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THE ENCYCLOPÆDIA BRITANNICA

A DICTIONARY OF ARTS, SCIENCES, LITERATURE AND GENERAL INFORMATION

ELEVENTH EDITION

VOLUME V SLICE IV

Carnegie to Casus Belli

Articles in This Slice

CARNEGIE, ANDREW (1837-), American "captain of industry" and benefactor, was born in humble circumstances in Dunfermline, Scotland, on the 25th of November 1837. In 1848 his father, who had been a Chartist, emigrated to America, settling in Allegheny City, Pennsylvania. The raw Scots lad started work at an early age as a bobbin-boy in a cotton factory, and a few years later was engaged as a telegraph clerk and operator. His capacity was perceived by Mr T.A. Scott of the Pennsylvania railway, who employed him as a secretary; and in 1859, when Scott became vice-president of the company, he made Carnegie superintendent of the western division of the line. In this post he was responsible for several improvements in the service; and when the Civil War opened he accompanied Scott, then assistant secretary of war, to the front. The first sources of the enormous wealth he subsequently attained were his introduction of sleeping-cars for railways, and his purchase (1864) of Storey Farm on Oil Creek, where a large profit was secured from the oil-wells. But this was only a preliminary to the success attending his development of the iron and steel industries at Pittsburg. Foreseeing the extent to which the demand would grow in America for iron and steel, he started the Keystone Bridge works, built the Edgar Thomson steel-rail mill, bought out the rival Homestead steel works, and by 1888 had under his control an extensive plant served by tributary coal and iron fields, a railway 425 m. long, and a line of lake steamships. As years went by, the various Carnegie companies represented in this industry prospered to such an extent that in 1901, when they were incorporated in the United States Steel Corporation, a trust organized by Mr J. Pierpont Morgan, and Mr Carnegie himself retired from business, he was bought out at a figure equivalent to a capital of approximately £100,000,000.

From this time forward public attention was turned from the shrewd business capacity which had enabled him to accumulate such a fortune to the public-spirited way in which he devoted himself to utilizing it on philanthropic objects. His views on social subjects, and the responsibilities which great wealth involved, were already known in a book entitled *Triumphant Democracy,* published in 1886, and in his *Gospel of Wealth* (1900). He acquired Skibo Castle, in Sutherlandshire, Scotland, and made his home partly there and partly in New York; and he devoted his life to the work of providing the capital for purposes of public interest, and social and educational advancement. Among these the provision of public libraries in the United States and United Kingdom (and similarly in other English-speaking countries) was especially prominent, and "Carnegie libraries" gradually sprang up on all sides, his method being to build and equip, but only on condition that the local authority provided site and maintenance, and thus to secure local interest and responsibility. By the end of 1908 he had distributed over £10,000,000 for founding libraries alone. He gave £2,000,000 in 1901 to start the Carnegie Institute at Pittsburg, and the same amount (1902) to found the Carnegie Institution at Washington, and in both of these, and other, cases he added later to the original endowment. In Scotland he gave £2,000,000 in 1901 to establish a trust for providing funds for assisting education at the Scottish universities, a benefaction which resulted in his being elected lord rector of St Andrews University. He was a large benefactor of the Tuskegee Institute under Booker Washington for negro education. He also established large pension funds—in 1901 for his former employés at Homestead, and in 1905 for American college professors. His benefactions in the shape of buildings and endowments for education and research are too numerous for detailed enumeration, and are noted in this work under the headings of the various localities. But mention must also be made of his founding of Carnegie Hero Fund commissions, in America (1904) and in the United Kingdom

(1908), for the recognition of deeds of heroism; his contribution of £500,000 in 1903 for the erection of a Temple of Peace at The Hague, and of £150,000 for a Pan-American Palace in Washington as a home for the International Bureau of American republics. In all his ideas he was dominated by an intense belief in the future and influence of the English-speaking people, in their democratic government and alliance for the purpose of peace and the abolition of war, and in the progress of education on unsectarian lines. He was a powerful supporter of the movement for spelling reform, as a means of promoting the spread of the English language. Mr Carnegie married in 1887 and had one daughter. Among other publications by him were *An American Four-in-hand in Britain* (1883), *Round the World* (1884), *The Empire of Business* (1902), a *Life of James Watt* (1905) and *Problems of To-day* (1908).

CARNEGIE, a borough of Allegheny county, Pennsylvania, U.S.A., 6 m. S.W. of Pittsburg. Pop. (1900) 7330 (1816 being foreign-born); (1910) 10,009. It is served by the Pittsburg, Cincinnati, Chicago & St Louis, the Pittsburg, Chartiers & Youghiogheny, and the Wabash Pittsburg Terminal railways, and the Pittsburg street railway. Carnegie is situated in the beautiful valley of Chartiers Creek, and is in one of the coal and natural gas districts of the state. In the borough are a Carnegie library and St Paul's orphan asylum. Among the borough's manufactures are steel, lead, glass, ploughs and enamel- and tin-ware. There are alkaline and lithia mineral springs here. In 1894 Carnegie, named in honour of Andrew Carnegie, was formed by the union of the boroughs Chartiers and Mansfield.

CARNELIAN, a red variety of chalcedony, much used as an ornamental stone, especially for seals. The old name was cornelian, said to have been given in reference either to the horny appearance of the stone (Lat. *cornu*, "horn") or to its resemblance in colour to the berry of the cornel; but the original word was corrupted to carnelian, probably in allusion to its reddish colour (*carneus*, "flesh-coloured"). Some carnelian, however, is brown, yellow or even white. Certain kinds of brown and bright red chalcedony, much resembling carnelian, pass under the name of sard (*q.v.*). The Hebrew *odem* was probably a red stone, either carnelian, sard or jasper. All carnelian is translucent and is thus distinguished from jasper of similar colour, which is always opaque. The red colour of typical carnelian is due to the presence of ferric oxide. This is often developed artificially by exposure to sunshine, or to artificial heat, whereby any ferric hydrate in the stone becomes more or less dehydrated; or the stone is treated with a solution of an iron salt, like ferrous sulphate, and then heated, when ferric oxide is formed in the pores of the stone. An opaque white surface is sometimes produced artificially on a red carnelian: this is said to be done by coating the stone with carbonate of soda and then placing it on a red-hot iron; or by using a mixture of potash, white lead and certain vegetable juices, and heating it on charcoal. Inscriptions and figures in white on red carnelian ("burnt carnelian") are well known from the East. Much carnelian comes from India, being mostly derived from agate-gravels, resulting from the disintegration of the Deccan traps, in the neighbourhood of Ratanpur, near Broach. A good deal of the carnelian now sold, however, is Brazilian agate, artificially stained. (See AGATE.)

CARNESECCHI, PIETRO (1508-1567), Italian humanist, was the son of a Florentine merchant, who under the patronage of the Medici, and especially of Giovanni de' Medici as Pope Clement VII., rapidly rose to high office at the papal court. He came into touch with the new learning at the house of his maternal uncle, Cardinal Bernardo Dovizzi, in Rome. At the age of twenty-five he held several rich livings, had been notary and protonotary to the Curia, and was first secretary to the pope, in which capacity he conducted the correspondence with the nuncios (among them Pier Paolo Bergerio in Germany) and a host of other duties. By his

conduct at the conference with Francis I. at Marseilles he won the favour of Catherine de' Medici and other influential personages at the French court, who in later days befriended him. He made the acquaintance of the Spanish reformer Juan de Valdes at Rome, and got to know him as a theologian at Naples, being especially drawn to him through the appreciation expressed by Bernardino Ochino, and through their mutual friendship with the Lady Julia Gonzaga, whose spiritual adviser he became after the death of Valdes. He became a leading spirit in the literary and religious circle that gathered round Valdes in Naples, and that aimed at effecting from within the spiritual reformation of the church. Under Valdes' influence he whole-heartedly accepted Luther's doctrine of justification by faith, though he repudiated a policy of schism. When the movement of suppression began, Carnesecchi was implicated. For a time he found shelter with his friends in Paris, and from 1552 he was in Venice leading the party of reform in that city. In 1557 he was cited (for the second time) before the tribunal in Rome, but refused to appear. The death of Paul IV. and the accession of Pius IV. in 1559 made his position easier, and he came to live in Rome. With the accession of Pius V. (Michael Ghislieri) in 1565 the Inquisition renewed its activities with fiercer zeal than ever. Carnesecchi was in Venice when the news reached him, and betook himself to Florence, where, thinking himself safe, he was betrayed by Cosimo, the duke, who wished to curry favour with the pope. From July 1566 he lay in prison over a year. On the 21st of September 1567 sentence of degradation and death was passed on him and sixteen others, ambassadors from Florence vainly kneeling to the pope for some mitigation, and on the 1st of October he was publicly beheaded and then burned.

CARNIOLA (Ger. *Krain*), a duchy and crown-land of Austria, bounded N. by Carinthia, N.E. by Styria, S.E. and S. by Croatia, and W. by Görz and Gradisca, Trieste and Istria. It has an area of 3856 sq. m. Carniola is for the most part a mountainous region, occupied in the N. by the Alps, and in the S. by the Karst (*q.v.*) or Carso Mountains. It is traversed by the Julian Alps, the Karawankas and the Steiner Alps, which belong all to the southern zone of the Eastern Alps. The highest point in the Julian Alps is formed by the three sugar-loaf peaks of the Triglav or Terglou (9394 ft.), which offers one of the finest views in the whole of the Alps, and which bears on its northern declivity the only glacier in the province. The Triglav is the dividing range between the Alps and the Karst Mountains, and its huge mass also forms the barrier between three races: the German, the Slavonic and the Italian. Other high peaks are the Mangart (8784 ft.) and the Jaluz (8708 ft.). The Karawankas, which form the boundary between Carinthia and Carniola, have as their highest peak the Stou or Stuhlberg (7344 ft.), and are traversed by the Loibl Pass (4492 ft.). They are continued by the Steiner or Santhaler Alps, which have as their highest peak the Grintouz or Grintovc (8393 ft.). This peak is situated on the threefold boundary of Carinthia, Carniola and Styria, and affords a magnificent view of the whole Alpine neighbouring region. The southern part of Carniola is occupied by the following divisions of the northern ramifications of the Karst Mountains: the Birnbaumer Wald with the highest peak, the Nanos (4275 ft.), and the Krainer Schneeberg (5890 ft.); the Hornwald with the highest peak, the Hornbüchl (3608 ft.), and the Uskokengebirge (3874 ft.). The portion of Carniola belonging to the Karst region presents a great number of caves, subterranean streams, funnels and similar phenomena. Amongst the best-known are the grottos of Adelsberg, the larger ones of Planina and the Kreuzberghöhle near Laas.

With the exception of the Idria and the Wippach, which as tributaries of the Isonzo belong to the basin of the Adriatic, Carniola belongs to the watershed of the Save. The Save or Sau rises within the duchy, and is formed by the junction at Radmannsdorf of its two head-streams the Wurzener Save and the Wocheiner Save. Its principal affluents are the Kanker and the Steiner Feistritz on the left, and the Zeyer or Sora, the Laibach and the Gurk on the right. The most remarkable of these rivers is the Laibach, which rises in the Karst region under the name of Poik, takes afterwards a subterranean course and traverses the Adelsberg grotto, and appears again on the surface near Planina under the name of Unz. Shortly after this it takes for the second time a subterranean course, to appear finally on the surface near Oberlaibach. The small torrent of Rothwein, which flows into the Wurzener Save, forms near Veldes the splendid series of cascades known as the Rothwein Fall. Amongst the principal lakes are the Wochein, the Weissenfels, the Veldes, and the seven small lakes of the Triglav; while in the Karst region lies the famous periodical lake of Zirknitz, known to the Romans as *Lacus Lugens* or *Lugea Palus.*

The climate is rather severe, and the southern part is exposed to the cold north-eastern wind, known as the Bora. The mean annual temperature at Laibach is 48.4° F., and the rainfall amounts to 72 ins. Of the total area only 14.8% is under cultivation, and the crops do not suffice for the needs of the province; forests occupy 44.4%, 17.2% are meadows, 15.7% are pastures, and 1.17% of the soil is covered by vineyards. Large quantities of flax are grown, while the timber trade is of considerable importance. Fish and game are plentiful, and the silkworm is bred in the warmer districts. The principal mining product is mercury, extracted at Idria, while iron and copper ore, zinc and coal are also found. The industry is not well developed, but the weaving of linen and lace is pursued as a household industry.

Carniola had in 1900 a population of 508,348, which corresponds to 132 inhabitants per sq. m. Nearly 95% were Slovenes and 5% Germans, while 99% of the population belonged to the Roman Catholic Church. The local diet, of which the bishop of Laibach is a member *ex officio,* is composed of thirty-seven members, and Carniola sends eleven deputies to the Reichsrat at Vienna. For administrative purposes the province is divided into eleven districts and one autonomous municipality, Laibach (pop. 36,547), the capital. Other important places are Oberlaibach (5882), Idria (5772), Gurkfeld (5294), Zirknitz (5266), Adelsberg (3636), Neumarktl (2626), Krainburg (2484) and Gottschee (2421).

Carniola derives its modern name from the Slavonic word *Krajina* (frontier). During the Roman Empire it formed part of Noricum and Pannonia. The Slavonic population settled here during the end of the 6th and the beginning of the 7th century. Conquered by Charlemagne, the most of the district was bestowed on the duke of Friuli; but in the 10th century the title of margrave of Carniola began to be borne by a family resident in the castle of Kieselberg near Krainburg. Various parts of the present territory were, however, held by other lords, such as the duke of Carinthia and the bishop of Freising. Towards the close of the 14th century all the separate portions had come by inheritance or bequest into the hands of Rudolph IV. of Austria, who took the title of duke of Carniola; and since then the duchy has remained a part of the Austrian possessions, except during the short period from 1809 to 1813, when it was incorporated with the French Illyrian Provinces. In 1849 it became a separate crown-land.

See Dimitz, *Geschichte Krains von der ältesten Zeit his 1813* (4 vols., Laibach, 1874-1876).

CARNIVAL (Med. Lat. *carnelevarium*, from *caro, carnis,* flesh, and *levare*, to lighten or put aside; the derivation from *valere*, to say farewell, is unsupported), the last three days preceding Lent, which in Roman Catholic countries are given up to feasting and merry-making. Anciently the carnival was held to begin on twelfth night (6th January) and last till midnight of Shrove Tuesday. There is little doubt that this period of licence represents a compromise which the church always inclined to make with the pagan festivals and that the carnival really represents the Roman Saturnalia. Rome has ever been the headquarters of carnival, and though some popes, notably Clement IX. and XI. and Benedict XIII., made efforts to stem the tide of Bacchanalian revelry, many of the popes were great patrons and promoters of carnival keeping. Paul II. was notable in this respect. In his time the Jews of Rome were compelled to pay yearly a sum of 1130 golden florins (the thirty being added as a special memorial of Judas and the thirty pieces of silver), which was expended on the carnival. A decree of Paul II., minutely providing for the diversions, orders that four rings of silver gilt should be provided, two in the Piazza Navona and two at the Monte Testaccio—one at each place for the burghers and the other for the retainers of the nobles to practise riding at the ring. The pope also orders a great variety of races, the expenses of which are to be paid from the papal exchequer—one to be run by the Jews, another for Christian children, another for Christian young men, another for sexagenarians, a fifth for asses, and a sixth for buffaloes. Under Julius III. we have long accounts of bull-hunts—or rather bull-baits—in the Forum, with gorgeous descriptions of the magnificence of the dresses, and enormous suppers in the palace of the Conservatori in the capitol, where seven cardinals, together with the duke Orazio Farnese, supped at one table, and all the ladies by themselves at another. After the supper the whole party went into the courtyard of the palace, which was turned into the semblance of a theatre, “to see a most charming comedy which was admirably played, and lasted so long that it was not over till ten o’clock!” Even the austere and rigid Paul IV. (*ob.* 1559) used to keep carnival by inviting all the Sacred College to dine with him. Sixtus V., who was elected in 1585, set himself to the keeping of carnival after a different fashion. Determined to repress the lawlessness and crime incident to the period, he set up gibbets in

conspicuous places, as well as whipping-posts, the former as a hint to robbers and cut-throats, the latter in store for minor offenders. We find, further, from the provisions made at the time, that Sixtus reformed the evil custom of throwing dirt and dust and flour at passengers, permitting only flowers or sweetmeats to be thrown.

The later popes for the most part restricted the public festivities of the carnival to the last six or seven days immediately preceding Ash Wednesday. The municipal authorities of the city, on whom the regulation of such matters now depends, allow ten days. The carnival sports at Rome anciently consisted of three divisions: (1) the races in the Corso (formerly called the Via Lata, and taking its present name from them), which appear to have been from time immemorial a part of the festivity; (2) the spectacular pageant of the Agona; (3) that of the Testaccio.

Of other Italian cities, Venice used in old times to be the principal home, after Rome, of carnival. To-day Turin, Milan, Florence, Naples, all put forth competing programmes. In old times Florence was conspicuous for the licentiousness of its carnival; and the *Canti Carnascialeschi*, or carnival songs, of Lorenzo de' Medici show to what extent the licence was carried. The carnival in Spain lasts four days, including Ash Wednesday. In France the merry-making is restricted almost entirely to Shrove Tuesday, or *mardi gras*. In Russia, where no Ash Wednesday is observed, carnival gaieties last a week from Sunday to Sunday.

CARNIVORA, the zoological order typified by the larger carnivorous placental land mammals of the present day, such as lions, tigers and wolves, but also including species like bears whose diet is largely vegetable, as well as a number of smaller flesh-eating species, together with the seals and their relatives, and an extinct Tertiary group. Apart from this distinct group (see Creodonta), the Carnivora are characterized by the following features. They are unguiculate, or clawed mammals, with never less than four toes to each foot, of which the first is never opposable to the rest; the claws, or nails, being more or less pointed although occasionally rudimentary. The teeth comprise a deciduous and a permanent series, all being rooted, and the latter divisible into the usual four series. In front there is a series of small pointed incisors, usually three in number, on each side of both jaws, of which the first is always the smallest and the third the largest, the difference being most marked in the upper jaw; these are followed by strong conical, pointed, recurved canines; the premolars and molars are variable, but generally, especially in the anterior part of the series, more or less compressed, pointed and trenchant; if the crowns are flat and tuberculated, they are never complex or divided into lobes by deep inflexions of enamel. The condyle of the lower jaw is a transversely placed half-cylinder working in a deep glenoid fossa of corresponding form. The brain varies much in size and form, but the hemispheres are never destitute of convolutions. The stomach is always simple and pyriform; the caecum is either absent or short and simple; and the colon is not sacculated or much wider than the small intestine. Vesiculae seminales are never developed, but Cowper's glands may be present or absent. The uterus is two-horned, and the teats are abdominal and variable in number; while the placenta is deciduate, and almost always zonary. The clavicle is often absent, and when present never complete. The radius and ulna are distinct; the scaphoid and lunar of the tarsus are united; there is never an os centrale in the adult; and the fibula is distinct.

