,391,000

Zoology of Europe.—The number of wild quadrupeds at present existing in Europe (many species having become extinct from the progress of civilization) is too small to exhibit many characteristic peculiarities; and the close connection of this continent with that of Asia makes it very difficult to draw any exact line between their productions. Many of the animals of the south of Europe are also common to the north of Africa; and most of the quadrupeds inhabiting the northern parts of our continent are found in the corresponding latitudes of Asia and America. But though the zoology of Europe does not possess much interest from the number, size, or peculiarity of its animals, this is in some measure compensated by the intimate acquaintance which we possess with the habits and manners of many of the smaller species, whose natural history has been

carefully investigated by many able and industrious naturalists.

Of the Horse, the lightest and fleetest breed was formerly that of Spain, which much resembled the Arabian: but it has now deteriorated. The heaviest horses are from the shores of the north sea; the smallest are from Corsica and from the north of Sweden; Holland and Switzerland produce good draught horses; France, hardy horses; while in England the various breeds have been brought to high perfection. [HORSE.] The Ass is not attended to so much in Europe as in Asia and Egypt: the finest are in Spain and Malta. [ASS.] The mule, a cross between the horse and the ass, is much reared in the mountainous parts of Spain. Of the Sheep, the chief European varieties are the Icelandic, the Cretan, the Wallachian, the Merino, and the several English breeds. [SHEEP]. The Goat is more fitted than the sheep to bear a severe climate, and is found in most of the mountainous districts of Europe. [GOAT.] The largest European breeds of Cattle are those of Podolia, the Ukraine, Turkey, Hungary, and the Papal States; there is a large breed in Denmark, whence have proceeded the Dutch, Holstein, and English varieties. [CATTLE; OX.] The Hog is much used for food by the peasantry of the Christian countries of Europe. In England there are many fine breeds, and some of them are fattened to a great size. Of the Dog, the chief European species are the Albanian, the French matin, the Irish greyhound, the great Danish dog, the common greyhound, the spaniel, the hound, the mastiff, &c. [DOG.] The cat is found in most European countries. [FELIS.] The reindeer is adapted only to cold climates: it is chiefly met with in Lapland. [DEER.]

The whole number of wild European mammalia at present met with is only 150, which includes 28 belonging to the whale tribe, and 8 species of phocidæ or seals, among which the morse or walrus (*Trichecus rosmarus*) is placed: these being deducted, the number of land animals is reduced to 114, a proportion very small when compared with the three other great continents. Of these seventy are also found out of Europe, most of them being common to Asia; there only remain therefore forty-four quadrupeds which are now peculiar to Europe. The only quadrumanous animal is the Barbary Ape.

Of the *Cheiroptera* twenty-seven species are found in Europe, most of which belong to the genus Vespertilio, a small and harmless race of bats. The most common and best known species is the *V. murinus*, the flitter-mouse of the English. Most of the *Carnivora* of Europe are very insignificant animals by the side of their congeners of Asia and Africa. The only formidable beasts of prey now found within the limits of our continent are the bear, the wolf, and the lynx; but it seems probable that the lion was once met with in the south of Europe. Of the genus Bear there are two species in Europe, the common brown bear (*Ursus arctos*), and the polar bear (*U. maritimus*). The wolf and fox, the latter under different varieties or species, appear generally distributed over Europe: the former is even now not uncommon among the wooded and mountainous districts of France. The common glutton or wolverine (*Gulo arcticus*) is a native of Denmark. Of small carnivorous quadrupeds there are several species.

Few of the *Rodentia* of Europe require particular notice. The beaver, the porcupine, the flying squirrel, the hamster and the marmot, are sparingly found in Europe: rats and mice are very abundant. Of the *Pachydermata*, the wild boar is the only original European specimen. The *Ruminantia* of Europe include eight species. Of these five are deer, all of which are also inhabitants of other continents, viz. the elk or moose-deer, the rein-deer, the fallow-deer, the red-deer, and the roebuck. The three remaining animals of this order are the ibex, the chamois, and the musmon. The *Cetacea* include many species of whale found near the European coasts.

The *Birds* of Europe are much more numerous than the mammalia. Above 400 species have been described as regular inhabitants of our continent, and a good many more are occasional visitants. In the northern or arctic regions very few birds are met with, and most of them belong to the wading and swimming orders; to whose nourishment and increase the arctic solitudes are particularly congenial. As we proceed to warmer latitudes, and vegetation acquires a more decisive character, the number and species of birds subsisting on the produce of the earth and on insects greatly increase. On the shores of the Mediterranean there is a union of the ornithology of Europe, Africa, and Asia: the pelican, the spoon-bill, and the flamingo are there met with, though not now very plentifully. Few of the birds of Europe are remarkable for that brilliancy of plumage which is so splendid a characteristic of the birds of tropical climates, but this is, in many instances, more than compensated by their sweetness of voice. The nightingale, the best songster in the world, is common in England and other European countries, though not confined to our continent.

The *Reptiles* of Europe are few, and generally harmless. The common viper is almost the only venomous serpent. There are numerous small lizards, one species of turtle, and the curious reptile named the *Proteus anguinus*.

Insects and other annulose animals are very numerous in Europe; they include, among the more troublesome varieties, the scorpion (in Sicily), the gnat, and the mosquito (in Sweden, in summer).

Many of the *Fish* which frequent the shores of Europe are very important in an economic point of view. We may particularly mention the herring, the salmon, the anchovy, and the tunny, whose capture and preparation employ a great number of men, and which are also important articles of diet.

Botany of Europe.—This continent, in its most southern limits, exhibits a strong resemblance to the vegetation of Africa and its adjacent islands. The vine, the date, the pisang, the prickly pear, the *Euphorbiaceæ*, the castor-oil plant, the American aloe, rice, the sugar-cane, the cotton-plant, the *Smilax aspera*, maize, Guinea corn, the fig, the olive, the orange—all are met with in different

parts of the south of Europe. At about the parallel of the south of France, a marked change occurs in vegetation: most of the southern equinoctial forms of vegetation either disappear or become uncommon. Still more to the north, where the vine begins to languish, its place is better occupied by broad plains of wheat and other corn; the hardy trees of England, elms, limes, oaks, ashes, alders, beeches, birches, willows, and poplars, are found everywhere, with rich pastures and verdant fields, unknown in the land of oranges and myrtles. At last, in the more northern districts of the continent, aspens (*Populus tremula*), bird-cherries (*Prunus Padus*), birches, lime-trees, alders, junipers, spruce-firs, and pines, are the principal trees that remain; barley and oats are the only corn-plants, but potatoes continue to be reared in the short cold summer.

These changes take place if we merely look to the districts of the plains. In Europe, as in other parts of the world, similar alterations in vegetation occur as we ascend into the atmosphere. In Sicily, for instance, with an almost tropical vegetation in the valleys, there is a transition to the middle forms of European vegetation midway on the mountain-side, and then to the most northern flora at its summit, 9000 feet above the sea [ETNA]; and so with other mountains as we advance to the south, till at last, on Sulitelma, in Lapland, not a trace of vegetation can be discovered above the height of 3640 feet.

EU'RYALE, a genus of plants belonging to the natural order *Nymphæaceæ*. There is but one species of this genus, *E. ferox*, which is an elegant aquatic covered all over with prickles, with large peltate orbicular leaves, and bluish purple or violet flowers, about the size of those of the yellow water-lily. It is a native of lakes in the East Indies and in China. The leaves are about a foot in diameter. The root or rootstock contains starch, which may be separated as food, or the root may be eaten, as is done by the inhabitants of the districts where it grows.

EURY'NOME, a genus of brachyurous crustaceans, established by Dr. Leach, and forming the second genus of the Parthenopians of M. Milne Edwards. Example, *Eurynome aspera*. Locality, the coasts of Noirmoutiers and the Channel, at rather considerable depths. [PARTHENOPE.]