The large majority of the species subsist chiefly on animal food, though many are omnivorous, and a few chiefly vegetable-eaters. The more typical forms live altogether on recently-killed warm-blooded animals, and their whole organization is thoroughly adapted to a predaceous mode of life. In conformity with this manner of obtaining their subsistence, they are generally bold and savage in disposition, though some are capable of being domesticated, and when placed under favourable circumstances exhibit a high degree of intelligence.

I. Fissipedia

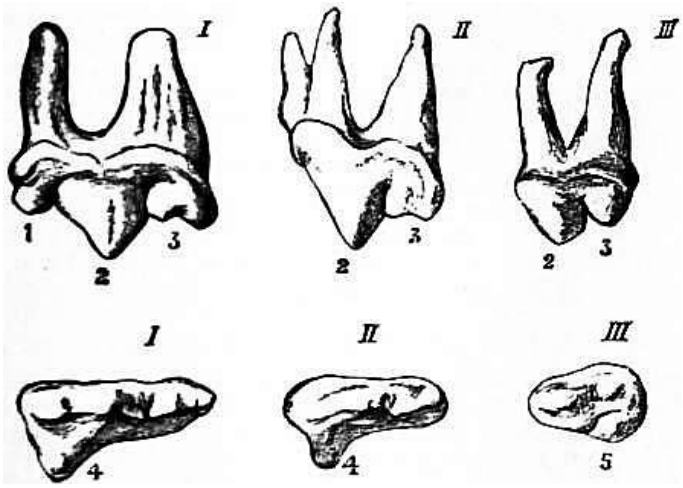

FIG. I.—Left upper sectorial or carnassial teeth of Carnivora. I, *Felis*; II, *Canis*; III, *Ursus*. 1, anterior, 2, middle, and 3, posterior cusp of blade; 4, inner cusp supported on distinct root; 5, inner cusp, posterior in position, and without distinct root, characteristic of the *Ursidae*.

The typical section of the group, the Carnivora Vera, Fissipedia or Carnassidentia, includes all the existing terrestrial members of the order, together with the otters and sea-otters. In this section the fore-limbs never have the first digit, or the hind-limbs the first and fifth digits, longer than the others; and the incisors are $\frac{3}{3}$ on each side, with very rare exceptions. The cerebral hemispheres are more or less elongated; always with three or four convolutions on the outer surface forming arches above each other, the lowest surrounding the Sylvian fissure. In the cheek-series there is one specially modified tooth in each jaw, to which the name of “sectorial” or “carnassial” is applied. The teeth in front of this are more or less sharp-pointed and compressed; the teeth behind broad and tuberculated. The characters of the sectorial teeth deserve special attention, as, though fundamentally the same throughout the group, they are greatly modified in different genera. The upper sectorial is the most posterior of the teeth which have predecessors, and is therefore reckoned as the last premolar (p. 4 of the typical dentition). It consists of a more or less compressed blade supported on two roots and an inner lobe supported by a distinct root (see fig. 1). The blade when fully developed has three cusps (i, 2 and 3), but the anterior is always small, and often absent. The middle cusp is conical, high and pointed; and the posterior cusp has a compressed, straight, knife-like edge. The inner cusp. (4) varies in extent, but is generally placed near the anterior end of the blade, though sometimes median in position. In the *Ursidae* alone both the inner cusp and its root are wanting, and there is often a small internal and posterior cusp (5) without root. In this family also the sectorial is relatively to the other teeth much smaller than in other Carnivora. The lower sectorial (fig. 2) is the most anterior of the teeth without predecessors in the milk-series, and is therefore reckoned the first molar. It has two roots supporting a crown, consisting when fully developed of a compressed bilobed blade (1 and 2), a heel (4), and an inner tubercle (3). The cusps of the blade, of which the hinder (2) is the larger, are separated by a notch, generally prolonged into a linear fissure. In the specialized *Felidae* (I) the blade alone is developed, both heel and inner tubercle being absent or rudimentary. In *Meles* (V) and *Ursus* (VI) the heel is greatly developed, broad and tuberculated. The blade in these cases is generally placed obliquely, its flat or convex (outer) side looking forwards, so that the two lobes or cusps are almost side by side, instead of anterior and posterior. The inner tubercle (3) is generally a conical pointed cusp, placed to the inner side of the hinder lobe of the blade. The special characters of these teeth are more disguised in the sea-otter than in any other species, but even here they can be traced.

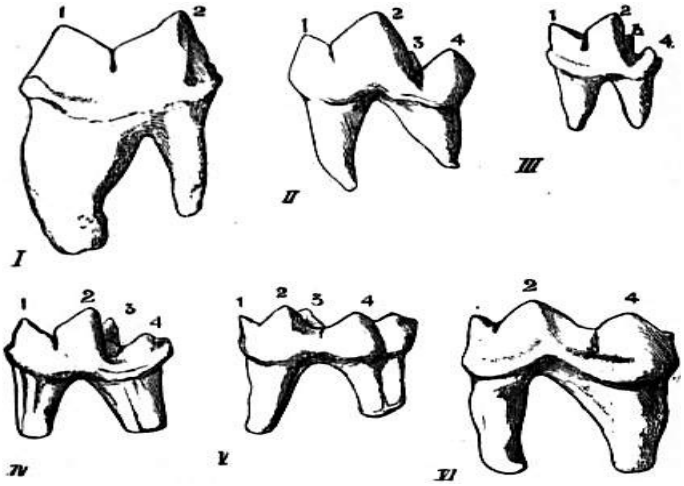

FIG. 2.—Left lower sectorial or carnassial teeth of Carnivora, I, *Felis*; II, *Canis*; III, *Herpestes*; IV, *Lutra*; V, *Meles*; VI, *Ursus*. 1, Anterior cusp of blade; 2, posterior cusp of blade; 3, inner tubercle; 4, heel. It will be seen that the relative size of the two roots varies according to the development of the portion of the crown they respectively support.

The toes are nearly always armed with large, strong, curved and sharp claws, ensheathing the terminal phalanges and held firmly in place by broad plates of bone reflected over their attached ends from the bases of the phalanges. In the *Felidae* these claws are “retractile”; the terminal phalange with the claw attached, folding back in the fore-foot into a sheath by the outer or ulnar side of the middle phalange of the digit, and retained in this position when at rest by a strong elastic ligament. In the hind-foot the terminal joint or phalange is retracted on to the top, and not the side of the middle phalange. By the action of the deep flexor muscles the terminal phalanges are straightened, the claws protruded from their sheath, and the soft “velvety” paw becomes suddenly converted into a formidable weapon of offence. The habitual retraction of the claws preserves their points from wear.

The land Carnivora are best divided into two subgroups or sections—(A) the Aeluroidea, or Herpestoidea, and (B) the Arctoidea; the recognition of a third section, Cynoidea, being rendered untenable by the evidence of extinct forms.

(A) *Aeluroidea*.—In this section, which comprises the cats (*Felidae*), civets (*Viverridae*), and hyenas (*Hyaenidae*), the tympanic bone is more or less ring-like, and forms only a part of the outer wall of the tympanic cavity; an inflated alisphenoid bulla is developed; and the external auditory meatus is short. In the nasal chamber the maxillo-turbinal is small and doubly folded, and does not cut off the naso-turbinal and adjacent bones from the nasal aperture. The carotid canal in the skull is short or absent. Cowper’s glands are present, as is a prostate gland and a caecum, as well as a duodenal-jejunal flexure in the intestine, but an os penis is either wanting or small.

Cat tribe.

The members of the cat tribe, or *Felidae*, are collectively characterized by the following features. An alisphenoid is lacking on the lower aspect of the skull. In existing forms the usual dental formula is i. ⅗, c. ⅓, p. ⅗, m. ⅓; the upper molar being rudimentary and placed on the inner side of the carnassial, but the first premolar may be absent, while, as an abnormality, there may be a small second lower molar, which is constantly present in some of the extinct forms. The auditory bulla and the tympanic are divided by an internal partition. The paroccipital process is separate from, or only extends to a slight degree upon the auditory bulla. The thoracic vertebrae number 13; the feet are digitigrade, with five front and four hind toes, of which the claws are retractile; and the metatarsus is haired all round. Anal glands are present.

As regards the teeth, when considered in more detail, the incisors are small, and the canines large, strong, slightly recurved, with trenchant edges and sharp points, and placed wide apart. The premolars are compressed and sharp-pointed; the most posterior in the upper jaw (the sectorial) being a large tooth, consisting of a compressed blade, divided into three unequal cusps supported by two roots, with a small inner lobe placed near the front and supported by a distinct root (fig. 1, I). The upper molar is a small tubercular tooth placed more or less transversely at the inner side of the hinder end of the last. In the lower jaw the molar (sectorial) is reduced to the blade, which is large, trenchant, compressed and divided into two subequal lobes (fig. 2, I). Occasionally it has a rudimentary heel, but never an inner tubercle. The skull generally is short and rounded, though proportionally more elongated in the larger forms; with the facial portion short and broad, and the zygomatic arches wide and strong. The auditory bullae are large, rounded and smooth. Vertebrae: C. 7, D. 13, L. 7, S. 3, Ca. 13-29. Clavicles better developed than in other Carnivora, but not articulating with either

the shoulder-bones or sternum. Of the five front toes, the third and fourth are nearly equal and longest, the second slightly, and the fifth considerably shorter. The first is still shorter, not reaching the metacarpophalangeal articulation of the second. In the hind-feet the third and fourth toes are the longest, the second and fifth somewhat shorter and nearly equal, while the first is represented only by the rudimentary metatarsal bone. The claws are large, strongly curved, compressed, very sharp, and exhibit the retractile condition in the highest degree. The tail varies greatly in length, being in some species a mere stump, in others nearly as long as the body. The ears are of moderate size, more or less triangular and pointed; and the eyes rather large, with the iris mobile, and with a pupillary aperture which contracts under the influence of light in some species to a narrow vertical slit, in others to an oval, and in some to a circular aperture. The tongue is thickly covered with sharp, pointed, recurved horny papillae; and the caecum is small and simple.

As in structure so in habits, the cat may be considered the most specialized of all Carnivora, although they exhibit many features connecting them with extinct types. All the members of the group feed almost exclusively on warm-blooded animals which they have themselves killed, but one Indian species, *Felis viverrina*, is said to prey on fish, and even fresh-water molluscs. Unlike dogs, they never associate in packs, and rarely hunt their prey on open ground, but from some place of concealment wait until the unsuspecting victim comes within reach, or with noiseless and stealthy tread, crouching close to the ground for concealment, approach near enough to make the fatal spring. In this manner they frequently attack and kill animals considerably exceeding their own size. They are mostly nocturnal, and the greater number, especially the smaller species, more or less arboreal. None are aquatic, and all take to the water with reluctance, though some may habitually haunt the banks of rivers or pools, because they more easily obtain their prey in such situations. The numerous species are widely diffused over the greater part of the habitable world, though most abundant in the warm latitudes of both hemispheres. None are, however, found in the Australian region, or in Madagascar. Although the Old World and New World cats (except perhaps the northern lynx) are all specifically distinct, no common structural character has been pointed out by which the former can be separated from the latter. On the contrary, most of the groups into which the family may be divided have representatives in both hemispheres.

Notwithstanding the considerable diversity in external appearance and size between different members of this extensive family, the structural differences are but slight. The principal differences are to be found in the form of the cranium, especially of the nasal and adjoining bones, the completeness of the bony orbit posteriorly, the development of the first upper premolar and of the inner lobe of the upper sectorial, the length of the tail, the form of the pupil, and the condition and coloration of the fur, especially the presence or absence of tufts or pencils of hair on the external ears.

In the typical genus *Felis*, which includes the great majority of the species, and has a distribution coextensive with that of the family, the upper sectorial tooth has a distinct inner cusp, the claws are completely contractile, the tail is long or moderate, and the ears do not carry distinct tufts of hair. As regards the larger species, the lion (*F. leo*), tiger (*F. tigris*), leopard (*F. pardus*), ounce or snow-leopard (*F. uncia*) and clouded leopard (*F. nebulosa*) are described in separate articles. Of other Old World species it must suffice to mention that the Tibetan Fontanier's cat (*F. tristis*), and the Indian marbled cat (*F. marmorata*), an ally of the above-mentioned clouded leopard, appear to be the Asiatic representatives of the American ocelots. The Tibetan Pallas's cat (*F. manul*) has been made the type of a distinct genus, *Trichaelurus*, in allusion to its long coat. One of the largest of the smaller species is the African serval, *q.v.* (*F. serval*), which is yellow with solid black spots, has long limbs, and a relatively short tail. Numerous "tiger-cats" and "leopard-cats," such as the spotted *F. bengalensis* and the uniformly chestnut *F. badia*, inhabit tropical Asia; while representative species occur in Africa. The jungle-cat (*F. chaus*), which in its slightly tufted ears and shorter tail foreshadows the lynxes, is common to both continents. Another African species (*F. ocreata*) appears to have been the chief progenitor of the European domestic cat, which has, however, apparently been crossed to some extent with the ordinary wild cat (*F. catus*). Of the New World species, *F. concolor*, the puma or couguar, commonly called "panther" in the United States, is about the size of a leopard, but of a uniform brown colour, spotted only when young, and is extensively distributed in both North and South America, ranging between the parallels of 60° N. and 50° S., where it is represented by numerous local races, varying in size and colour. *F. onca*, the jaguar, is a larger and more powerful animal than the last, and more resembles the leopard in its colours; it is also found in both North and South America, although with a less extensive range, reaching northwards only as far as Texas, and southwards nearly to Patagonia (see JAGUAR). *F. pardalis* and several allied smaller, elegantly-spotted species inhabiting the intratropical regions of America, are commonly confounded under the name of ocelot or tiger-cat. *F. yaguarondi*, rather larger than the domestic cat, with an elongated head and body, and of a uniform brownish-grey colour, ranges from northern Mexico to Paraguay; while the allied *F. eyra* is a small cat, weasel-like in form, having an

elongated head, body and tail, and short limbs, and is of a uniform light reddish-brown colour. It is a native of South America and Mexico. *F. pajeros* is the Pampas cat.

The typical lynxes, as represented by *Lynx borealis* (*L. lynx*), the southern *L. pardina*, and the American *L. rufa*, are a northern group common to both hemispheres, and characterized by their tufted ears, short tail, and the presence of a rudimentary heel to the lower carnassial tooth. As a rule, they are more or less spotted in winter, but tend to become uniformly-coloured in summer. They are connected with the more typical cats by the long-tailed and uniformly red caracal, *Lynx (Caracal) caracal*, of India, Persia and Africa, and the propriety of separating them from *Felis* may be open to doubt (see Lynx and Caracal).

However this may be, there can be no doubt of the right of the hunting-leopard or chita (cheeta), as, in common with the leopard, it is called in India, to distinction from all the other cats as a distinct genus, under the name of *Cynaelurus jubatus*. From all the other *Felidae* this animal, which is common to Asia and Africa, is distinguished by the inner lobe of the upper sectorial tooth, though supported by a distinct root, having no salient cusp upon it, by the tubercular molar being more in a line with the other teeth, and by the claws being smaller, less curved and less completely retractile, owing to the feebler development of the elastic ligaments. The skull is short and high, with the frontal region broad and elevated in consequence of the large development of air-sinuses. The head is small and round, the body light, the limbs and tail long, and the colour pale yellowish-brown with small solid black spots (see Cheeta).

Civet tribe.

The family *Viverridae*, which includes the civet-cats, genets and mongooses, is nearly allied to the *Felidae*, but its members have a fuller dentition, and exhibit certain other structural differences from the cats, to the largest of which they make no approach in the matter of bodily size. As a rule, there is an alisphenoid canal; the cheek-dentition is p. $^{3\text{ or }4}/_{3\text{ or }4}$, m. $^{1\text{ or }2}/_{1\text{ or }2}$ The bulla is small and the tympanic large, with a low division between them; and the paroccipital process is leaf-like and spread over the bulla. The number of dorsal vertebrae, except in the aberrant *Proteles*, is 13 or 14; the claws may be either completely or partially retractile or non-retractile; generally each foot has five toes, but there may be four in front and five behind, the reverse of this, or only four on each foot; the gait may be either digitigrade or partially plantigrade; and the metatarsus may be either hairy or naked inferiorly. Anal, and in some cases also perineal, glands are developed. The family is limited to the warmer parts of the Old World.

Considerable difference of opinion prevails with regard to the serial position of the fossa, or foussa (*Cryptoprocta ferox*), of Madagascar, some writers considering that its affinities are so close to the *Felidae* that it ought not to be included in the present family at all. Others, on the contrary, see no reason to separate it from the *Viverrinae* or more typical representatives of the civet-tribe. As a medium course, it may be regarded as the sole representative of a special subfamily—*Cryptoproctinae*—of the *Viverridae*. The subfamily and genus are characterized by possessing a total of 36 teeth, arranged as i. $^3/_3$, c. $^1/_1$, p. $^4/_4$, m. $^1/_1$. The teeth generally closely resemble those of the *Felidae*, the first premolar of both jaws being very minute and early deciduous; the upper sectorial has a small inner lobe, quite at the anterior part; the molar is small and placed transversely; and the lower sectorial has a large trenchant bilobed blade, and a minute heel, but no inner tubercle. The skull is generally like that of *Felis*, but proportionally longer and narrower, with the orbit widely open behind. Vertebrae: C. 7, D. 13, L. 7, S. 3, Ca. 29. Body elongated. Limbs moderate in size. Feet subplantigrade, with five well-developed toes on each, carrying sharp, compressed, retractile claws. Ears moderate. Tail long and cylindrical. The foussa is a sandy-coloured animal with an exceedingly long tail (see Foussa).

The more typical members of the group, constituting the subfamily *Viverrinae*, are characterized by their sharp, curved and largely retractile claws, the presence of five toes to each foot, and of perineal and one pair of anal glands, and a tympanic bone which retains to a great extent the primitive ring-like form, so that the external auditory meatus has scarcely any inferior lip, its orifice being close to the tympanic ring. The first representatives of the subfamily are the civet-cats, or civets (*Viverra* and *Viverricula*), and the genets (*Genetta*), in all of which the dentition is i. $^3/_3$, c. $^1/_1$, p. $^4/_4$, m. $^2/_2$; total 40. The skull is elongated, with the facial portion small and compressed, and the orbits well-defined but incomplete behind. Vertebrae: C. 7, D. 13, L. 7 (or D. 14, L. 6), S. 3, Ca. 22-30. Body elongated and compressed. Head pointed in front; ears rather small. Extremities short. Feet small and rounded. Toes short, the first on fore and hind feet much shorter than the others. Palms and soles covered with hair, except the pads of the feet and toes, and in some species a narrow central line on the under side of the sole, extending backwards nearly to the heel. Tail moderate or long. The pair of large glands situated on the perineum (in both sexes) secretes an oily substance of a peculiarly penetrating odour. In the true civets, which include the largest members of the group, the teeth are stouter and less compressed than in the other genera; the second upper molar being especially large, and the auditory bulla smaller and more pointed in front; the

body is shorter and stouter; the limbs are longer; the tail shorter and tapering. The under side of the tarsus is completely covered with hair, and the claws are longer and less retractile. Fur rather long and loose, and in the middle line of the neck and back especially elongated so as to form a sort of crest or mane. Pupil circular when contracted. Perineal glands greatly developed. These characters apply especially to *V. civetta*, the African civet, or civet-cat, as it is commonly called, an animal rather larger than a fox, and an inhabitant of intratropical Africa. *V. zibetta*, the Indian civet, of about equal size, approaches in many respects, especially in the characters of the teeth and feet and absence of the crest of elongated hair on the back, to the next section. It inhabits Bengal, China, the Malay Peninsula and adjoining islands. *V. tangalunga* is a smaller but nearly allied animal from the same part of the world. From these three species and the next the civet of commerce, once so much admired as a perfume in England, and still largely used in the East, is obtained. The animals are kept in cages, and the odoriferous secretion collected by scraping the interior of the perineal follicles with a spoon or spatula. The single representative of the genus *Viverricula* resembles in many respects the genets, but agrees with the civets in having the whole of the under side of the tarsus hairy; the alisphenoid canal is generally absent. *V. malaccensis*, the rasse, inhabiting India, China, Java and Sumatra, is an elegant little animal which affords a favourite perfume to the Javanese. The genets (*Genetta*) are smaller animals, with more elongated and slender bodies, and shorter limbs than the civets. The skull is elongated and narrow; and the auditory bulla large, elongated and rounded at both ends. The teeth are compressed and sharp-pointed, with a lobe on the inner side of the third, upper premolar not present in the previous genera. Pupil contracting to a linear aperture. Tail long, slender, ringed. Fur short and soft, spotted or cloudy. Under side of the metatarsus with a narrow longitudinal bald streak. *Genetta vulgaris*, or *G. genetta*, the common genet, is found in France south of the river Loire, Spain, south-western Asia and North Africa. *G. felina, senegalensis, tigrina, victoriae* and *pardalis* are other named species, all African in habitat.

The Malagasy fossane (*Fossa daubentoni*), which has but little markings on the fur of the adult, differs by the absence of a scent-pouch and the presence of a couple of bare spots on the under surface of the metatarsus. The beautiful linsangs (*Linsanga* or *Prionodon*), ranging from the eastern Himalaya to Java and Borneo, are represented by two or three species, easily recognizable by the broad transverse bands of blackish brown and yellow with which the body and tail are marked. They are specially distinguished by having only one pair of upper molars, thereby resembling the cats, with which, in correlation with their arboreal habits, they agree in their highly retractile claws, and the hairy surface of the under side of the metatarsus. About 15 in. is the length of the type species. In West Africa the linsangs are represented by *Poiana richardsoni*, a small species with a spotted genet-like coat, and also with a narrow naked stripe on the under surface of the metatarsus, as in genets.

Here may be placed the two African spotted palm-civets of the genus *Nandinia*, namely *N. binotata* from the west and *N. gerrardi* from the east forest-region. In common with the true palm-civets, they have a dentition numerically identical with that of *Viverra* and *Genetta*, but the cusps of the hinder premolars and molars are much less sharp and pointed. They are peculiar in that the wall of the inner chamber of the auditory bulla never ossifies, while the paroccipital process is not flattened out and spread over the bulla. In this respect they resemble the Miocene European genus *Amphictis*, as they do in the form of their teeth, so that they may be regarded as nearly related to the ancestral *Viverridae*, and forming in some degree a connecting link between the present and the next subfamily. *Nandinia* is also peculiar in possessing a kind of rudimentary marsupial pouch. Apparently *Eupleres goudoti*, of Madagascar, which has been generally classed in the *Herpestinae*, is a nearly related animal, characterized by the reduction of its dentition, due to insectivorous habits (fig. 3); the canines being small, the anterior premolars canine-like, and the hinder premolars molariform. It is a uniformly-coloured creature of medium size.

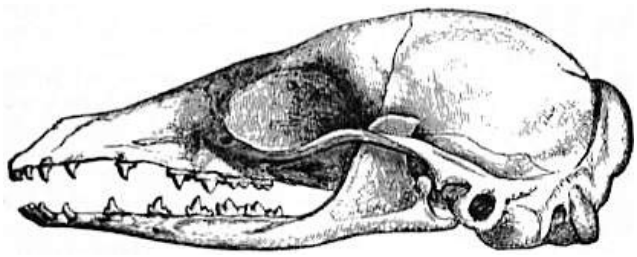

FIG. 3.—Skull of *Eupleres goudoti*.

The palm-civets, or paradoxures, constituting the Asiatic genus *Paradoxurus*, have, as already stated, the following dental formula, viz. i. $\frac{3}{3}$, c. $\frac{1}{1}$, p. $\frac{4}{4}$, m. $\frac{2}{2}$, total 40; the cusps of the molars being low and blunted, and these teeth in the upper jaw much broader than in the civets. The head is pointed in front, with small rounded ears; the limbs are of medium length,

with the soles of the feet almost completely naked, and fully retractile claws; while the long tail is not prehensile and clothed with hair of moderate length. Spots are the chief type of marking. The vertebrae number C. 7, D. 13, L. 7, S. 3, Ca. 29-36. Numerous relatively large species ranging from India to Borneo, Sumatra and Celebes, with one in Tibet, represent the genus. Nearly allied are *Arctogale leucotis*, with a wide distribution, and *A. trivirgata*, of Java, both longitudinally striped species, with small and slightly separated molars, and a prolonged bony palate (see PALM-CIVET).

The binturong (*Arctictis binturong*) has typically the same dental formula as the last, but the posterior upper molar and the first lower premolar are often absent. Molars small and rounded, with a distinct interval between every two, but formed generally on the same pattern as *Paradoxurus*. Vertebrae: C. 7, D. 14, L. 5, S. 3, Ca. 34. Body elongated; head broad behind, with a small pointed face, long and numerous whiskers, and small ears, rounded, but clothed with a pencil of long hairs. Eyes small. Limbs short, with the soles of the feet broad and entirely naked. Tail very long and prehensile. Fur long and harsh. Caecum extremely small. The binturong inhabits southern Asia from Nepal through the Malay Peninsula to the islands of Sumatra and Java. Although structurally agreeing closely with the paradoxures, its tufted ears, long, coarse and dark hair, and prehensile tail give it a very different external appearance. It is slow and cautious in its movements, chiefly if not entirely arboreal, and appears to feed on vegetables as well as animal substances (see BINTURONG).

Hemigale is another modification of the paradoxure type, represented by *H. hardwickei* of Borneo, an elegant-looking animal, smaller and more slender than the paradoxures, of light grey colour, with transverse broad dark bands across the back and loins.

Cynogale also contains one Bornean species, *C. bennetti*, a curious otter-like modification of the viverrine type, having semi-aquatic habits, both swimming in the water and climbing trees, living upon fish, crustaceans, small mammals, birds and fruits. The number and general arrangement of the teeth are as in *Paradoxurus*, but the premolars are peculiarly elongated, compressed, pointed and recurved, though the molars are tuberculated. The head is elongated, with the muzzle broad and depressed, the whiskers are very long and abundant, and the ears small and rounded. Toes short and slightly webbed at the base. Tail short, cylindrical, covered with short hair. Fur very dense and soft, of a dark-brown colour, mixed with black and grey.

In the mongoose group, or *Herpestinae*, the tympanic or anterior portion of the auditory bulla is produced into an ossified external auditory meatus of considerable length; while the paroccipital process never projects below the bulla, on the hinder surface of which, in adult animals, it is spread out and completely lost. The toes are straight, with long, unsheathed, non-retractile claws.

In the typical mongooses or ichneumons, *Herpestes*, the dental formula is i. $\frac{3}{3}$, c. $\frac{1}{1}$, p. $\frac{(4 \text{ or } 3)}{(4 \text{ or } 3)}$, m. $\frac{2}{2}$; total 40 or 36; the molars having generally strongly-developed, sharply-pointed cusps. The skull is elongated and constricted behind the orbits. The face is short and compressed, with the frontal region broad and arched. Post-orbital processes of frontal and jugal bones well developed, generally meeting so as to complete the circle of the orbit behind. Vertebrae: C. 7, D. 13, L. 7, S. 3, Ca. 21-26. Head pointed in front. Ears short and rounded. Body long and slender. Extremities short. Five toes on each foot, the first, especially that on the hind-foot, very short. Toes free, or but slightly palmated. Soles of fore-feet and terminal portion of those of hind-pair naked; under surface of metatarsus clothed with hair. Tail long or moderate, generally thick at the base, and sometimes covered with more or less elongated hair. The longer hairs covering the body and tail almost always ringed. The genus is common to the warmer parts of Asia and Africa, and while many of the species, like the Egyptian *H. ichneumon* and the ordinary Indian mongoose, *H. mungo*, are pepper-and-salt coloured, the large African *H. albicauda* has the terminal two-thirds of the tail clothed with long white hairs (see ICHNEUMON).

The following distinct African and Malagasy generic representatives of the subfamily are recognized, viz. *Helogale*, with $\frac{3}{3}$ premolars, and containing the small South African *H. parvula* and a variety of the same. *Bdeogale crassicauda* and two allied tropical African species differ from *Herpestes* in having only four toes on each foot. The orbit is nearly complete, and the tail of moderate length and rather bushy. In *Cynictis*, which has the orbit completely closed, there are five front and four hind toes; and the skull is shorter and broader than in *Herpestes*, rather contracted behind the orbits, the face short, and the anterior chamber of the auditory bulla very large. The front claws are elongated. Includes only *C. penicillata* from South Africa.

All the foregoing herpestines have the nose short, with its under surface flat, bald, and with a median longitudinal groove. The remaining forms have the nose more or less produced, with its under side convex, and a space between the nostrils and the upper lip covered with closely pressed hairs, and without any median groove. The South African *Rhynchogale*

muelleri, a reddish animal with five toes to each foot and ⁴⁄₄ (abnormally ⁵⁄₅) premolars, alone represents the first genus. The cusimanses (*Crossarchus*), which differ by having only ³⁄₃ premolars, and thus a total of 36 teeth, include, on the other hand, several species. The muzzle is elongated, the claws on the fore-feet are long and curved, the first front toe is very short; the under surface of the metatarsus naked; and the tail shorter than the body, tapering. Fur harsh. Includes *C. obscurus*, the cusimanse, a small burrowing animal from West Africa, of uniform dark-brown colour, *C. fasciatus, C. zebra, C. gambianus* and others. Lastly, we have *Suricata*, a more distinct genus than any of the above. The dental formula is as in the last, but the teeth of the molar series are remarkably short in the antero-posterior direction, corresponding with the shortness of the skull generally. Orbits complete behind. Vertebrae: C. 7, D. 15, L. 6, S. 3, Ca. 20. Though the head is short and broad, the nose is pointed and rather produced and movable, while the ears are very short. Body shorter and limbs longer than in *Herpestes*. Toes 4-4. Claws on fore-feet very long and narrow, arched, pointed and subequal. Hind-feet with shorter claws, soles hairy. Tail rather shorter than the body. One species only is known, the meerkat or suricate, *S. tetradactyla*, a small grey-brown animal, with dark transverse stripes on the hinder part of the back, from South Africa.

The names *Galidictis, Galidia* and *Hemigalidia* indicate three generic modifications of the *Herpestinae*, all inhabitants of Madagascar. The best-known, *Galidia elegans, is* a lively squirrel-like little animal with soft fur and a long bushy tail, which climbs and jumps with agility. It is of a chestnut-brown colour, the tail being ringed with darker brown. *Galidictis vittata* and *G. striata* chiefly differ from the ichneumons in their coloration, being grey with parallel longitudinal stripes of dark brown.

Considerable diversity of opinion prevails with regard to the serial position of the aard-wolf, or maned jackal (*Proteles cristatus*), of southern and eastern Africa, some authorities making it the representative of a family by itself, others referring it to the *Hyaenidae*, while others again regard it as a modified member of the *Viverridae*. After all, the distinction either way cannot be very great, since the two families just named are intimately connected by marks of the extinct *Ictitherium*, With the *Viverridae* it agrees in having the auditory bulla divided, while in the number of dorsal vertebrae it is hyena-like. The cheek-teeth are small, far apart, and almost rudimentary in character (see fig. 4), and the canines long and rather slender. The dental formula is i. ³⁄₃, c. ¹⁄₁, p.m. ⁴⁄₃ or ₄; total 30 or 32. Vertebrae: C. 7, D. 15, L. 5, S. 2, Ca. 24. The fore-feet with five toes; the first, though short, with a distinct claw. The hind-feet with four subequal toes; all, like those of the fore-foot, furnished with strong, blunt, non-retractile claws (see AARD-WOLF).

Hyena tribe.

The hyenas or hyaenas (*Hyaenidae*) differ from the preceding family (*Viverridae*) in the absence of a distinct vertical partition between the two halves of the auditory bulla; and are further characterized by the absence of an alisphenoid canal, the reduction of the molars to ¹⁄₁, and the presence of 15 dorsal vertebrae. The dental formula in the existing forms (to which alone all these remarks apply) is i. ³⁄₃, c. ¹⁄₁. p. ⁴⁄₃ m. ¹⁄₁; total 34; the teeth, especially the canines and premolars, being very large, strong and conical. Upper sectorial with a large, distinctly trilobed blade and a moderately developed inner lobe placed at the anterior extremity of the blade. Molar very small, and placed transversely close to the hinder edge of the last, as in the *Felidae*. Lower sectorial consisting of little more than the bilobed blade. Zygomatic arches of skull very wide and strong; and sagittal crest high, giving attachment to very powerful biting muscles. Orbits incomplete behind. Vertebrae: C. 7, D. 15, L. 5, S. 4, Ca. 19. Limbs rather long, especially the anterior pair, digitigrade, four subequal toes on each, with stout non-retractile claws, the first toes being represented by rudimentary metacarpal and metatarsal bones. Tail rather short. A large post-anal median glandular pouch, into which the largely developed anal scent glands pour their secretion.

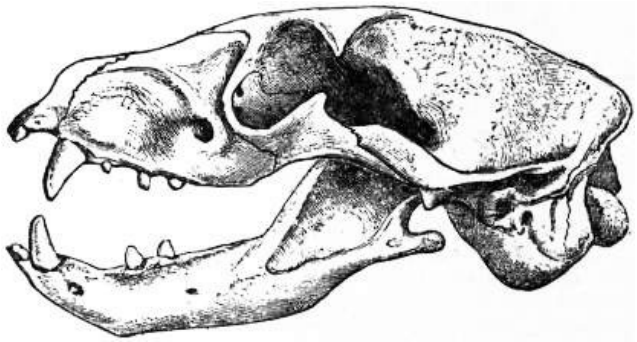

FIG. 4.—Skull and Dentition of Aard-Wolf (*Proteles cristatus*.)

The three well-characterized species of *Hyaena* are divisible into two sections, to which

some zoologists assign generic rank. In the typical species the upper molar is moderately developed and three-rooted; and an inner tubercle and heel more or less developed on the lower molar. Ears large and pointed. Hair long, forming a mane on the back and shoulders. Represented firstly by *H. striata*, the striped hyena of northern and eastern Africa and southern Asia; and *H. brunnea* of South Africa, in some respects intermediate between this and the next section. In the second section, forming the subgenus *Crocuta*, the upper molar is extremely small, two- or one-rooted, often deciduous; the lower molar without trace of inner tubercle, and with an extremely small heel. Ears moderate, rounded. Hair not elongated to form a mane. The spotted hyena, *Hyaena (Crocuta) crocuta*, of which, like the striped species, there are several local races, represents this group, and ranges all over Africa south of the Sahara. In dental characters the first section inclines more to the *Viverridae*, the second to the *Felidae*; or the second may be considered as the more specialized form, as it certainly is in its visceral anatomy, especially in that of the reproductive organs of the female. (See HYENA.)

(B) *Arctoidea*.—So far as the auditory region of the skull is concerned, the existing representatives of the dog tribe or *Canidae* are to a great extent intermediate between the cat and civet group (*Aeluroidea*) on the one hand, and the typical representatives of the bear and weasel group on the other. They were consequently at one time classed in an intermediate group—the Cynoidea; but fossil forms show such a complete transition from dogs to bears as to demonstrate the artificial character of such a division. Consequently, the dogs are included in the bear-group. In this wider sense the Arctoidea will be characterized by the tympanic bone being disk-shaped and forming the whole of the outer wall of the tympanic cavity; the large size of the external auditory meatus or tube; and the large and branching maxillo-turbinal bone, which cuts off the naso-turbinal and two adjacent bones from the anterior nasal chamber. The tympanic bulla has no internal partition. There is a large carotid canal. Cowper's glands are lacking; and there is a large penial bone.

Dog tribe.

From all the other members of the group the *Canidae* are broadly distinguished (in the case of existing forms) by the large and well-developed tympanic bulla, with which the paroccipital process is in contact. An alisphenoid canal is present. The feet are digitigrade, usually with five (in one instance four) front and always four hind-toes. The molars—generally $\frac{2}{3}$—have tall cusps, and the sectorials are large and powerful (figs. 1 and 2). The intestine has both a duodeno-jejunal flexure and a caecum. A prostate gland is present; but there are no glands in the vasa deferentia; the penial bone is grooved; and anal glands are generally developed. The distribution of the family is cosmopolitan. The normal dentition is i. $\frac{3}{3}$, c. $\frac{1}{1}$, p. $\frac{4}{4}$, m. $\frac{2}{3}$; total 42; thus differing from the typical series only by the loss of the last pair of upper molars (present in certain extinct forms). In the characters of the teeth the group is the most primitive of all Carnivora. Typically the upper secterial (fig. 1, II) consists of a stout blade, of which the anterior cusp is almost obsolete, the middle cusp large, conical and pointed backwards, and the posterior cusp in the form of a compressed ridge; the inner lobe is very small, and placed at the fore part of the tooth. The first molar is more than half the antero-posterior length of the sectorial, and considerably wider than long; its crown consists of two prominent conical cusps, of which the anterior is the larger, and a low, broad inward prolongation, supporting two more or less distinct cusps and a raised inner border. The second molar resembles the first in general form, but is considerably smaller. The lower sectorial (fig. 2, II) is a large tooth, with a strong compressed bilobed blade, the hinder lobe being considerably the larger and more pointed, a small but distinct inner tubercle placed at the hinder margin of the posterior lobe of the blade, and a broad, low, tuberculated heel, occupying about one-third of the whole length of the tooth. The second molar is less than half the length of the first, with a pair of cusps placed side by side anteriorly, and a less distinct posterior pair. The third is an extremely small and simple tooth with a subcircular tuberculated crown and single root.