EURYNO'TUS, a genus of fossil Ganoid fishes, from the limestone of Burdie House and the shales of Newhaven. (Agassiz.)

EURYO'CRINUS, a genus of fossil Crinoiden, from the mountain limestone. (Phillips.)

EURY'PTERUS (Harlan), a singular genus of fossil Crustacea, from North America and Scotland. *E. Scouleri* occurs in carboniferous limestone at Kirkton, near Glasgow.

EUSE'BIUS PA'MPHILI, bishop of Cæsarea, in Palestine, and the friend of Constantine, was born in Palestine towards the end of the reign of Gallienus, about A.D. 264. He became intimate with Pamphilus, bishop of Cæsarea, who suffered martyrdom under Galerius A.D. 309, and in memory of whose friendship he added to his name that of Pamphili. In 313 he was himself raised to the see of Cæsarea, which he filled until his death. He attended the great council of Nicæa, A.D. 325, where he joined his brethren in condemning the tenets of Arius. At the council of Tyre, A.D. 335, Eusebius joined in condemning and deposing Athanasius on the charges of disobedience to the emperor in not reinstating Arius, want of respect to the council, and an alleged desecration of some sacred vessels. Eusebius was deputed by the council to defend before Constantine the judgment which they had passed against Athanasius. The part which he took in this controversy caused him to be stigmatised as an Arian, though it appears that he fully admitted the divinity of Christ; and all that his accusers can prove is, that he believed that there was a certain subordination among the persons of the Trinity. Eusebius of Cæsarea died A.D. 340.

The principal works of Eusebius are—1. 'The Ecclesiastical History,' in ten books, from the advent of our Saviour to the defeat of Licinius by Constantine, A.D. 324. 2. 'De Præparatione Evangelicâ,' in fifteen books. In this work he examines the various systems of theosophy and cosmogony of the ancient philosophers, the purest part of which, he maintains, was borrowed from the Jewish sacred writings. 3. 'De Demonstratione Evangelicâ,' in twenty books, of which only ten have come down to us. It consists of further proofs of the truth of the Christian faith, chiefly directed against the Jews, being drawn from the books of the Old Testament. 4. The 'Chronicle or Universal History,' was only known by fragments until it was lately discovered entire in an Armenian MS. version, found at Constantinople, and published by Zohrab and Mai at Milan in 1818. The work is divided into two books; the first, entitled 'Chronography,' contains brief separate sketches of the history of the various nations and states of the old world, from the Creation till the year 325 of our æra. The discovery of the Armenian copy of Eusebius has been a valuable acquisition, as it serves to correct several errors and to supply many deficiencies in chronology and ancient history. The other works of Eusebius are—5. 'Onomasticon Urbium et Locorum Sacræ Scripturæ. 6. 'The Life of Constantine,' in four books, a piece of panegyrical biography. 7. A Life of his friend Pamphilus, of which only a fragment remains; and other minor works.

EUSE'BIUS, bishop of Emesa in Phœnicia, was born in the neighbourhood of Edessa, and belonged to a very illustrious family. He died at Antioch in A.D. 360. Eusebius was a great favourite of the emperor Constantius. Hieronymus calls him the ringleader of the Arian party; but so far as we know, all that can be said is, that Eusebius had a leaning towards the views of the semi-Arians. The works of Eusebius are lost, with the exception of a few said to exist in MS.; and the fifty homilies, attributed to him, are not his. (Cave, *Historia Literaria*, vol. i. p. 156, &c.; Fabricius, *Biblioth. Græc.*, vii. p. 412, &c.)

EUSTACHIAN TUBE. [EAR.]