Views differ in regard to the best classification of the *Canidae*, some writers adopting a number of generic groups, while others consider that very few meet the needs of the case. In retaining the old genus *Canis* in the wide sense, that is to say, inclusive of the foxes, Professor Max Weber is followed. The best cranial character by which the different members of the family may be distinguished is that in dogs, wolves and jackals the post-orbital process of the frontal bone is regularly smooth and convex above, with its extremity bent downwards, whereas in foxes the process is hollowed above, with its outer margin (particularly of the anterior border) somewhat raised. This modification coincides in the main with the division of the group into two parallel series, the Thooids or Lupine forms and Alopecoids or Vulpine forms, characterized by the presence of frontal air-sinuses in the former, which not only affects the external form but to a still greater degree the shape of the anterior part of the cranial cavity, and the absence of such sinuses in the latter. The pupil of the eye when contracted is round in most members of the first group, and vertically elliptical in the others, but more observations are required before this character can be absolutely relied upon. The form and length of the tail is often used for the purposes of classification, but its characters

do not coincide with those of the cranium, as many of the South American *Canidae* have the long bushy tails of foxes and the skulls of wolves.

FIG. 5.—The African Hunting-Dog (*Lycaon pictus*).

The most aberrant representative of the thooid series is the African hunting-dog (*Lycaon pictus*, fig. 5), which differs from the other members of this series by the teeth being rather more massive and rounded, the skull shorter and broader, and the presence of but four toes on each limb, as in *Hyena*. The hunting-dog, from south and east Africa, is very distinct externally from all other *Canidae*; being nearly as large as a mastiff, with large, broadly ovate erect ears and a singular colouring, often consisting of unsymmetrical large spots of white, yellow and black. It presents some curious superficial resemblances to *Hyena crocuta*, perhaps a case of mimetic analogy, and hunts its prey in large packs. Several local races, one of which comes from Somaliland, differing in size and colour, are recognized (see HUNTING-DOG). Nearly related to the hunting-dog are the dholes or wild dogs of Asia, as represented by the Central Asian *Cyan primaevus* and the Indo-Malay *C. javanicus*. They have, however, five front-toes, but lack the last lower molar; while they agree with *Lycaon* and *Speothos* in that the heel of the lower sectorial tooth has only a single compressed cutting cusp, in place of a large outer and a smaller inner cusp as in *Canis*. Dholes are whole-coloured animals, with short heads; and hunt in packs. The bush-dog (*Speothos*, or *Icticyon venaticus*) of Guiana is a small, short-legged, short-tailed and short-haired species characterized by the molars being only $\frac{2}{2}$ or $\frac{1}{2}$; the carnassial having no inner cusp. The long-haired raccoon-dog (*Nyctereutes procyonoides*) of Japan and China agrees essentially in everything but general appearance (which is strangely raccoon-like) with *Canis*. The typical group of the latter includes some of the largest members of the family, such as the true wolves of the northern parts of both Old and New Worlds (*C. lupus, &c.*), and the various breeds of the domestic dog (*C. familiaris*), the origin of which is still involved in obscurity. Some naturalists believe it to be a distinct species, descended from one that no longer exists in a wild state; others have sought to find its progenitors in some one of the wild or half-wild races, either of true dogs, wolves or jackals; while others again believe that it is derived from the mingling of two or more wild species or races. It is probably the earliest animal domesticated by man, and few if any other species have undergone such an extraordinary amount of variation in size, form and proportion of limbs, ears and tail, variations which have been perpetuated and increased by careful selective breeding (see DOG). The dingo or Australian dog is met with wild, and also as the domestic companion of the aboriginal race of the country, by whom it appears to have been originally introduced. It is nearly related to a half-wild dog inhabiting Java, and also to the pariah dogs of India and other eastern countries. Dogs were also in the possession of the natives of New Zealand and other islands of the Pacific, where no placental mammals exist naturally, on their discovery by Europeans in the 18th century. The slender-jawed *C. simensis* of Abyssinia and the South American *C. jubatus* and *C. antarcticus* are also generally placed in this group. On the other hand, the North American coyote (*C. latrans*), with its numerous subspecies, and the Old World jackals, such as the Indo-European *C. aureus* the Indian *C. pallipes*, and the African *C. lupaster, C. anthus, C. adustus, C. variegatus* and *C. mesomelas* (the black-backed jackal), although closely related to the wolves, have been placed in a separate group under the name of *Lupulus*. Again, *Thous* (or *Lycalopex*), is a group proposed for certain South American *Canidae*, locally known as foxes, and distinguished from all the foregoing by their fox-like aspect and longer tails, although with skulls of the thöoid type.

Among these are the bright-coloured colpeo, *C. magellanicus*, the darker *C. thous, C. azarae, C. griseus, C. cancrivorus* and *C. brasiliensis*. Some of these, such as *C. azarae* and *C. griseus*, show a further approximation to the fox in that the pupil of the eye forms a vertical slit. More distinct from all the preceding are the members of the alopecoid or vulpine section, which are unknown in South America. The characteristic feature of the skull has been already mentioned. In addition to this, reference may be made to the elliptical (in place of circular) pupil of the eye, and the general presence of ten (rarely eight) teats instead of a smaller number. The typical groups constituting the subgenus (or genus) *Vulpes*, is represented by numerous species and races spread over the Old World and North America. Foremost among these is the European fox (*C. vulpes*—otherwise *Vulpes alopex*, or *V. vulpes*), represented in the Himalaya by the variety *C. v. montanus* and in North Africa by *C. v. niloticus*, while the North American *C. pennsylvanicus* or *fulvus*, can scarcely be regarded as more than a local race. On the other hand, the Asiatic *C. bengalensis* and *C. corsac*, and the North American *C. velox* (kit-fox) are smaller and perfectly distinct species. From all these the North American *C. cinereo-argentatus* (grey fox) and *C. littoralis* are distinguished by having a fringe of stiff hairs in the tail, whence they are separated as *Urocyon*. Again, the Arctic fox (*C. lagopus*), of which there is a blue and a white phase, has the tail very full and bushy and the soles of the feet thickly haired, and has hence been distinguished as *Leucocyon*. Lastly, we have the elegant little African foxes known as fennecs (*Fennecus*), such as *C. zerda* and *C. famelicus* of the north, and the southern *C. chama*, all pale-coloured animals, with enormously long ears, and correspondingly inflated auditory bullae to the skull (see Wolf, Jackal, Fox).

Whatever differences of opinion may obtain among naturalists as to the propriety of separating generically the foxes from the wolves and dogs, there can be none as to the claim of the long-eared fox (*Otocyon megalotis*) of south and east Africa to represent a genus by itself. In this animal the dental formula is i. $\frac{3}{3}$, c. $\frac{1}{1}$, p. $\frac{4}{4}$, m. $\frac{3 \text{ or } 4}{4}$; total 46 or 48. The molar teeth being in excess of almost all other placental mammals with a differentiated series of teeth. They have the same general characters as in *Canis*, with very pointed cusps. The lower sectorial shows little of the typical character, having five cusps on the crown-surface; these can, however, be identified as the inner tubercle, the two greatly reduced and obliquely placed lobes of the blade, and two cusps on the heel. The skull generally resembles that of the smaller foxes, particularly the fennecs. The auditory bullae are very large. The hinder edge of the lower jaw has a peculiar form, owing to the great development of an expanded, compressed and somewhat inverted subangular process. Vertebrae: C. 7, D. 13, L. 7, S. 3, Ca. 22. Ears very large. Limbs rather long, with the normal number of toes. The two parietal ridges on the skull remain widely separated, so that no sagittal crest is formed. The animal is somewhat smaller than an ordinary fox. In the year 1880 Professor Huxley suggested that in the long-eared fox we have an animal nearly representing the stock from which have been evolved all the other representatives of the dog and fox tribe. One of the main grounds for arriving at this conclusion was the fact that this animal has very generally four true molars in each jaw, and always that number in the lower jaw; whereas three is the maximum number of these teeth to be met with in nearly all placental mammals, other than whales, manatis, armadillos and certain others. The additional molars in *Otocyon* were regarded as survivals from a primitive type when a larger number was the rule. Palaeontology has, however, made great strides since 1880, and the idea that the earlier mammals had more teeth than their descendants has not only received no confirmation, but has been practically disproved. Consequently Miss Albertina Carlsson had a comparatively easy task (in a paper published in the *Zoologisches Jahrbuch* for 1905) in demonstrating that the long-eared fox is a specialized, and to some extent degraded, form rather than a primitive type. This, however, is not all, for the lady points out that, as was suggested years previously by the present writer, the creature is really the descendant of the fossil *Canis curvipalatus* of northern India. This is a circumstance of considerable interest from a distributional point of view, as affording one more instance of the intimate relationship between the Tertiary mammalian fauna of India and the existing mammals of Africa.

In regard to the members of the dog-tribe as a whole, it may be stated that they are generally sociable animals, hunting their prey in packs. Many species burrow in the ground; none habitually climb trees. Though mostly carnivorous, feeding chiefly on animals they have chased and killed themselves, many, especially among the smaller species, eat garbage, carrion, insects, and also fruit, berries and other vegetable substances. The upper surface of the tail of the fox has a gland covered with coarse straight hair. This gland, which emits an aromatic odour, is found in all *Canidae*, with possibly the exception of *Lycaon pictus*. Although the bases of the hair covering the gland are usually almost white, the tips are always black; this colour being generally extended to the surrounding hairs, and often forming dark bars on the buttocks. The dark spot on the back of the tail is particularly conspicuous, notably in such widely separated species as the wolves, Azara's dog and the fennec.

Although its existing representatives are very different, the bear-family or *Ursidae*, as will

be more fully mentioned in the sequel, was in past times intimately connected with the *Canidae*. In common with the next two families, the modern *Ursidae* are characterized by the very small tympanic bulla, and the broad paroccipital process, which is, however, independent of the bulla. The feet are more or less completely plantigrade and five-toed. The intestine has neither duodeno jejunal flexure nor a caecum; the prostate gland is rudimentary; but glands occur in the vasa deferentia; and the penial bone is cylindrical. As distinctive characteristics of the *Ursidae*, may be mentioned the presence of an alisphenoid canal on the base of the skull; the general absence of a perforation on the inner side of the lower end of the humerus; the presence of two pairs of upper and three of lower molars, which are mostly elongated and low-cusped; and the non-cutting character and fore-and-aft shortening of the upper sectorial, which has no inner root and one inner cusp (fig. I, III.). Anal glands are apparently wanting. The short tail, bulky build, completely plantigrade feet and clumsy gait are features eminently characteristic of the bears.

Bear tribe.

The great majority of existing bears may be included in the typical genus *Ursus*, of which, in this wide sense, the leading characteristics will be as follows. The dentition is i. $\frac{3}{3}$, c. $\frac{1}{1}$, p. $\frac{4}{4}$, m. $\frac{2}{3}$ = 42; but the three anterior premolars, above and below, are one-rooted, rudimentary and frequently wanting. Usually the first (placed close to the canine) is present, and after a considerable interval the third, which is situated close to the other teeth of the cheek-series. The fourth (upper sectorial) differs essentially from the corresponding tooth of other Carnivora in that the inner lobe is not supported by a distinct root; its sectorial characters being very slightly marked. The crowns of both true molars are longer than broad, with flattened, tuberculated, grinding surfaces; the second having a large backward prolongation or heel. The lower sectorial has a small and indistinct blade and greatly developed tubercular heel; the second molar is of about the same length, but with a broader and more flattened tubercular crown; while the third is smaller. The milk-teeth are comparatively small, and shed at an early age. The skull is more or less elongated, with the orbits small and incomplete behind, and the palate prolonged considerably behind the last molar. Vertebrae: C. 7, D. 14, L. 6, S. 5, Ca. 8-10. Body heavy. Feet broad, completely plantigrade; the five toes on each well developed, and armed with long compressed and moderately curved, non-retractile claws, the soles being generally naked. Tail very short. Ears moderate, erect, rounded, hairy. Fur generally long, soft and shaggy.

Bears are animals of considerable bulk, and include among them the largest members of the order. Though the species are not numerous, they are widely spread over the earth, although absent from Africa south of the Sahara and Australasia. As a rule, they are omnivorous, or vegetable feeders, even the polar bear, which subsists for most of the year on flesh and fish, eating grass in summer. On the other hand, many of the brown bears live largely on salmon in summer. Among the various species the white polar bear of the Arctic regions, *Ursus (Thalassarctus) maritimus*, differs from the rest by its small and low head, small, narrow and simple molars, and the presence of a certain amount of hair on the soles of the feet. The typical group of the genus is represented by the brown bear (*U. arctus*) of Europe and Asia, of which there are many local races, such as the Syrian *U. a. syriacus*, the Himalayan *U. a. isabellinus*, the North Asiatic *U. a. collaris*, and the nearly allied Kamchadale race, which is of great size. In Alaska the group is represented by huge bears, which can scarcely claim specific distinctness from *U. arctus*; and if these are ranked only as races, it is practically impossible to regard the Rocky Mountain grizzly bear (*U. horribilis*) as of higher rank, although it naturally differs more from the Asiatic animal. On the other hand, the small and light-coloured *U. pruinosus* of Tibet may be allowed specific rank. More distinct is the North American black bear *U. americanus*, and its white relative *U. kermodei* of British Columbia; and perhaps we should affiliate to this group the Himalayan and Japanese black bears (*U. torquatus* and *U. japonicus*). Very distinct is the small Malay sun-bear *U. (Helarctus) malayanus*, characterized by its short, smooth fur, extensile tongue, short and wide head, and broad molars. Finally, the spectacled bear of the Andes, *U. (Tremarctus) ornatus*, which is also a broad-skulled black species, differs from all the rest in having a perforation, or foramen, on the inner side of the lower end of the humerus. A second genus, *Melursus*, represented by the Indian sloth-bear (*M. ursinus*), differs from the preceding in having only two pairs of upper incisors, the small size of the cheek-teeth, and the extensile lips. Ants, white-ants, fruits and honey form the chief food of this shaggy black species,—-a diet which accounts for its feeble dentition (see BEAR).

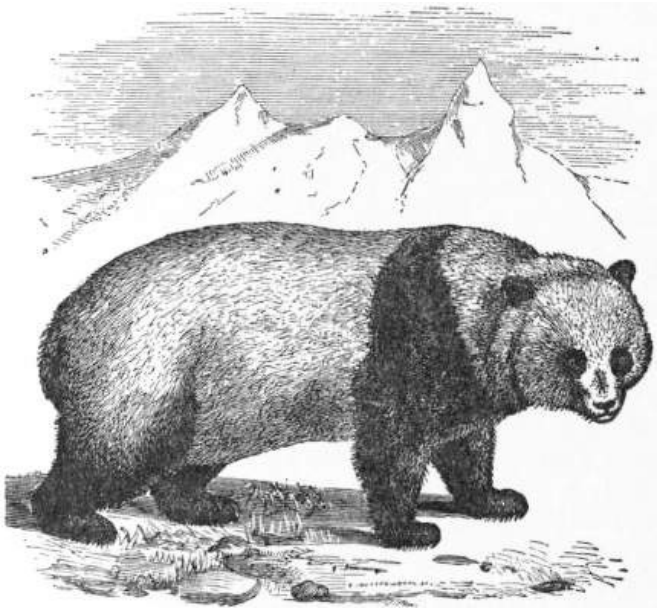

FIG. 6.—The Parti-coloured Bear, or Giant Panda (*Aeluropus melanoleucus*).

The parti-coloured bear or giant panda (*Aeluropus melanoleucus*, fig. 6) of eastern Tibet and north-west China forms in some degree a connecting link between the bears and the true panda, although placed by Professor E.R. Lankester in the same family as the latter. In the number of the teeth, and to some extent in the character of the molars, as well as in the abbreviated tail, *Aeluropus* resembles the bears, but in the structure of the sectorial tooth, the presence of an extra radial carpal bone, and the osteology generally, it is more like the panda. In the absence of an alisphenoid canal to the skull it differs both from the latter and the bears, and thereby resembles the raccoons; while in having a perforation at the lower end of the humerus, it agrees with the spectacled bear, the panda and raccoons. The dentition is i. ⅗, c. ⅟₁, p. ⅘, m. ⅔; total 40; premolars increasing in size from first to last, and two-rooted except the first; the first upper molar with quadrate crown, broader than long; and the second larger than the first. Skull with the zygomatic arches and sagittal crest immensely developed, ascending branch of lower jaw very high, giving great space for attachment of temporal muscle, and facial portion short. Bony palate not extending behind the last molar. No alisphenoid canal. Feet bear-like, but soles more hairy, and perhaps less completely plantigrade. Fur long and thick; and tail extremely short. Humerus with a perforation on the inner side of the lower end; a very large extra radial carpal bone. The colour of this strange animal is black and white (fig. 6).

With the panda (*Aelurus fulgens*) we reach an undoubted representative of the *Procyonidae*, or raccoon tribe, differing, however, from all the rest except the doubtful *Aeluropus*, in its Asiatic habitat. If the latter be included, the family may be defined as follows. Molars ⅗, except in *Aeluropus*, with blunt or sharp cusps; no alisphenoid canal, except in *Aelurus*; humerus generally with a foramen; feet plantigrade; tail, except in *Aeluropus*, long and generally ringed.

In the panda the dentition is i. ⅗, c. ⅟₁, p. ¾, m. ⅖; total 38; the first lower molar being minute and deciduous, and the upper molars broad with numerous and complicated cusps. Vertebrae: C. 7, D. 14, L. 6, S. 3, Ca. 18. Skull high and compressed, with an alisphenoid canal, a short facial portion, and the ascending branch of the lower jaw, as in *Aeluropus*, very tall. Face cat-like, with moderate, erect, pointed ears. Claws blunt. Tail cylindrical and ringed. Fur long and thick. Extra radial carpal bone moderate. The panda is a bright golden red animal, with black under-parts, ranging from the eastern Himalaya to north-western China, where it is represented by a distinct race. Fossil species occur in the later Tertiary deposits of Europe (see PANDA).

The raccoons (*Procyon*) are the first and typical representatives of the American section of the family, in which an alisphenoid canal is always wanting. In this genus the dentition is i. ⅗, c. ⅟₁, p. ⅘, m. ⅖; total 40; the upper molars being broad and tuberculated; the upper sectorial (like that of *Aeluropus* and *Aelurus*) having three outer cusps and a broad bicuspid inner lobe, giving an almost quadrate form to the crown. First upper molar with a large tuberculated crown, rather broader than long; second considerably smaller, with transversely oblong crown. Lower sectorial (first molar) with an extremely small and ill-defined blade, placed transversely in front, and a large inner tubercle and heel; second molar as long as the first, but narrower behind, with five obtuse cusps. Vertebrae: C. 7, D. 14, L. 6, S. 3, Ca. 16-20. Body stout. Head broad behind, but with a pointed muzzle. In walking the entire sole not applied to the ground, as it is when the animal is standing. Toes, especially of the fore-foot, very free, and capable of being spread wide apart; claws compressed, curved and pointed.

Tail moderately long, cylindrical, thickly covered with hair, ringed, non-prehensile. Fur long, thick and soft. The common raccoon (*Procyon lotor*) of North America is the type of this genus; it is replaced in South America by *P. cancrivorus* (see RACCOON). The cacomistles (*Bassariscus*) are nearly allied to *Procyon*, but of more slender and elegant proportions, with sharper nose, longer tail, and more digitigrade feet, and teeth smaller and more sharply cusped. The typical *B. astuta* is from the southern parts of the United States and Mexico, while *B. (Wagneria) annulata* is Mexican and Central American.

The name *Bassaricyon* has been given to a distinct modification of the procyonine type of which at present two species are known, one from Costa Rica and the other from Ecuador respectively, named *B. gabbi* and *B. alleni*. They much resemble the kinkajou in external appearance, but the skull and teeth are more like those of *Procyon* and *Nasua*. In the coatis, *Nasua*, the dentition is as in *Procyon*, but the upper canines are larger and more strongly compressed, and the molars smaller; while the facial portion of the skull is more elongated and narrow. Vertebrae: C. 7, D. 14, L. 6, S. 3, Ca. 22-23. Body elongated and rather compressed. Nose prolonged into a somewhat upturned, obliquely-truncated, mobile snout. Tail long, non-prehensile, tapering and ringed. Coatis, or coati-mundis, live in small troops of eight to twenty, are chiefly arboreal, and feed on fruits, young birds, eggs, insects, &c. The two best-known species are *N. narica* of Mexico and Central America, and *N. rufa* of South America from Surinam to Paraguay (see COATI).

In the kinkajou (*q.v.*), an animal long known as *Cercoleptes caudivolvulus*, but whose designation it has been proposed to change to the unclassical *Potos flavus*, the dentition is i. ⅔, c. 1/1, p. ⅔, m. 2/2 = 36. Molars with low flat crowns, very obscurely tuberculated. Skull short and rounded, with flat upper surface. Vertebrae: C. 7, D. 14, L. 6, S. 3, Ca. 26-28. Clavicles present, but in a very rudimentary condition. Head broad and round. Ears short. Body long and musteline. Limbs short. Tail long, tapering and prehensile. Fur short and soft. Tongue long and very extensile.

Weasel tribe.

The last existing family of the land Carnivora is that typified by the martens and weasels, and hence known as the *Mustelidae*. The group is characterized by the absence of an alisphenoid canal in the skull, the reduction of the molars to ½ or even 1/1, the medium size of the sectorial tooth in each jaw, the absence or presence of a perforation in the humerus, and the presence of anal glands. The family is cosmopolitan in distribution, with the exception of Australasia and Madagascar.

The first section of the family, forming the subfamily *Mustelinae*, is typically characterized by the short and partially webbed toes, furnished with short, compressed, sharp, curved and often partially retractile claws. The upper molar is always of moderate size and elongated in the transverse direction. In the martens and sables (*Mustela*) the dentition is i. ⅔, c. 1/1, p. ⅘, m. ½; total 38; the upper sectorial having its inner lobe close to the anterior edge of the tooth; and the upper molar being nearly as large as the sectorial. Lower sectorial with small inner tubercle. Vertebrae: C. 7, D. 14, L. 6, S. 3, Ca. 18-23. Body long and slender. Limbs short, partially digitigrade, with the feet rounded and the toes short, with compressed, acute, semi-retractile claws. Tail moderate or long, more or less bushy. One species, *M. martes*, the pine-marten, is British; the remainder inhabit the northern regions of Europe, Asia and America. Many of the species, as the sable (*M. zibellina*), yield fur of great value (see MARTEN).

The dentition of *Putorius* differs from that of *Mustela* chiefly in the absence of the anterior premolars of both jaws. The teeth are more sharply cusped, and the lower sectorial wants the inner tubercle. External characters generally similar to those of the martens, but the body longer and more slender, and the limbs even shorter. All the species are small animals, of active, bloodthirsty and courageous disposition, living chiefly on birds and small mammals, and rather terrestrial than arboreal, dwelling among rocks, stones and out-buildings. Some of the species, as the stoat or ermine (*P. ermineus*), inhabiting cold climates, undergo a seasonal change of colour, being brown in summer and white in winter, though the change does not affect the whole of the fur, the end of the tail remaining black in all seasons. This is a large genus, having a very extensive geographical range throughout the Old and New Worlds, and includes the animals commonly known as weasels, polecats, ferrets and minks (*q.v.*).

In the glutton (*Gulo luscus*) the dentition is i. ⅔, c. 1/1, p. ⅘, m. ½; total 38; the crowns of the teeth being stout, and the upper molar much smaller than the sectorial. Lower sectorial large, with small heel and no inner tubercle. The dentition, though really but a modification of that of the weasels, presents a general resemblance to that of hyena. Vertebrae: C. 7, D. 15, L. 5, S. 3, Ca. 15. Body and limbs stoutly made; feet large and powerful, subplantigrade, with large, compressed, much-curved and sharp-pointed claws. Soles of the feet (except the pads of the toes) covered with thick bristly hairs. Ears very small, nearly concealed by the fur. Eyes small. Tail short, thick and bushy. Fur full, long and rather coarse. The one species,

the wolverine or glutton, is an inhabitant of the forest regions of northern Europe, Asia and America, and much resembles a small bear in appearance. It is a very powerful animal for its size, climbs trees and lives on squirrels, hares, beavers, reindeer, and is said to attack even horses and cows.

The South American grison and tayra represent the genus *Galictis*, in which the dentition is i. ⅔, c. ⅓, p. ⅔, m. ½; total 34; the molars being small but stout, and the upper sectorial with the inner lobe near the middle of the inner border. Lower sectorial with heel small, and inner tubercle small or absent. Body long; limbs short, with non-retractile claws and naked soles. Head broad and depressed. Tail of moderate length. The species include the grison (*G. vittata*), *G. allamandi*, and the tayra (*G. barbara*); the last, which extends northward into Central America, being sub-generically separated as *Galera*. Nearly allied to these is the smaller and more weasel-like *Lyncodon patagonicus*. All the foregoing South American carnivores display a marked tendency to being darker on the lower than on the upper surface. The same feature obtains in the African and Indian ratels, or honey-badgers, constituting the genus *Mellivora*, distinguished from all the other members of the family by having only a single pair of lower molars, the dentition being i. ⅔, c. ⅓, p. ⅔, m. ⅓; total 32; the upper sectorial is large, with its inner cusp at the anterior end of the blade, the molar much smaller and transversely extended, having a small outer and a larger rounded inner lobe. Heel of lower sectorial very small, scarcely one-fourth of the whole length of the tooth, with but one cusp. Vertebrae: C. 7, D. 14, L. 4, S. 4, Ca. 15. Body stout, depressed; limbs short, strong; head depressed; nose rather pointed; ears rudimentary. Tail short. *M. indica*, from India, and *M. ratel*, from south and west Africa, have nearly the same general appearance and size, being rather larger than a common badger, and may be only races of the same species. Their coloration is peculiar, all the upper surface of the body, head and tail being ash-grey, while the lower parts, separated by a distinct longitudinal boundary line, are black. They live chiefly on the ground, into which they burrow, but can also climb trees. They feed on small mammals, birds, reptiles and insects, and are partial to honey.

In the Indo-Malay ferret-badger, *Helictis*, the dentition is i. ⅔, c. ⅓, p. ⅘, m. ½; total 38. Upper sectorial with a large bicusped inner lobe, molar smaller, wider transversely than in the antero-posterior direction. Lower sectorial with heel about one-third the length of the tooth. Skull elongated, rather narrow and depressed; facial portion especially narrow; infraorbital foramen very large. Head rather small and produced in front, with an elongated, obliquely truncated, naked snout and small ears. Body elongated, limbs short. Tail short or moderate, bushy. Several species are described, such as *H. orientalis, moschata, nipalensis*, and *subaurantiaca*, from eastern Asia, all small animals, climbing trees with agility and living on fruits and berries as well as on small mammals and birds.

The African striped zorilles, or *Muis-honds* (*Ictonyx*), have a dental formula of i. ⅔, c. ⅓, p. ⅔, m. ½; total 34; the teeth much resembling those of the polecats, and the upper molar being smaller than the sectorial, and narrow from before backwards. Lower sectorial with a smalt narrow heel and distinct inner tubercle. General form of body musteline. Limbs short, fore-feet large and broad, with five stout, nearly straight, blunt and non-retractile claws, of which the first and fifth are considerably shorter than the others. Tail moderate, with longer hairs towards the end, giving it a bushy appearance. Hair generally long and loose. The best-known species of this genus, the Cape polecat, *Ictonyx capensis* (or *Zorilla zorilla*), is about the size of a polecat, but conspicuous by its broad, longitudinal bands of dark-brown, alternating with white. Its odour is said to be as offensive as that of the American skunks. From the Cape of Good Hope it ranges as far north as Senegal. Another species, *I. lybicus*, from Sennaar, has been described. The small striped polecat of southern Africa, *Poecilogale albinucha*, represents a genus by itself, and is a shorter-haired animal.

The skunks of America are very similar to the two genera last mentioned in their colouring, and with the latter serve to form a connecting link with the more typical *Mustelinae*, and the badger group, or *Melinae*, in which the feet are elongated, with straight toes and non-retractile, slightly curved, subcompressed, blunt claws, especially large on the fore-foot. In all cases the upper molar is larger than the sectorial, and in the more typical genera is much longer than broad.

In the North American skunks of the genus *Mephitis* the dentition is i. ⅔, c. ⅓, p. ⅔, m. ½; total 34. Upper molar larger than the sectorial, subquadrate, rather broader than long; lower sectorial with heel less than half the length of the whole tooth. Bony palate terminating posteriorly opposite the hinder border of the last molar. Facial portion of skull short and somewhat truncated in front. Vertebrae: C. 7, D. 16, L. 6, S. 2, Ca. 21. Head small. Body elongated. Limbs moderate, subplantigrade. Ears short and rounded. Tail long, abundantly clothed with long fine hair. Anal glands largely developed; their secretion, which can be discharged at the will of the animal, has an intolerably offensive odour and has rendered skunks proverbial. The South American species, which have only two upper premolars, and differ in some other characters, are generically separated under the name of *Conepatus*;

while the small North American arboreal skunks are distinguished as *Spilogale* (see SKUNK).

Badger tribe.

Passing on to the more typical members of the badger group, we have first the genus *Arctonyx*, with the dentition i. ⅔, c. 1/1, p. 4/4, m. ½; total 38. The incisor line is curved, the outer teeth being placed posteriorly to the others: lower incisors inclined forwards. First premolars often rudimentary or absent; upper molar much larger than the sectorial, longer in the antero-posterior direction than broad; lower sectorial with a very large, low, tuberculated heel. Skull elongated and depressed; face long, narrow and concave above; bony palate extending as far backwards as the level of the glenoid fossa; and palatal bones dilated. Suborbital foramina very large. Vertebrae: C. 7, D. 16, L. 4, S. 4, Ca. 20. Snout long, naked, mobile and truncated, with large terminal nostrils, much like those of a pig. Eyes small; ears very small and rounded. Body compressed, rather than depressed. Limbs of moderate length, and partially digitigrade in walking. Tail moderate, tapering. A full soft under-fur, with longer bristly hairs interspersed. The longest-known species is *A. collaris*, the *bhalu-soor* (bear-pig) or *bali-soor* (sand-pig) of the natives of the mountains of north-eastern India, Burma and Borneo. It is rather larger than the badger, higher on its legs, and very pig-like in general aspect, of a light grey colour, with flesh-coloured snout and feet; nocturnal and omnivorous. Other species or local varieties have been described from north China and Burma.

In the genus *Mydaus* the dentition is as the last, but the cusps of the teeth are more acutely pointed. Skull elongated, face narrow and produced. Suborbital foramen small, and the palate, as in all the succeeding genera of this group, produced backwards about midway between the last molar and the glenoid fossa. Vertebrae: C. 7, D. 14-15, L. 6-5, S. 3, Ca. 12. Head pointed in front; snout produced, mobile, obliquely truncated, the nostrils being inferior. Limbs rather short and stout. Tail extremely short, but clothed with rather long bushy hair. Anal glands largely developed, and emitting an odour like that of the skunks. One species, *M. meliceps*, the teledu, a small burrowing animal from the mountains of Java, at an elevation of 7000 or more ft. above the sea-level; and a second (*M. marchei*) from the Philippines.

In the true badger of the genus *Meles* the dentition is i. ⅔, c. 1/1, p. 4/4, m. ½; total 38. The first premolar in both jaws is extremely minute and often deciduous; while the upper molar is much larger than the sectorial, subquadrate, and as broad as long. Lower sectorial with a broad, low, tuberculated heel, more than half the length of the whole tooth. The postglenoid process of the skull so strongly developed, and the glenoid fossa so deep, that the condyle of the lower jaw is firmly held in place after the soft parts are removed. Vertebrae: C. 7, D. 15, L. 5, S, 3, Ca. 18. Muzzle pointed. Ears very short. Body stout, broad. Limbs short, strong, subplantigrade. Tail short. Typified by the common badger (*M. taxus* or *M. meles*) of Europe and northern Asia, still found in many parts of England, where it lives in woods, is nocturnal, burrowing and very omnivorous, feeding on mice, reptiles, insects, fruit, acorns and roots. Other nearly allied species, *M. leucurus* and *M. chinensis*, are found in continental Asia, and *M. anakuma* in Japan.

In the nearly-allied genus *Taxidea* the dental formula is as in *Meles*, except that the rudimentary anterior premolars appear to be always wanting in the upper jaw. The upper sectorial is much larger in proportion to the other teeth; and the upper molar about the same size as the sectorial, triangular, with the apex turned backwards. Heel of lower sectorial less than half the length of the tooth. Skull very wide in the occipital region; the lambdoidal crest greatly developed, and the sagittal but slightly, contrary to what obtains in *Meles*. Vertebrae: C. 7. D. 15. L. 5, S. 3, Ca. (?). Body stoutly built and depressed. Tail short. The animals of this genus are peculiar to North America, where they represent the badgers of the Old World, resembling them much in appearance and habits. *T. americana* is the common American badger of the United States, *T. berlandieri*, the Mexican badger, being a local variety.

Otter tribe.

The third and last subfamily is that of the otters, or *Lutrinae*, in which the feet (with the exception of the hind pair in the sea-otter) are short and rounded, with the toes webbed, and the claws small, curved and blunt. The head is broad and much depressed. The upper posterior cheek-teeth are large and quadrate. The kidneys are conglomerate. Habits aquatic.

In the true otter of the genus *Lutra* the dentition is i. ⅔, c. 1/1, p. 4/3, m. ½; total 36. Upper sectorial with a trenchant tricusped blade, and a very large inner lobe, hollowed on the free surface, with a raised sharp edge, extending along two-thirds or more of the length of the blade. Upper molar large, with a quadricuspidate crown, broader than long. Skull broad and depressed, contracted immediately behind the orbits; with the facial portion very short and the brain-case large. Vertebrae: C. 7, D. 14-15, L. 6-5, S. 3, Ca. 20-26. Body very long. Ears short and rounded. Limbs short. Feet completely webbed, with well-developed claws on all the toes. Tail long, thick at the base and tapering, rather depressed. Fur short and close.

Otters are more or less aquatic, living on the margins of rivers, lakes, and in some cases

the sea; are expert divers and swimmers, and feed chiefly on fish. They have an extensive geographical range, and so much resemble each other in outward appearance, especially in the nearly uniform brown colouring, that in some cases the species are by no means well-defined. The Brazilian otter (*L. brasiliensis*) is a very large species from Brazil, Demerara and Surinam, with a prominent ridge along each lateral margin of the tail. In two small species the feet are only slightly webbed; claws exceedingly small or altogether wanting on some of the toes; the first upper premolar very small, sometimes wanting; and the molars very broad and massive. The species in question are *L. inunguis* of South Africa, and *L. leptonyx* or *cinerea* of India, Java and Sumatra, and have been separated as a distinct genus, Aonyx.

The sea-otter, *Latax* (or *Enhydra*) *lutra*, with a dentition of i. $\frac{3}{2}$, c. $\frac{1}{1}$, p. $\frac{3}{3}$, m. $\frac{1}{2}$, total 32, differs from other Carnivora in having but two incisors on each side of the lower jaw, the one corresponding to the first (very small in the true otters) being absent. Though the molar teeth generally resemble those of *Lutra* in their proportions, they differ in the exceeding roundness and massiveness of their crowns and bluntness of their cusps. Feet webbed; fore-feet short, with five subequal toes, with short compressed claws; hind-feet very large, depressed and fin-like, their phalanges flattened as in seals. The fifth toe the longest and stoutest, the rest gradually diminishing in size to the first, all with moderate claws. Tail moderate, cylindrical (see Otter).

II. Pinnipedia

The second suborder is formed by the seals, walruses and eared seals, which differ from the rest of the Carnivora mainly in the limbs being modified for aquatic progression; the two upper segments being very short and partially enveloped in the general integument of the body, while the third, especially in the hind extremities, is elongated, expanded and webbed. There are always five well-developed digits on each limb. In the hind-limb the two marginal digits (first and fifth) are stouter and generally larger than the others. The teeth also differ from those of the more typical Carnivora. The incisors are always fewer than $\frac{3}{3}$. The chsek series consists generally of four premolars and one molar of uniform characters, with never more than two roots, and with conical, more or less compressed, pointed crowns, which may have accessory cusps, placed before or behind the principal one, but are never broad and tuberculated. The milk-teeth are small, simple and shed or absorbed at an early age, usually either before or within a few days after birth. The brain is relatively large, the cerebral hemispheres broad in proportion to their length, and with numerous and complex convolutions. There is a very short caecum; the kidneys are divided into numerous distinct lobules. There are no Cowper's glands. Teats two or four, abdominal. No clavicles. Tail always short. Eyes large and exposed, with flat cornea. The nostrils close by the elasticity of their walls, and are opened at will by muscular action.

The members of this group are aquatic, spending the greater part of their time in the water, swimming and diving with great facility, feeding mainly on fish, crustaceans and other marine animals, and progressing on land with difficulty, but always coming on shore for the purpose of bringing forth their young. They are generally marine, but occasionally ascend large rivers, and some inhabit inland seas and lakes, as the Caspian and Baikal. Though not numerous in species, they are widely distributed over the world, but occur most abundantly on the coasts of lands situated in cold and temperate zones.

As mentioned in the article Creodonta, the true seals (*Phocidae*), together with the walruses, may be directly descended from the primitive Creodont Carnivora. The eared seals, on the other hand, show signs of affinity with the bears; but as they are of earlier geological age than the latter, they cannot be derived from that group.

Seals.