EUSTACHIUS. *Bartolomeo Eustachio*, or *Eustachius*, was one of the distinguished band of Italian professors to whom we owe the restoration

of anatomy and much of its advancement in modern times. He was born in the early part of the sixteenth century at San Severino, in the marquisate of Ancona. Having accomplished himself in the classical and Arabic languages, he studied medicine at Rome, and afterwards settled there with a view to practise as a physician, under the patronage of cardinal Borromeo. The interest he could thus command and his unusual talents were sufficient to elevate him to the chair of medicine in the Collegio della Sapienza; yet he never obtained any degree of professional success, and after a long struggle with poverty and sickness, he died in great indigence about 1574.

Eustachius published little in his lifetime, though he lived long and laboured much; yet his treatises, short and few as they are, and composed when anatomy was yet an infant science, are of high authority even at the present day, and bear witness to the accuracy and extent of his researches. They are all in Latin, and are nearly all collected in his 'Opuscula Anatomica,' published in 4to. at Venice in 1564, by himself, and again by Boerhaave, Leyden, 1707, in 8vo. He also published an edition, with annotations, of Erotian's 'Lexicon Hippocraticum.'

Haller declares it to be impossible without writing a treatise on the subject to particularise the discoveries and corrections that Eustachius introduced into anatomy. The tube leading from the ear-drum to the throat, and a certain valvular membrane in the heart, which bear his name, are among his discoveries.

EUSTA'THIUS, archbishop of Thessalonica in the latter part of the 12th century, wrote a Commentary upon the 'Iliad' and the 'Odyssey,' which contains extracts from the older commentators, such as Apion, Heliodorus, Demosthenes of Thrace, Porphyrius, and others. The latest edition is that of Leipzig, 1827. Eustathius wrote likewise a Commentary on Dionysius Periegetes, or the Geographer, which was printed by R. Estienne, 1547, and has been often reprinted since.

EUSTA'TIUS, or EUSTATIA, ST., in 17° 33' N. lat., and 63° 3' W. long., one of the Leeward Islands in the West Indies, is a smally rocky island, about 25 miles in circumference, rising from the sea in the form of a truncated pyramid or sugar loaf, terminating in a plain surrounded with woods, having a hollow in the centre, which is now a vast den for numerous wild beasts, and is perhaps the crater of an extinct volcano. The climate is in general healthy, but the island is frequently visited by dreadful thunder-storms and hurricanes. The extraordinary fertility of the soil, aided by the industry of the Dutch, who have cultivated the island to the very summit, have rendered it one of the most flourishing and wealthy of all the Caribbee Islands. The principal article of cultivation is tobacco, but the planters grow likewise sugar, indigo, and cotton. The island has great abundance of hogs, goats, rabbits, and poultry of all kinds, not only for the consumption of the inhabitants themselves, but for the supply of the neighbouring colonies, with which they are said to carry on a profitable contraband trade, the situation of the island being remarkably convenient for that purpose. The only landing-place, naturally difficult of access, is further guarded by a fort, nor has any thing been neglected in the fortifying of every part of the island.

EUTO'CIUS, a Greek mathematician of Ascalon, in Palestine, who flourished about A.D. 550. He was pupil of Isidorus, the architect who designed and chiefly built the celebrated church (now the mosque) of St. Sophia in Constantinople; and he became ultimately one of the most distinguished geometricans of his time.

The Commentaries of Eutocius on the works of Archimedes and Apollonius are the only works by which he is known to modern readers.

EUTRO'PIUS, FLAVIUS, was a Latin historian of the fourth century. He was secretary to the emperors Constantine and Julian, and accompanied the latter in his unfortunate Parthian campaign. He is the author of a compendium of Roman history, in ten books, from the foundation of the city to the accession of Valens, A.D. 365, which, being short and easy, has been much used as a school-book. Meagre as it is—for it might be contained in 100 common-sized octavo pages—it is still of some use towards filling up those gaps in history which are left in consequence of the total loss of some writers and the imperfect condition in which others have come down to us. The best edition is by Verkeyk, Leyden, 1793, 8vo.