The true seals (family *Phocidae*) are the most completely adapted for aquatic life of all the Pinnipedia. When on land the hind-limbs are extended backwards and take no part in progression, which is effected by a series of jumping movements produced by the muscles of the trunk, in some species aided by the fore-limbs. The soles of the feet are hairy. There is no pinna to the ear, and no scrotum, the testes being abdominal. The upper incisors have simple, pointed crowns, and vary in number in the different groups. All have well developed canines and $\frac{5}{5}$ teeth of the cheek series. In those species of which the milk-dentition is known, there are three milk molars, which precede the second, third, and fourth permanent molars; the dentition is therefore p. $\frac{4}{4}$, m. $\frac{1}{1}$, the first premolar having as usual no milk predecessor. The skull has no post-orbital process and no alisphenoid canal. The fur is stiff and adpressed, without woolly under-fur.

In the typical group, or subfamily *Phocinae*, the incisors are $\frac{3}{2}$. All the feet have five well-developed claws with the toes on the hind-feet subequal, the first and fifth not greatly exceeding the others in length, the interdigital membrane not extending beyond them. In the

genus *Halichoerus* the dentition is i. $\frac{3}{2}$, c. $\frac{1}{1}$, p. $\frac{4}{4}$, m. $\frac{1}{1}$; total 34. Molars with large, simple, conical, recurved, slightly compressed crowns, having sharp anterior and posterior edges, but without accessory cusps, except sometimes the two hinder ones of the lower jaw. With the exception of the last one or two in the upper jaw and the last in the lower jaw, all are single-rooted. Vertebrae: C. 7, D. 15, L. 5, S. 4, Ca. 14. Includes only one species *H. grypus*, the grey seal of the coasts or Scandinavia and the British Isles.

In *Phoca* the dental formula is as in the last, but the teeth are smaller and more pointed. Molars with two roots (except the first in each jaw). Crowns with accessory cusps. Vertebrae: C. 7, D. 14-15, L. 5, S. 4, Ca. 11-14. Head round and short. Fore-feet short with five strong, subcompressed, slightly curved, subequal, rather sharp claws. On the hind-feet the claws much narrower and less curved. The species of this genus are widely distributed throughout the northern hemisphere, and include *P. barbata*, the bearded seal; *P. groenlandica*, the Greenland seal; *P. vitulina*, the common seal; *P. hispida*, the ringed seal of the north Atlantic; *P. caspica*, from the Caspian and Aral Seas; and *P. sibirica*, from Lake Baikal. (See SEAL).

The members of the second subfamily, *Monachinae*, have incisors $\frac{2}{2}$; and the molars two-rooted, except the first. On the hind-feet the first and fifth toes greatly exceeding the others in length, with nails rudimentary or absent. In the genus *Monachus*, the dentition is i. $\frac{2}{2}$, c. $\frac{1}{1}$, p. $\frac{4}{4}$, m. $\frac{1}{1}$; total 32. Crowns of molars strong, conical, compressed, hollowed on the inner side, with a strongly-marked lobed cingulum, especially on the inner side, and slightly developed accessory cusps before and behind. The first and last upper and the first lower molar smaller than the others. Vertebrae: C. 7, D. 15, L. 5, S. 2, Ca. 11. All the nails of both fore and hind feet very small and rudimentary. Represented by *M. albiventer*, the monk-seal of the Mediterranean and adjacent parts of the Atlantic, and the West Indian *M. tropicalis.*

The other genera of this section have the same dental formula, but are distinguished by the characters, of the cheek-teeth and the feet. They are all inhabitants of the shores of the southern hemisphere.

In *Ogmorhinus* all the teeth of the cheek-series have three distinct pointed cusps, deeply separated from each other, of which the middle or principal cusp is largest and slightly recurved; the other two are nearly equal in size, and have their tips directed towards the middle one. Skull much elongated. One species, *O. leptonyx*, the sea-leopard, widely distributed in the Antarctic and southern temperate seas. In *Lobodon* the molars have compressed elongated crowns, with a principal recurved cusp, rounded and somewhat bulbous at the apex, and one anterior, and one, two or three posterior distinct accessory cusps. One species, *L. carcinophagus*, the crab-eating seal. In the third genus, *Leptonychotes*, represented by *L. weddelli*, the molars are small, with simple, subcompressed, conical crowns, and a broad cingulum, but no distinct accessory cusps. Finally in the white seal (*Ommatophoca rossi*) all the teeth are very small, those of the cheek-series with pointed, recurved crowns, and small posterior and still less developed anterior accessory cusps. Orbits very large. Nails rudimentary on front and absent on hind-feet. The skull bears a considerable resemblance to that of the next subfamily.

The presence of two pairs of upper and one pair of lower incisors is characteristic of the members of the subfamily *Cystophorinae*, in which the teeth of the cheek-series are generally one-rooted. The nose of the males has an appendage capable of being inflated. First and fifth toes of hind-feet greatly exceeding the others in length, with prolonged cutaneous lobes, and rudimentary or no nails. In the typical genus *Cystophora* the dentition is i. $\frac{2}{1}$, c. $\frac{1}{1}$, p. $\frac{4}{4}$, m. $\frac{1}{1}$; total 30; the last molar having generally two distinct roots. Beneath the skin over the face of the male, and connected with the nostrils, is a sac capable of inflation, when it forms a kind of hood covering the upper part of the head. Nails present, though small on the hind-feet. Represented by *C. cristata*, the hooded or bladder-nosed seal of the Polar Seas. In *Macrorhinus* the dentition is numerically the same as in the last, but the molars are of simpler character and all one-rooted. All the teeth, except the canines, very small relatively to the size of the animal. Hind-feet without nails. Vertebrae: C. 7, D. 15, L. 5, S. 4, Ca. 11. Nose of adult male produced into a short tubular proboscis, ordinarily flaccid, but capable of dilatation and elongation under excitement. One species, *M. leoninus*, the elephant-seal, or “sea elephant” of the whalers, the largest of the whole family, attaining the length of nearly 20 ft. Formerly abundant in the Antarctic Seas, and also found on the coast of California.

The next family is that of the walruses, or *Odobaenidae*, the single generic representative of which is in some respects intermediate between the *Phocidae* and *Otariidae*, but has a completely aberrant dentition. Walruses have no external ears, as in the *Phocidae*; but when on land the hind-feet are turned forwards and used in progression, though less completely than in the *Otariidae*. The upper canines are developed into immense tusks, which descend a long distance below the lower jaw. All the other teeth, including the lower canines, are much alike, small, simple and one-rooted, the molars with flat crowns. The skull is without post-orbital process, but has an

Walrus

alisphenoid canal. In the young the dentition is i. ⅗, c. ⅕, p. and m. ⅝, but many of these teeth are, however, lost early or remain through life in a rudimentary state, concealed by the gums. The teeth which are usually developed functionally are i. ⅒, c. ⅕, p. ⅗, m. ⅚; total 18. Vertebrae: C. 7, D. 14, L. 6, S. 4, Ca. 9. Head round. Eyes rather small. Muzzle short and broad, with a group of long, very stiff, bristly whiskers on each side. The remainder of the hair-covering very short and closely pressed. Tail rudimentary. Fore-feet with subequal toes, carrying five minute flattened nails. Hind-feet with subequal toes, the fifth slightly the largest, with cutaneous lobes projecting beyond the ends as in *Otaria*; first and fifth with minute flattened nails; second, third and fourth with large, elongated, subcompressed pointed nails. The two species are *Odobaenus rosmarus*, of the Atlantic, and the closely allied *O. obesus*, of the Pacific. (See WALRUS.)

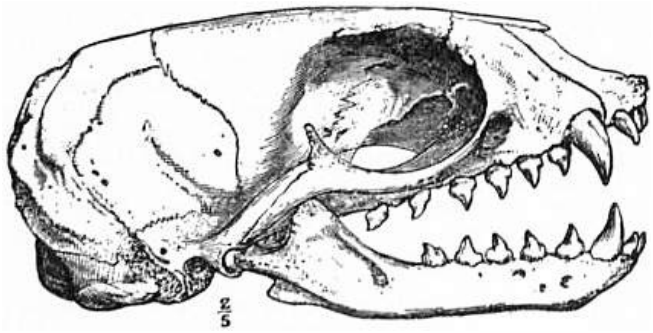

FIG. 7.—Skull and dentition of Australian Sea-Bear (*Otaria forsteri*).

The third and last family of the Pinnipedia, and thus of existing Carnivora, is the *Otariidae*, which includes the eared seals, or sea-lions and sea-bears. In all these animals, when on land, the hind-feet are turned forwards under the body, and aid in supporting and moving the trunk as in ordinary quadrupeds. There are small external ears. Testes suspended in a distinct external scrotum. Skull with post-orbital processes and alisphenoid canal. Soles of feet naked. By many naturalists these seals are arranged in a number of generic groups, but as the differences between them are not very great, they may all be included in the typical genus *Otaria*. The dental formula is i. ⅔, c. ⅕, p. ¾, m. 1 or ⅔; total 34 or 36. The first and second upper incisors are small, with the summits of their crowns divided by deep transverse grooves into an anterior and a posterior cusp of nearly equal height; the third large and canine-like. Canines large, conical, pointed, recurved. Molars and premolars usually ⅘, of which the second, third and fourth are preceded by milk-teeth shed a few days after birth; sometimes (as in fig. 7) a sixth upper molar (occasionally developed on one side and not the other); all with similar characters, generally single-rooted; crown moderate, compressed, pointed, with a single principal cusp, and sometimes a cingulum, and more or less developed anterior and posterior accessory cusps. Vertebrae: C. 7, D. 15, L. 5, S. 4, Ca. 9-10. Head rounded. Eyes large; ears small, narrow and pointed. Neck long. Skin of the feet extended far beyond the nails and ends of the digits, with a deeply-lobed margin. The nails small and often quite rudimentary, especially those of the first and fifth toes of both feet; the best-developed and most constant being the three middle claws of the hind-foot, which are elongated, compressed and curved.

Sea-lions

Sea-bears and sea-lions are widely distributed, especially in the temperate regions of both hemispheres, though absent from the coasts of the North Atlantic. They spend more of their time on shore, and range inland to greater distances than the true seals, especially at the breeding-time, though they are obliged to return to the water to seek their food. They are gregarious and polygamous, and the males usually much larger than the females. Some possess, in addition to the stiff, close, hairy covering common to the group, a fine, dense, woolly under-fur. The skins of these, when dressed and deprived of the longer harsh outer hairs, constitute the “sealskin” of commerce. The species include *O. stelleri*, the northern sea-lion, the largest of the genus, from the North Pacific, about 10 ft. in length; *O. jubata*, the southern sea-lion, from the Falkland Islands and Patagonia; *O. californiana*, from California; *O. ursina*, the sea-bear or fur-seal of the North Pacific, the skins of which are imported in immense numbers from the Pribiloff Islands; *O. antarctica* or *pusilla*, from the Cape of Good Hope; and *O. forsteri*, from Australia and various islands in the southern hemisphere. (See SEAL-FISHERIES.)

Little is known as to the past history of the sea-lions and sea-bears, but a skull has been obtained from the Miocene strata of Oregon, which Mr F.W. True states to be considerably larger than any existing sea-lion skull; its basal length when entire being probably about 20 in. The name *Pontoleon magnus* has been proposed for this fossil sea-lion, as the character of the skull and teeth do not agree precisely with those of any living member of the group. If, however, all the modern eared seals are included in the genus *Otaria*, there is apparently no

reason to exclude the fossil species.

Extinct Carnivora

Modern Carnivora are undoubtedly the descendants of the Creodonta (*q.v.*), an extinct early Tertiary suborder. It has been observed that as the Miocene is approached, some of these Carnivora Creodonta, or Primitiva, begin to assume more and more of the characteristics of the Carnivora Vera, till at last it is difficult to determine where the one group ends and the other commences. The creodont genera *Stypolophus* and *Proviverra* show some of these modern characters; but it is not till we reach the European Oligocene genus *Amphictis*, with the dental formula i. ⅗, c. ½, p. ⅘, m. ⅖, that we meet a type in which the fourth upper premolar and the first lower molar assume the truly sectorial character of the Carnivora Vera, while the teeth behind them are proportionally reduced in size. From the *Amphictidae* are probably descended the *Viverridae*, the connecting genus being the African *Nandinia*, which, as already mentioned, retains the imperfectly ossified bulla of the ancestral forms. In another direction, *Amphictis*, through the Old World Lower Pliocene genus *Ictitherium*, has given rise to the *Hyaenidae*. The *Felidae* have apparently an ancestral type in the creodont *Palaeonictis*, which has been regarded as the direct ancestor of the sabre-toothed cats, or *Machaerodontinae* (see Machaerodus); but it is possible that *Palaeonictis* may be off the direct line, and that the *Felidae* are sprung from *Amphictis*. Be this as it may, from another group of creodonts, represented by *Vulpavus* (*Miacis*), *Viverravus* (*Didymictis*), and *Uintacyon*, is probably derived the Oligocene *Cynodictis*, with a dental formula like that of *Canis* or *Cyon*, a perforation to the humerus, and an apparently undivided auditory bulla; and from *Cynodictis* the transition is easy to the *Canidae*. It should be mentioned, however, that there is a group of North American Oligocene dog-like animals, such as *Daphaenus*, *Protemnocyon*, and *Temnocyon*, which agree with *Cyon* in the shortness of the jaws, and with that genus and *Speothos* in the cutting-heel of the lower sectorial. Possibly these genera may be nearly related to *Cyon*. Other dog-like North American types are *Oligohinis*, *Enhydrocyon* and *Hyaenocyon*.

By means of the *Amphicyonidae*, as represented by the Middle Tertiary genera *Proamphicyon, Pseudamphicyon*, and *Amphicyon*, in which there were three upper molars, we have a transition from the *Cynodictis*-type to the bear-group; one of the later intermediate forms being the Lower Pliocene Old World *Hyaenarctus*, in which the two upper molars are squared and foreshadow those of *Ursus* itself. In some unknown manner *Hyaenarctus* appears to be related to *Aeluropus*. An allied type is found in *Arctotherium* of the South American Pleistocene.

By the loss of the third lower molar and certain modifications of the other teeth and skull, the Miocene genus *Plesictis* may be derived from *Cynodictis*, its dental formula being i. ⅗, c. 1/1, p. ⅘, m. 1 or ⅖. Now *Plesictis* is nothing more than a generalized representative of the *Mustelidae*. We have thus traced three out of the four modern arctoid families to the *Cynodictis*-type. The *Procyonidae*, or fourth family (apart from the Asiatic *Aelurus* and *Aeluropus*) are connected with the last-named genus through the North American Oligocene *Phlaeocyon*, which is stated to be in almost every respect intermediate between *Procyon* and *Cynodictis* while the living *Bassariscus* is stated to show closer signs of affinity with *Cynodictis* than with *Phlaeocyon*.

To deal with fossil representatives of living genera, or extinct genera nearly related to groups still existing, would here be impracticable. It may be stated, however, that aberrant groups like the otters are linked up with more normal types by means of extinct forms (in this particular instance by the Miocene *Potamotherium*), so that the gaps in the phylogeny of the Carnivora are comparatively few.

Literature.—The above article is based on that by Sir W.H. Flower in the 9th edition of this Encyclopaedia. The principal works on Carnivora are the following: W.H. Flower, “On the Value of the Base of the Cranium in the Classification of the Carnivora,” *Proc. Zool. Soc. London*, 1869; T.H. Huxley, “Cranial and Dental Characters of the Canidae,” *Proc. Zool. Soc. London*, 1880; St G. Mivart, “On the Classification and Distribution of the Aeluroidea ... and Arctoidea”, *Proc. Zool. Soc. London*, 1882 and 1885; E.R. Lankester, “On the Affinities of Aeluropus,” *Trans. Linn. Soc. London*, vol. viii. part iv., 1901; Miss A. Carlsson, “Über die systematische Stellung von Nandinia,” *Zool. Jahrb. Syst.*, vol. xiii., 1900, and “Ist Otocyon die Ausgangsform des Hundegeschlechts oder nicht?” op. cit. vol. xxii., 1905; J.L. Wortman and W.D. Matthew, “The Ancestry of Certain Members of the Canidae, Viverridae, and Procyonidae,” *Bull. Amer. Mus.*, vol. xii., 1899.

(R. L.*)

CARNOT, LAZARE HIPPOLYTE (1801-1888), French statesman, the second son of L.N.M. Carnot (*q.v.*), was born at Saint-Omer on the 6th of October 1801. Hippolyte Carnot lived at first in exile with his father, returning to France only in 1823. Unable then to enter active political life, he turned to literature and philosophy, publishing in 1828 a collection of *Chants helléniques* translated from the German of W. Müller, and in 1830 an *Exposé de la doctrine Saint-Simonienne*, and collaborating in the Saint-Simonian journal *Le Producteur*. He also paid several visits to England and travelled in other countries of Europe. In March 1839, after the dissolution of the chamber by Louis Philippe, he was elected deputy for Paris (re-elected in 1842 and in 1846), and sat in the group of the Radical Left, being one of the leaders of the party hostile to Louis Philippe. On the 24th of February 1848 he pronounced in favour of the republic. Lamartine chose him as minister of education in the provisional government, Carnot set to work to organize the primary school systems, proposing a law for obligatory and free primary instruction, and another for the secondary education of girls. But he declared himself against purely secular schools, holding that "the minister and the schoolmaster are the two columns on which rests the edifice of the republic." By this attitude he alienated both the Right and the Republicans of the Extreme Left, and was forced to resign on the 5th of July 1848. He was one of those who protested against the *coup d'état* of the 2nd of December 1851, but was not proscribed by Louis Napoleon. He refused to sit in the *Corps Législatif* until 1864, in order not to have to take the oath to the emperor. From 1864 to 1869 he was in the republican opposition, taking a very active part. He was defeated at the election of 1869. On the 8th of February 1871 he was named deputy for the Seine et Oise, and participated in the drawing up of the Constitutional Laws of 1875. On the 16th of December 1875, he was named by the National Assembly senator for life. He died on the 16th of March 1888, three months after the election of his elder son, M.F.S. Carnot (*q.v.*), to the presidency of the republic. He had published *Le Ministère de l'instruction publique et des cultes du 24e février au 5e juillet 1848*, (1849), *Mémoires sur Lazare Carnot* (2 vols., 1861-1864), *Mémoires de Barère* (with David Angers, 4 vols., 1842-1843). His second son, Marie Adolphe Carnot (b. 1839), became a distinguished mining-engineer and director of the École des Mines (1899), his studies in analytical chemistry placing him in the front rank of French scientists. He was made a member of the Academy of Sciences in 1895.

See Vermorel, *Les Hommes de 1848*, (3rd ed., 1869); E. Spuller, *Histoire parlementaire de la Seconde République* (1891); P. de la Gorce, *Histoire du Second Empire* (1894 et seq.).

CARNOT, LAZARE NICOLAS MARGUERITE (1753-1823), French general, was born at Nolay in Burgundy in 1753. He received his training as an engineer at Mézières, becoming an officer of the Corps de Génie in 1773 and a captain ten years later. He had then just published his first work, an *Essai sur les machines en général*. In 1784 he wrote an essay on balloons, and his. *Éloge* of Vauban, read by him publicly, won him the commendation of Prince Henry of Prussia. But as the result of a controversy with Montalembert, Carnot abandoned the official, or Vauban, theories of the art of fortification, and went over to the "perpendicular" school of Montalembert. He was consequently imprisoned, on the pretext of having fought a duel, and only released when selected to accompany Prince Henry of Prussia in a visit to Vauban's fortifications. In 1791 he married. The Revolution drew him into political life, and he was elected a deputy for the Pas de Calais. In the Assembly he took a prominent part in debates connected with the army. Carnot was a stern and sincere republican, and voted for the execution of the king. In the campaigns of 1792 and 1793 he was continually employed as a commissioner in military matters, his greatest service being in April 1793 on the north-eastern frontier, where the disastrous battle of Neerwinden and the subsequent defection of Dumouriez had thrown everything into confusion. After doing what was possible to infuse energy into the operations of the French forces, he returned to Paris and was made a member of the Committee of Public Safety. He was charged with duties corresponding to those of the modern chief of the general staff and adjutant-general. As a member of the committee he signed its decrees and was thus at least technically responsible for the acts of the Reign of Terror. His energies were, however, directed to the organization, not yet of victory, but of defence. His labours were incessant; practically every military document in the archives of the committee was Carnot's own work, and he was repeatedly in the field with the armies. His part in Jourdan's great victory at Wattignies was so important that the credit of the day has often been assigned to Carnot. The winter of 1793-1794 was spent in new preparations, in instituting a severe discipline in the new and ill-trained troops

of the republic, and in improvising means and material of war. He continued to visit the armies at the front, and to inspire them with energy. He acquiesced in the fall of Robespierre in 1794, but later defended Barère and others among his colleagues, declaring that he himself had constantly signed papers without reading them, as it was physically impossible to do so in the press of business. When Carnot's arrest was demanded in May 1795, a deputy cried "Will you dare to lay hands on the man who has organized victory?" Carnot had just accepted promotion to the rank of major in the engineers. Throughout 1793, when he had been the soul of the national defence, and 1794, in which year he had "organized victory" in fourteen armies, he was a simple captain.

Carnot was elected one of the five Directors in November 1795, and continued to direct the war department during the campaign of 1796. Late in 1796 he was made a member (1st class) of the Institute, which he had helped to establish. He was for two periods president of the Directory, but on the *coup d'état* of the 18th Fructidor (1797) was forced to take refuge abroad. He returned to France after the 18th Brumaire (1799) and was re-elected to the Institute in 1800. Early in 1800 he became minister of war, and he accompanied Moreau in the early part of the Rhine campaign. His chief work was, however, in reducing the expenses of the armies. Contrary to the usual custom he refused to receive presents from contractors, and he effected much-needed reforms in every part of the military administration. He tendered his resignation later in the year, but it was long before the First Consul would accept it. From 1801 he lived in retirement with his family, employing himself chiefly in scientific pursuits. As a senator he consistently opposed the increasing monarchism of Napoleon, who, however, gave him in 1809 a pension and commissioned him to write a work on fortification for the school of Metz. In these years he had published *De la corrélation des figures de géométrie* (1801), *Géométrie de position* (1803), and *Principes fondamentaux de l'équilibre et du mouvement* (1803), all of which were translated into German. His great work on fortification appeared at Paris in 1810 (*De la défense de places fortes*) and was translated for the use of almost every army in Europe. He took Montalembert as his ground-work. Without sharing Montalembert's antipathy to the bastioned trace, and his predilection for high masonry caponiers, he followed out the principle of retarding the development of the attack, and provided for the most active defence. To facilitate sorties in great force he did away with a counterscarp wall, providing instead a long gentle slope from the bottom of the ditch to the crest of the glacis. This, he imagined, would compel an assailant to maintain large forces in the advanced trenches, which he proposed to attack by vertical fire from mortars. Along the front of his fortress was built a heavy detached wall, loop-holed for fire, and sufficiently high to be a most formidable obstacle. This "Carnot wall," and, in general, Carnot's principle of active defence, played a great part in the rise of modern fortification.

He did not seek employment in the field in the aggressive wars of Napoleon, remaining a sincere republican, but in 1814, when France itself was once more in danger, Carnot at once offered his services. He was made a general of division, and Napoleon sent him to the important fortress of Antwerp as governor. His defence of that place was one of the most brilliant episodes of the campaign of 1814. On his return to Paris he addressed a political memoir to the restored king of France, which aroused much attention both in France and abroad. He joined Napoleon during the Hundred Days and was made minister of the interior, the office carrying with it the dignity of count, and on the 2nd of June he was made a peer of France. On the second Restoration he was proscribed. He lived thenceforward in Magdeburg, occupying himself still with science. But his health rapidly declined, and he died at Magdeburg on the 2nd of August 1823. His remains were solemnly removed to the Panthéon in 1889. Long before this, in 1836, Antwerp had erected a statue to its defender of 1814. In 1837 Arago pronounced his *éloge* before the Académie des Sciences. The sincerity of his patriotism and his political convictions was proved in 1801-1804 and in 1814. The memory of his military career is preserved in the title, given to him in the Assembly, of "The organizer of victory." His sons, Sadi and L. Hippolyte, are separately noticed.

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CARNOT, MARIE FRANÇOIS SADI (1837-1894), fourth president of the third French Republic, son of L. Hippolyte Carnot, was born at Limoges on the 11th of August 1837. He was educated as a civil engineer, and after having highly distinguished himself at the École Polytechnique and the École des Ponts et Chaussées, obtained an appointment in the public service. His hereditary republicanism recommended him to the government of national defence, by which he was entrusted in 1870 with the task of organizing resistance in the departments of the Eure, Calvados and Seine Inférieure, and made prefect of the last named in January 1871. In the following month he was elected to the National Assembly by the department Côte d'Or. In August 1878 he was appointed secretary to the minister of public works. In September 1880 he became minister, and again in April 1885, passing almost immediately to the ministry of finance, which he held under both the Ferry and the Freycinet administrations until December 1886. When the Wilson scandals occasioned the downfall of Grévy in December 1887, Carnot's high character for integrity marked him out as a candidate for the presidency, and he obtained the support of Clémenceau and of all those who objected to the candidatures of men who have been more active in the political arena, so that he was elected by 616 votes out of 827. He assumed office at a critical period, when the republic was all but openly attacked by General Boulanger. President Carnot's ostensible part during this agitation was mainly confined to augmenting his popularity by well-timed appearances on public occasions, which gained credit for the presidency and the republic. When early in 1889, Boulanger was finally driven into exile, it fell to President Carnot's lot to appear at the head of the state on two occasions of especial interest, the celebration of the centenary of 1789 and the opening of the Paris Exhibition of that year. The perfect success of both was regarded, not unreasonably, as a popular ratification of the republic, and though continually harassed by the formation and dissolution of ephemeral ministries, by socialist outbreaks, and the beginnings of anti-Semitism, Carnot had but one serious crisis to surmount, the Panama scandals of 1892, which, if they greatly damaged the prestige of the state, increased the respect felt for its head, against whose integrity none could breathe a word. Carnot seemed to be arriving at the zenith of popularity, when on the 24th of June 1894, after delivering at a public banquet at Lyons a speech in which he appeared to imply that he nevertheless would not seek re-election, he was stabbed by an Italian anarchist named Caserio and expired almost immediately. The horror and grief excited by this tragedy were boundless, and the president was honoured with a splendid funeral in the Panthéon, Paris.

His son, FRANÇOIS CARNOT, was first elected deputy for the Cote d'Or in 1902.

See E. Zevort, *Histoire de la Troisième République*, tome iv., "La Présidence de Carnot" (Paris, 1901).

CARNOT, SADI NICOLAS LÉONHARD (1796-1832), French physicist, elder son of L.N.M. Carnot, was born at Paris on the 1st of June 1796. He was admitted to the École Polytechnique in 1812, and late in 1814 he left with a commission in the Engineers and with prospects of rapid advancement in his profession. But Waterloo and the Restoration led to a second and final proscription of his father; and though not himself cashiered, Sadi was purposely told off for the merest drudgeries of his service. Disgusted with an employment which afforded him neither leisure for original work nor opportunities for acquiring scientific instruction, he presented himself in 1819 at the examination for admission to the staff corps (*état-major*) and obtained a lieutenancy. He then devoted himself with astonishing ardour to mathematics, chemistry, natural history, technology and even political economy. He was an enthusiast in music and other fine arts; and he habitually practised as an amusement, while deeply studying in theory, all sorts of athletic sports, including swimming and fencing. He became captain in the Engineers in 1827, but left the service altogether in the following year. His naturally feeble constitution, further weakened by excessive study, broke down finally in 1832. An attack of scarlatina led to brain fever, and he had scarcely recovered when he fell a victim to cholera, of which he died in Paris on the 24th of August 1832. He was one of the most original and profound thinkers who have ever devoted themselves to science. The only work he published was his *Réflexions sur la puissance motrice du feu et sur les machines propres à développer cette puissance* (Paris, 1824). This contains but a fragment of his scientific discoveries, but it is sufficient to put him in the very foremost rank, though its full value was not recognized until pointed out by Lord Kelvin in 1848 and 1849. Fortunately his manuscripts had been preserved, and extracts were appended to a reprint of his *Puissance*

motrice by his brother, L.H. Carnot, in 1878. These show that he had not only realized for himself the true nature of heat, but had noted down for trial many of the best modern methods of finding its mechanical equivalent, such as those of J.P. Joule with the perforated piston and with the friction of water and mercury. Lord Kelvin's experiment with a current of gas forced through a porous plug is also given. "Carnot's principle" is fundamental in the theory of thermodynamics (*q.v.*).

CARNOUSTIE, a police burgh and watering-place of Forfarshire, Scotland. Pop. (1901) 5204. It lies on the North Sea, 10¾ m. E.N.E. of Dundee by the North British railway. Bathing and golfing are good. Barry Links, a triangular sandy track occupying the south-eastern corner of the shire, are used as a camping and manoeuvring ground for the artillery and infantry forces of the district, and occasionally of Scotland. Its most extreme point is called Buddon Ness, off which are the dangerous shoals locally known as the Roaring Lion, in consequence of the deep boom of the waves. On the Ness two lighthouses have been built at different levels, the lights of which are visible at 13 and 16 m.

CARNUNTUM (Καρνοῦς in Ptolemy), an important Roman fortress, originally belonging to Noricum, but after the 1st century A.D. to Pannonia. It was a Celtic town, the name, which is nearly always found with K on monuments, being derived from *Kar, Karn* ("rock," "cairn"). Its extensive ruins may still be seen near Hainburg, between Deutsch-Altenburg and Petronell, in lower Austria. Its name first occurs in history during the reign of Augustus (A.D. 6), when Tiberius made it his base of operations in the campaigns against Maroboduus (Marbod). A few years later it became the centre of the Roman fortifications along the Danube from Vindobona (Vienna) to Brigetio (O-Szöny), and (under Trajan or Hadrian) the permanent quarters of the XIV legion. It was also a very old mart for the amber brought to Italy from the north. It was created a municipium by Hadrian (Aelium Carnuntum). Marcus Aurelius resided there for three years (172-175) during the war against the Marcomanni, and wrote part of his *Meditations*. Septimius Severus, at the time governor of Pannonia, was proclaimed emperor there by the soldiers (193). In the 4th century it was destroyed by the Germans, and, although partly restored by Valentinian I., it never regained its former importance, and Vindobona became the chief military centre. It was finally destroyed by the Hungarians in the middle ages.

A special society (*Carnuntumverein*) exists for the exploration of the numerous ruins, the results of which will be found in J.W. Kubitschek and S. Frankfurter, *Führer durch Carnuntum* (3rd ed., 1894); see also E. von Sacken, "Die römische Stadt Carnuntum," in *Sitzungsberichte der k. Akad. der Wissenschaften*, ix. (Vienna, 1852); article by Kubitschek in Pauly-Wissowa's *Realencydopadie*, iii. part ii. (1899); *Corpus Inscriptionum Latinarum*, iii., part i. p. 550.

CARNUTES (Carnuti, Carnutae, Καρνουτῖνοι in Plutarch), a Celtic people of central Gaul, between the Sequana (Seine) and the Liger (Loire). Their territory corresponded to the dioceses of Chartres, Orléans and Blois, that is, the greater part of the modern departments of Eure-et-Loir, Loiret, Loir-et-Cher. It was regarded as the political and religious centre of the Gallic nation. The chief towns were Cenabum (not Genabum; Orléans) and Autricum (Chartres). According to Livy (v. 34) the Carnutes were one of the tribes which accompanied Bellovesus in his invasion of Italy during the reign of Tarquinius Priscus. In the time of Caesar they were dependents of the Remi, who on one occasion interceded for them. In 52 they joined in the rebellion of Vercingetorix. As a punishment for the treacherous murder of some Roman merchants and one of Caesar's commissariat officers at Cenabum, the town was

burnt and the inhabitants put to the sword or sold as slaves. During the war they sent 12,000 men to relieve Alesia, but shared in the defeat of the Gallic army. Having attacked the Bituriges Cubi, who appealed to Caesar for assistance, they were forced to submit. Under Augustus, the Carnutes, as one of the peoples of Lugdunensis, were raised to the rank of *civitas socia* or *foederata*, retaining their own institutions, and only bound to render military service to the emperor. Up to the 3rd century Autricum (later Carnutes, whence Chartres) was the capital, but in 275 Aurelian changed Cenabum from a *vicus* into a *civitas* and named it Aurelianum or Aurelianensis urbs (whence Orléans).

See Caesar, *Bell. Gall.* v. 25, 29, vii. 8, 11, 75, viii. 5, 31; Strabo iv. pp. 191-193; R. Boutrays, *Urbis gentisque Carnutum historia* (1624); A. Desjardins, *Géographie historique de la Gaule*, ii. (1876-1893); article and bibliography in *La Grande Encyclopédie*, T.R. Holmes, *Caesar's Conquest of Gaul* (1899), p. 402, on Cenabum.

CARO, ANNIBALE (1507-1566), Italian poet, was born at Civita Nuova, in Ancona, in 1507. He became tutor in the family of Lodovico Gaddi, a rich Florentine, and then secretary to his brother Giovanni, by whom he was presented to a valuable ecclesiastical preferment at Rome. At Gaddi's death, he entered the service of the Farnese family, and became confidential secretary in succession to Pietro Lodovico, duke of Parma, and to his sons, duke Ottavio and cardinals Ranuccio and Alexander. Caro's most important work was his translation of the *Aeneid* (Venice, 1581; Paris, 1760). He is also the author of *Rime, Canzoni*, and sonnets, a comedy named *Gli Straccioni*, and two clever *jeux d'esprit*, one in praise of figs, *La Ficheide*, and another in eulogy of the big nose of Leoni Ancona, president of the Academia della Vertu. Caro's poetry is distinguished by very considerable ability, and particularly by the freedom and grace of its versification; indeed he may be said to have brought the *verso sciolto* to the highest development it has reached in Italy. His prose works consist of translations from Aristotle, Cyprian and Gregory Nazianzen; and of letters, written in his own name and in those of the cardinals Farnese, which are remarkable both for the baseness they display and for their euphemistic polish and elegance. His fame has been greatly damaged by the virulence with which he attacked Lodovico Castelvetro in one of his canzoni, and by his meanness in denouncing him to the Holy Office as translator of some of the writings of Melanchthon. He died at Rome about 1566.

CARO, ELME MARIE (1826-1887), French philosopher, was born on the 4th of March 1826 at Poitiers. His father, a professor of philosophy, gave him an excellent education at the Stanislas College and the École Normale, where he graduated in 1848. After being professor of philosophy at several provincial universities, he received the degree of doctor, and came to Paris in 1858 as master of conferences at the École Normale. In 1861 he became inspector of the Academy of Paris, in 1864 professor of philosophy to the Faculty of Letters, and in 1874 a member of the French Academy. He married Pauline Cassin, the authoress of the *Péché de Madeleine* and other well-known novels. He died in Paris on the 13th of July 1887. In his philosophy he was mainly concerned to defend Christianity against modern Positivism. The philosophy of Cousin influenced him strongly, but his strength lay in exposition and criticism rather than in original thought. Besides important contributions to *La France* and the *Revue des deux mondes*, he wrote *Le Mysticisme au XVIII^e^ siècle* (1852-1854), *L'Idee de Dieu* (1864), *Le Matérialisme et la science* (1868), *Le Pessimisme au XIX^e^ siècle* (1878), *Jours d'épreuves* (1872), *M. Littré et le positivisme* (1883), *George Sand* (1887), *Mélanges et portraits* (1888), *La Philosophie de Goethe* (2nd ed., 1880).

CAROL (O. Fr. *carole*), a hymn of praise, especially such as is sung at Christmas in the

open air. The origin of the word is obscure. Diez suggests that the word is derived from *chorus*. Others ally it with *corolla*, a garland, circle or coronet,[1] the earliest sense of the word being apparently "a ring" or "circle," "a ring dance." Stonehenge, often called the Giants' Dance, was also frequently known as the Carol; thus Harding, *Chron.* lxx. x., "Within (the) Giauntes Carole, that so they hight, The (Stone hengles) that nowe so named been." The Celtic forms, often cited as giving the origin of the word, are derivatives of the English or French. The crib set up in the churches at Christmas was the centre of a dance, and some of the most famous of Latin Christmas hymns were written to dance tunes. These songs were called *Wiegenlieder* in German, *noéls* in French, and carols in English. They were originally modelled on the songs written to accompany the choric dance, which were probably the starting-point of the lyric poetry of the Germanic peoples. Strictly speaking, therefore, the word should be applied to lyrics written to dance measures; in common acceptation it is applied to the songs written for the Christmas festival. Carolling, *i.e.* the combined exercise of dance and song, found its way from pagan ritual into the Christian church, and the clergy, however averse they might be from heathen survivals, had to content themselves in this, as in many other cases, with limiting the practice. The third council of Toledo (589) forbade dancing in the churches on the vigils of saints' days, and secular dances in church were forbidden by the council of Auxerre in the next year. Even as late as 1209 it was necessary for the council of Avignon to forbid theatrical dances and secular songs in churches. Religious dances persisted longest on Shrove Tuesday, and a castanet dance by the choristers round the lectern is permitted three times a year in the cathedral of Seville. The Christmas festival, which synchronized with and superseded the Latin and Teutonic feasts of the winter solstice, lent itself especially to gaiety. The "crib" of the Saviour was set up in the churches or in private houses, in the traditional setting of the stable, with earthen figures of the Holy Family, the ox and the ass; and carols were sung and danced around it. The "rocking of the cradle" was the occasion of dialogue between Joseph and Mary which was not without elements of comedy, and gave rise to lullabies such as the well-known German *Dormi fili*. The adoration of the shepherds and the visit of the Magi also provided matter for dramatic and choral representation. The singing of the carol has survived in places where the institution of the "crib," said to have been originated by St Francis of Assisi to inculcate the doctrine of the incarnation, has been long in disuse, but in the West Riding of Yorkshire the children who go round carol-singing still carry "milly-boxes" (My Lady boxes) containing figures which represent the Virgin and Child.