EUTYCHIANS, a sect of Christians which began in the East in the 5th century. Eutyches, its reputed founder, though the opinions attributed to him are said to have existed before ('De Eutychianismo ante Eutychen,' by Christ. Aug. Selig; and also Assemani, 'Bibliotheca Orientalis,' tom. i. p. 219), was a monk who lived near Constantinople, and had a great reputation for austerity and sanctity. He was already advanced in years when he came out of his retirement, A.D. 448, in order to oppose the Nestorians, who were accused of teaching 'that the divine nature was not incarnate in, but only attendant on, Jesus, being superadded to his human nature after the latter was formed.' In his zeal for opposing the error ascribed to the Nestorians, Eutyches ran into the opposite extreme of saying that in Christ there was 'only one nature, that of the incarnate Word,' his human nature having been absorbed in a manner by his divine nature. The doctrine of Eutyches was condemned by a council at Constantinople, and this decision was reversed by another council at Ephesus in 449; but at length by the council at Chalcedon, A.D. 451, which is reckoned as the fourth œcumenical council of the church, Eutyches was again condemned, and deprived of his sacerdotal office. Eutyches died in exile; but several monks, especially in Syria, continued the schism, under the general name of Monophysites, or believers in one nature. In the 6th century a fresh impulse was given to the Eutychian doctrine by one Jacob, a monk surnamed Baradæus, who himself died bishop of Edessa, A.D. 588. He was considered as the second founder of the Monophysites, who assumed from him the name of Jacobites, under which appellation they still constitute a very numerous

church. The Armenians and the Copts are Jacobites, and so are likewise many Syrian Christians, in contradistinction to the Melchites, who belong to the Greek church.

The Monothelites, who appeared in the 7th century, have been considered as an offshoot of the Eutychians, or Monophysites, though they pretended to be quite unconnected with them. They admitted the two natures in Christ, explaining that after the union of the two in one person, there was in him only one will and one operation. This was an attempt to conciliate the Monophysites with the orthodox church, and it succeeded for a time. The council of Constantinople, which is the sixth œcumenical council, A.D. 680, condemned the Monothelites.

(Mosheim's *Ecclesiastical History.*)

EUXINE. [BLACK SEA.]

EVA'GORAS, king of Salamis, in the island of Cyprus, from B.C. 410 to 374. His family had been deprived of the government of Salamis by a Phœnician, Abdymon, who placed his usurped kingdom under the protection of Persia. During the reign of the usurper Evagoras spent his boyhood at Salamis; but when the usurper had been murdered by one of the Cyprian nobles, Evagoras fled to Soli in Cilicia, for the murderer, to secure the throne to himself, was anxious to get rid of Evagoras also. Accompanied by fifty faithful friends, Evagoras made a descent upon Cyprus, defeated his enemies, and recovered his kingdom, B.C. 410. Isocrates, to whom we are chiefly indebted for our knowledge of Evagoras, says, that he restored the fortifications and the harbour of Salamis, built ships, and endeavoured to establish commerce; but his great ambition was to introduce Greek manners and literature into his kingdom. Hence many a Greek exile, especially Athenian, found a welcome reception there; and Conon, after the battle of Ægospótami, in B.C. 405, was hospitably received by Evagoras. Through the mediation of Ctesias, the physician of Cnidus, a treaty was concluded between king Artaxerxes II. and Evagoras; but the friendly relation with Persia did not last long, for Evagoras had enlarged his kingdom, partly by persuading the towns of Cyprus, and partly by force. Several towns solicited the protection of Artaxerxes, who sent Hecatomnus, a dynast of Caria, with the command of the Persian fleet, and Autophradates with that of the army, B.C. 391. Evagoras was supported by the Athenians with ships; but his small fleet was captured by the Spartan Teleutias. Notwithstanding this misfortune the Persians made no progress; and in the meantime Evagoras concluded an alliance with King Acoris of Egypt, and in B.C. 388 he received from the Athenians a fleet under the command of Chabrias. Evagoras now in a short time made himself master of nearly all Cyprus, ravaged Phœnicia, and induced Cilicia to revolt against Persia. Artaxerxes in alarm concluded a peace with the Spartan Antalcidas, B.C. 370, in which Cyprus was recognised as a province of the Persian empire. The Athenians accordingly recalled Chabrias and his fleet, but Evagoras still refused to submit to Persia. The Persians landed an army in Cyprus, but Evagoras cut off their supplies, which caused an insurrection in the Persian camp; and Evagoras having increased his fleet, ventured upon a sea-fight, but he was defeated, and lost many of his ships. Salamis was now blockaded by the Persians by land and by sea, and Evagoras leaving the command at Salamis in the hands of his son Phytágoras, went to Egypt to ask aid of Acoris, but without success. Upon this he entered into negociations with Tiribazus, the commander of the Persian fleet, who demanded all the towns in Cyprus, and an annual tribute for the little kingdom of Salamis. The negotiations were broken off, and after a short interruption war was resumed. The war with Persia, which lasted for ten years, from B.C. 385 to 376, was brought to a close very honourable to Evagoras. In B.C. 374, being then at an advanced age, he was murdered by a eunuch. He had been married to Leto, by whom he was the father of a large family. He was succeeded by his son Nicocles. (Isocrates, *Evagoras;* Diodorus, xiv. 39, 98, 110; xv. 2-9, 47; 176; Xenophon, *Hellen.* iv. 8, 24.)

From this Evagoras we must distinguish another, who was likewise king of Salamis, and, so far as chronology is concerned, may have been either a son or grandson of the first Evagoras. (Diodorus, xvi. 42, 46.)

EVA'GRIUS, born at Epiphanía, in Syria, about A.D. 536, practised as an advocate at Antioch, where he acquired a brilliant reputation. He was afterwards appointed quæstor, and filled other public offices. He wrote an ecclesiastical history in six books, beginning with A.D. 431, about the period where the histories of Sócrates and Theodorétus terminate, and continuing to the year 593. Evagrius was well acquainted with profane and ecclesiastical history. His work was published by Robert Estienne, and afterwards by Valois, Paris, 1679, in an improved edition founded upon two different MSS. It was published again with notes at Cambridge, 1720.

EVALD, JOHANNES, a distinguished Danish poet, was born at Copenhagen, November 18th, 1743. His father, who died in 1754, was a clergyman in that city. Johannes was sent to be educated at Slesvig, where, when only 13 years of age, excited by the reading of Robinson Crusoe, he ran away from school in order to go to sea. His plan was frustrated, but though of a weak and delicate frame he had still a love for adventures, and enlisted as a soldier, first in the Prussian service, and afterwards in that of Austria. He served in Bohemia, and was at Dresden when that town was besieged by the Prussians. On his return to Denmark he applied himself to the study of theology, with the view of settling in that profession and marrying, but his hopes of the latter were disappointed, as the lady gave her hand to another. Under the influence of this disappointment he produced his 'Lykken's Temple' (The Temple of Fortune), a vision, which at once stamped his reputation. This was succeeded by his 'Adam and Eve,' a dramatic composition replete with poetical energy, yet in may respects defective and anomalous. Having made himself master of the English language, he read Shakspere, and Ossian, and when he again took up his pen, he composed

his 'Rolf Krage,' a tragedy strongly tinctured with Ossianic taste. It was first given to the public in 1770; about which time he was attacked with a painful disorder in his limbs, that continued to afflict him with little intermission during the rest of his life. Notwithstanding his severe sufferings, he not only pursued his literary occupations, but wrote his comedy of 'Harlequin Patriot,' a masterpiece of its kind, abounding with pleasantry and satire chiefly directed against pseudo-reformers. In the following year, 1773, he executed his literary chef-d'œuvre, 'Balders Död,' a drama of extraordinary poetical beauty. Evald produced also several things in prose, some of which—as his 'Forsig om Pebersvende' (Project respecting Old Bachelors)—are replete with shrewd satire and strong comic humour, notwithstanding they were written when he had to contend both with ill health and distressed circumstances. In his last years he met with a kind and sympathising friend in Madame Skou, beneath whose roof he died March 17, 1781.

EVANGELIST is the Greek appellation *Euangelistes* (εὐαγγελιστής from εὖ and ἄγγελος), which signifies a messenger of any good news. In the first ages of Christianity it was a general name of all those who, either by preaching or writing, announced the 'glad tidings' of the Christian revelation. The use of the term is now confined to the four writers to whom the canonical gospels are attributed, Matthew, Mark, Luke, and John.

EVAPORATION is the transformation of a liquid into a gaseous state by the action of heat.

If any liquid be placed in an open vessel, it gradually diminishes in quantity by evaporation, and at length disappears. The quantity of vapour produced in a given time is proportional to the area of the exposed surface; but, with equal temperatures, the escape of vapour from different liquids varies in rapidity. Over the surface of an ocean the aqueous vapour held in the atmosphere amounts to an enormous quantity.

The quantity of vapour which rises from a liquid depends mainly upon the temperature; but it is influenced by the state of the atmosphere with respect to dryness or moisture, a dry and warm atmosphere being most favourable to it. At equal temperatures, in a close vessel, the evaporation is the same in quantity whether the vessel containing the liquid contain also air, or have the air exhausted from it, but more rapid in the latter case.

It was found by Dalton, that at 212° Fahr., the evaporation of water from one square inch of surface is equal to 4.244 grains per minute; and at 138 Fahr., one grain per minute. Dalton and Gay Lussac have found that the evaporation from ice is equal to that from water at the same temperature. Dalton also determined that the quantity of vapour raised from a given surface of any liquid, at a given temperature, is directly proportional to the elastic force of the vapour at that temperature.

Solid substances and liquids of great specific gravity have vapours of small elastic force. When, by evaporation, a liquid is transformed into a vapour, heat is abstracted from the liquid, and a thermometer in it indicates a depression of temperature. The cooling effect of evaporation is noticed under FREEZING APPARATUS.

EVAUX. [CREUSE.]

EVELYN, JOHN, author of 'Sylva,' 'Memoirs,' &c., was the second son of Richard Evelyn, Esq., of Wotton, in Surrey, and was born at that place, October 31, 1620. He received his education at Lewes free school and Balliol College, Oxford. In 1641 he went abroad; he served for a short time as volunteer in Flanders, and, with only two short intervals, remained abroad till 1652. In 1647 he married the daughter of Sir Richard Browne, and on his return he lived in retirement on her property of Sayes Court till the Restoration. His character then occasioned him to be drawn from his privacy, and to be frequently engaged in the public service. Among other things he was a commissioner to take care of the sick and wounded, on the Dutch war breaking out in 1664, commissioner for the rebuilding of St. Paul's, a member of the Board of Trade on its first institution, &c. He was also one of the first members of the Royal Society, and continued through life a diligent contributor to its 'Transactions.' His most favourite pursuits were horticulture and planting, upon which he wrote a variety of treatises, which are collected at the end of the fifth edition (1729) of his 'Sylva, or a Discourse on Forest-Trees and the Propagation of Timber in his Majesty's Dominions,' first published in 1664.

Mr. Evelyn's works on the fine arts are: 'Sculptura,' 1662, a history of the art of engraving, in which the first account is given of Prince Rupert's supposed new method of mezzotinto: 'A Parallel of Ancient and Modern Architecture,' 1669; 'Numismata, a Discourse upon Medals,' 1697. All these, though long superseded, were much esteemed, and were in fact valuable additions to the then existing stock of literature.

By the death of his brother, in October, 1699, Mr. Evelyn succeeded to the family estate at Wotton, where he died Feb. 27, 1706. To the present age he is best known by his 'Memoirs,' a journal extending nearly from his childhood to his death, which contains much curious matter relative to his travels, and to the manners and history, political and scientific, of the age. The work was first printed in 1818.

END OF VOL. V.