That carol-singing early became a pretext for the asking of alms is obvious from an Anglo-Norman carol preserved in the British Museum (MS. Reg. 16 E. viii.), *Seigneurs ore entendey à nus*, which is little more than a drinking song. Carols were an important element in the mystery plays of the Nativity, and one of these, included in the *Marguerites de la Marguerite des princesses, très-illustre reine de Navarre* (Lyons, 1547), incidentally gives evidence of the connexion of dancing and carol-singing, for the shepherds and shepherdesses open their chorus at the manger with "*Dansons, chantons, faisons rage*." There is a long English carol relating the chief incidents of the life of Christ, which is a curious example of the mixture of the sacred and profane common in this species of composition. It begins "To-morrow shall be my dancing day," and has for refrain—

"Sing, oh! my love, oh! my love, my love, my love;
This have I done for my true love."

There are extant numerous carols dating from the 15th century which have the characteristic features of folksong. The famous Cherry-tree Carol, "Joseph was an old man," is based on an old legend which is related in the Coventry mystery plays. "I saw three ships come sailing in," and "The Camel and the Crane," though of more modern date, preserve curious legends. Numerous entries in the household accounts of the Tudor sovereigns show that carol-singing was popular throughout the 16th century, and the literature of Christmas was enriched in the next century by poems which are often included in collections of carols, though they were probably written to be read rather than sung. Milton, Crashaw, Southwell, Ben Jonson, George Herbert and George Wither all produced Christmas poems, but the richest collection by any one poet is to be found in the poems of Herrick, whose "Come, bring with a noise" is a typical carol of the jovial kind, and may well have been written to a dance tune. Among 18th-century religious carols perhaps the most famous is Charles Wesley's "Hark, how all the welkin rings," better known in the variant, "Hark, the herald angels sing." The artificial modern revival of carol-singing has produced a quantity of new carols, the best of which are perhaps mostly derived from medieval Latin Christmas hymns. Among the many modern Christmas poems one of the most striking is Swinburne's "Three Damsels in the Queen's Chamber," which is, however, a ballad rather than a carol.

The earliest printed collection of carols was issued by Wynkyn de Worde in 1521. It contained the famous Boar's Head carol, *Caput apri defero, Reddens laudes Domino*, which in a slightly altered form is sung at Queen's College, Oxford, on the bringing in of the boar's head. Modern collections of ancient carols are derived chiefly from three tracts belonging to the collection of Anthony à Wood, preserved in the Bodleian library, from a 15th-century MS. (Sloane 2593), a 16th-century MS. with the music (Add. 5665), and other MSS. in the British Museum, and from oral tradition. In the 15th century T. Bloomer of Birmingham published a number of carols in the form of broad-sides. Among the numerous collections of French carols is *Noei Borguignon de Gui Barôzai* (1720), giving the words and the music of thirty-four *noëls*, many of them very free in character. The term *noël* passed into the English carol as a favourite refrain, "nowell," and seems to have been in common use in France as an equivalent for *vivat*.

Among the more important modern collections of Christmas carols are: *Songs and Carols* (1847), edited by T. Wright for the Percy Society from Sloane MS. 2593; W. Sandys, *Christmastide, its History, Festivities and Carols* (1852); *Christmas with the Poets* (edited by V.H., 4th ed., 1872); T. Helmore and J.M. Neale, *Carols for Christmastide* (1853-1854), with music; R.R. Chope, *Carols* (new and complete edition, 1894), a tune-book for church use, with an introduction by S. Baring-Gould; H.R. Bramley, *Christmas Carols, New and Old*, the music by Dr Stainer; A.H. Bullen, *Carols and Poems* (1885); J.A. Fuller Maitland and W.S. Rockstro, *Thirteen Carols of the Fifteenth Century*, from a Trinity Coll., Cambridge, MS. (1891). See also Julian's *Dictionary of Hymnology, s.v.* "Carol"; E. Cortet, *Essai sur les fêtes religieuses* (1867).

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1 In architecture, the term "carol" (also wrongly spelled "carrel" or "carrol") is used, in the sense of an enclosure, of a small chapel or oratory enclosed by screens, and also sometimes of the rails of the screens themselves. It is more particularly applied to the separate seats near the windows of a cloister (*q.v.*), used by the monks for the purposes of study, &c. The term "carol" has, by a mistake, been sometimes used of a scroll bearing an inscription of a text, &c.

CAROLINE (1683-1737), wife of George II., king of Great Britain and Ireland, was a daughter of John Frederick, margrave of Brandenburg-Ansbach (d. 1686). Born at Ansbach on the 1st of March 1683, the princess passed her youth mainly at Dresden and Berlin, where she enjoyed the close friendship of Sophie Charlotte, wife of Frederick I. of Prussia; she married George Augustus, electoral prince of Hanover, in September 1705. The early years of her married life were spent in Hanover. She took a continual interest in the approaching accession of the Hanoverian dynasty to the British throne, was on very friendly terms with the old electress Sophia, and corresponded with Leibnitz, whose acquaintance she had made in Berlin. In October 1714 Caroline followed her husband and her father-in-law, now King George I., to London. As princess of Wales she was accessible and popular, and took the first place at court, filling a difficult position with tact and success. When the quarrel between the prince of Wales and his father was attaining serious proportions, Caroline naturally took the part of her husband, and matters reached a climax in 1717. Driven from court, ostracized by the king, deprived even of the custody of their children, the prince and princess took up their residence in London at Leicester House, and in the country at Richmond. They managed, however, to surround themselves with a distinguished circle; Caroline had a certain taste for literature, and among their attendants and visitors were Lord Chesterfield, Pope, Gay, Lord Hervey and his wife, the beautiful Mary Lepel. A formal reconciliation with George I. took place in 1720. In October 1727 George II. and his queen were crowned. During the rest of her life Queen Caroline's influence in English politics was very chiefly exercised in support of Sir Robert Walpole; she kept this minister in power, and in control of church patronage. She was exceedingly tolerant, and the bishops appointed by her were remarkable rather for learning than for orthodoxy. During the king's absences from England she was regent of the kingdom on four occasions. On the whole, Caroline's relations with her husband, to whom she bore eight children, were satisfactory. A clever and patient woman, she was very complaisant towards the king, flattering his vanity and acknowledging his mistresses, and she retained her influence over him to the end. She died on the 20th of November 1737.

Caroline appears in Scott's *Heart of Midlothian*; see also Lord Hervey, *Memoirs of the Reign of George II.*, ed. by J.W. Croker (1884); W.H. Wilkins, *Caroline the Illustrious* (1904); and A.D. Greenwood, *Lives of the Hanoverian Queens of England*, vol. i. (1909).

CAROLINE AMELIA AUGUSTA (1768-1821), queen of George IV. of Great Britain, second daughter of Charles William Ferdinand, duke of Brunswick-Wolfenbüttel, was born on the 17th of May 1768. She was brought up with great strictness, and her education did not fit her well for her subsequent station in life. In 1795 she was married to the then prince of Wales (see GEORGE IV.), who disliked her and separated from her after the birth of a daughter in January 1796. The princess resided at Blackheath; and as she was thought to have been badly treated by her profligate husband, the sympathies of the people were strongly in her favour. About 1806 reports reflecting on her conduct were circulated so openly that it was deemed necessary for a commission to inquire into the circumstances. The princess was acquitted of any serious fault, but various improprieties in her conduct were pointed out and censured. In 1814 she left England and travelled on the continent, residing principally in Italy. On the accession of George in 1820, orders were given that the English ambassadors should prevent the recognition of the princess as queen at any foreign court. Her name also was formally omitted from the liturgy. These acts stirred up a strong feeling in favour of the princess among the English people generally, and she at once made arrangements for returning to England and claiming her rights. She rejected a proposal that she should receive an annuity of £50,000 a year on condition of renouncing her title and remaining abroad. Further efforts at compromise proved unavailing; Caroline arrived in England on the 6th of June, and one month later a bill to dissolve her marriage with the king on the ground of adultery was brought into the House of Lords. The trial began on the 17th of August 1820, and on the 10th of November the bill, after passing the third reading, was abandoned. The public excitement had been intense, the boldness of the queen's counsel, Brougham and Denman, unparalleled, and the ministers felt that the smallness of their majority was virtual defeat. The queen was allowed to assume her title, but she was refused admittance to Westminster Hall on the coronation day, July 19, 1821. Mortification at this event seems to have hastened her death, which took place on the 7th of August of the same year.

See *A Queen of Indiscretions, the Tragedy of Caroline of Brunswick, Queen of England*, translated by F. Chapman from the Italian of Graziano Paolo Clerici (London, 1907), with numerous portraits, &c. Of contemporary authorities the *Creevy Papers* (1905) throw the most interesting sidelights on the subject.

CAROLINE ISLANDS, a widely-scattered archipelago in the Pacific Ocean, E. of the Philippines and N. of New Guinea, included in Micronesia, between 5° and 10° N., and 135° and 165° E., belonging to Germany. They fall into three main groups, the Western, Central and Eastern Carolines, the central being the most numerous, while the western include the Pelew group. The total land area is about 380 sq. m., and out of this, 307 sq. m. is covered by the four main islands, Ponape and Kusaie in the eastern group, Truk or Hogolu in the central, and Yap in the western. These islands are of considerable elevation (the highest point of Ponape approaches 3000 ft.), but the rest are generally low coral islets. The climate is equable and moist, but healthy; but the islands are subject to heavy storms. The total population is estimated at 36,000. The natives, who are Micronesian hybrids of finer physique than their kinsmen of the Pelew Islands, have a comparatively high mental standard, being careful agriculturists, and peculiarly clever boatbuilders and navigators. The Germans divide the whole archipelago into two administrative districts, eastern and western, having the seats of government at Ponape and Yap respectively. The principal article of export is copra. The islands were discovered (at least in part) by the Portuguese Diego da Rocha in 1527, and called by him the Sequeira Islands. In 1686 Admiral Francesco Lazeano, who made further explorations, renamed them the Carolines in honour of Charles II. of Spain. The islands were subsequently visited by a few travellers; but the natives have only in modern times been reconciled to the presence of foreigners; an early visit of missionaries (1731) resulted in one of several murderous attacks on white men which darken the history of the islands; and it was only in 1875 that Spain, claiming the group, made some attempt to assert her rights. These were contested by Germany, whose flag was hoisted on Yap, and the matter was referred to the arbitration of Pope Leo XIII. in 1885. He decided in favour of Spain, but gave Germany free trading rights; and in 1899 Germany took over the

administration of the islands from Spain, paying 25,000,000 pesetas (nearly £1,000,000 sterling).

Ancient Stone Buildings.—In Ponape and Kusaie, massive stone structures, similar to those which occur in several other parts of the Pacific Ocean, have long been known to exist. They have been closely explored by Herr Kubary, Mr F.J. Moss, and later Mr F.W. Christian. None of the colossal structures hitherto described appears to have been erected by the present Melanesian or Polynesian peoples, while their wide diffusion, extending as far as Easter Island, within 400 m. of the New World, points to the occupation of the Pacific lands by a prehistoric race which had made some advance in general culture. The Funafuti borings (1897) show almost beyond doubt that Polynesia is an area of comparatively recent subsidence. Hence the land connexions must have formerly been much easier and far more continuous than at present. The dolmen-builders of the New Stone Age are now known to have long occupied both Korea and Japan, from which advanced Asiatic lands they may have found little difficulty in spreading over the Polynesian world, just as in the extreme west they were able to range over Scandinavia, Great Britain and Ireland. To Neolithic man, still perhaps represented by some of the more light-coloured and more regular-featured Polynesian groups, may therefore not unreasonably be attributed these astonishing remains, which assume so many different forms according to the nature of the locality, but seem generally so out of proportion with the present restricted areas on which they stand. With the gradual subsidence of these areas their culture would necessarily degenerate, although echoes of sublime theogonies and philosophies are still heard in the oral traditions and folklore of many Polynesian groups. In the islet of Lele, close to Kusaie, at the eastern extremity of Micronesia, the ruins present the appearance of a citadel with cyclopean ramparts built of large basaltic blocks. There are also numerous canals, and what look like artificial harbours constructed amid the shallow lagoons.

In Ponape the remains are of a somewhat similar character, but on a much larger scale, and with this difference, that while those of Lele all stand on the land, those of Ponape are built in the water. The whole island is strewn with natural basaltic prisms, some of great size: and of this material, brought by boats or rafts from a distance of 30 m. and put together without any mortar, but sustained by their own weight, are built all the massive walls and other structures on the east side of the island. The walls of the main building near the entrance of Metalanim harbour form a massive quadrangle 200 ft. on all sides, with inner courts, vault and raised platform with walls 20 to 40 ft. high and from 8 to 18 ft. thick. Some of the blocks are 25 ft. long and 8 ft. in circumference, and many of them weigh from 3 to 4 tons. There are also numerous canals from 30 to 100 ft. wide, while a large number of islets, mainly artificial, covering an area of 9 sq. m., have all been built up out of the shallow waters of the lagoon round about the entrance of the harbour, with high sea-walls composed of the same huge basaltic prisms. In, some places the walls of this “Pacific Venice” are now submerged to some depth, as if the land had subsided since the construction of these extensive works. Elsewhere huge breakwaters had been constructed, the fragments of which may still be seen stretching away for a distance of from 2 to 3 m. Most observers, such as Admiral Sir Cyprian Bridge and Mr. Le Hunte, agree that these structures could not possibly be the work of any of the present Polynesian peoples, and attribute them to a now extinct prehistoric race, the men of the New Stone Age from the Asiatic mainland.

Stone Money.—The inhabitants of Yap are noted for possessing the most extraordinary currency, if it can be so called, in the whole world. Besides the ordinary shell money, there is a sort of stone coinage, consisting of huge calcite or limestone discs or wheels from 6 in. to 12 ft. in diameter, and weighing up to nearly 5 tons. These are all quarried in the Pelew Islands, 200 m. to the south, and are now brought to Yap in European vessels. But some were in the island long before the arrival of the whites, and must consequently have been brought by native vessels or on rafts. The stones, which are rather tokens than money, do not circulate, but are piled up round about the chief’s treasure-house, and appear to be regarded as public property, although it is hard to say what particular use they can serve. They appear to be kept rather for show and ornament than for use.

See F.W. Christian, *The Caroline Islands* (London, 1899); G. Volkens, “Über die Karolinen Insel Yap,” in *Verhandlungen Gesellschaft Erdkunde Berlin.*, xxviii. (1901); J.S. Kubary, *Ethnographische Beitrage zur Kentniss des Karolinen-Archipel* (Leiden, 1889-1892); De Abrade, *Historia del conflicto de las Carolinas, &c.* (Madrid, 1886).

CAROLINGIANS, the name of a family (so called from Charlemagne, its most illustrious member) which gained the throne of France A.D. 751. It appeared in history in 613, its origin being traced to Arnulf (Arnoul), bishop of Metz, and Pippin, long called Pippin of Landen, but more correctly Pippin the Old or Pippin I. Albeit of illustrious descent, the genealogies which represent Arnulf as an Aquitanian noble, and his family as connected—by more or less complicated devices—with the saints honoured in Aquitaine, are worthless, dating from the time of Louis the Pious in the 9th century. Arnulf was one of the Austrasian nobles who appealed to Clotaire II., king of Neustria, against Brunhilda, and it was in reward for his services that he received from Clotaire the bishopric of Metz (613). Pippin, also an Austrasian noble, had taken a prominent part in the revolution of 613. These two men Clotaire took as his counsellors; and when he decided in 623 to confer the kingdom of Austrasia upon his son Dagobert, they were appointed mentors to the Austrasian king, Pippin with the title of mayor of the palace. Before receiving his bishopric, Arnulf had had a son Adalgiselus, afterwards called Anchis; Pippin's daughter, called Begga in later documents, was married to Arnulf's son, and of this union was born Pippin II. Towards the end of the 7th century Pippin II., called incorrectly Pippin of Heristal, secured a preponderant authority in Austrasia, marched at the head of the Austrasians against Neustria, and gained a decisive victory at Tertry, near St Quentin (687). From that date he may be said to have been sole master of the Frankish kingdom, which he governed till his death (714). In Neustria Pippin gave the mayoralty of the palace to his son Grimoald, and afterwards to Grimoald's son Theodebald; the mayoralty in Austrasia he gave to his son Drogo, and subsequently to Drogo's children, Arnulf and Hugh. Charles Martel, however, a son of Pippin by a concubine Chalpaïda, seized the mayoralty in both kingdoms, and he it was who continued the Carolingian dynasty. Charles Martel governed from 714 to 741, and in 751 his son Pippin III. took the title of king. The Carolingian dynasty reigned in France from 751 to 987, when it was ousted by the Capetian dynasty. In Germany descendants of Pippin reigned till the death of Louis the Child in 911; in Italy the Carolingians maintained their position until the deposition of Charles the Fat in 887. Charles, duke of Lower Lorraine, who was thrown into prison by Hugh Capet in 991, left two sons, the last male descendants of the Carolingians, Otto, who was also duke of Lower Lorraine and died without issue, and Louis, who after the year 1000 vanishes from history.

See P.A.F. Gérard and L.A. Warnkönig, *Histoire des Carolingiens* (Brussels, 1862); H.E. Bonnell, *Anfange des Karoling. Hauses* (Berlin, 1866); J.F. Böhmer and E. Mühlbacher, *Regesten d. Kaiserreichs unter d. Karolingern* (Innsbruck, 1889 seq.); E. Mühlbacher, *Deutsche Gesch. unter d. Karolingern* (Stuttgart, 1896); F. Lot, *Les Derniers Carolingiens* (Paris, 1891).

(C. Pf.)

CAROLUS-DURAN, the name adopted by the French painter Charles Auguste Emile Durand (1837-), who was born at Lille on the 4th of July 1837. He studied at the Lille Academy and then went to Paris, and in 1861 to Italy and Spain for further study, especially devoting himself to the pictures of Velasquez. His subject picture "Murdered," or "The Assassination" (1866), was one of his first successes, and is now in the Lille museum, but he became best known afterwards as a portrait-painter, and as the head of one of the principal ateliers in Paris, where some of the most brilliant artists of a later generation were his pupils. His "Lady with the Glove" (1869), a portrait of his own wife, was bought for the Luxembourg. In 1889 he was made a commander of the Legion of Honour. He became a member of the Académie des Beaux-arts in 1904, and in the next year was appointed director of the French academy at Rome in succession to Eugène Guillaume.

CARORA, an inland town of the state of Lara, Venezuela, on the Carora, a branch of the Tocuyo river, about 54 m. W. by S. of the city of Barquisimeto, and 1128 ft. above sea-level. Pop. (1908 estimate) 6000. The town is comparatively well-built and possesses a fine parish church, and a Franciscan convent and hermitage. It was founded in 1754, and its colonial history shows considerable prosperity, its population at that time numbering 9000 to 10,000.

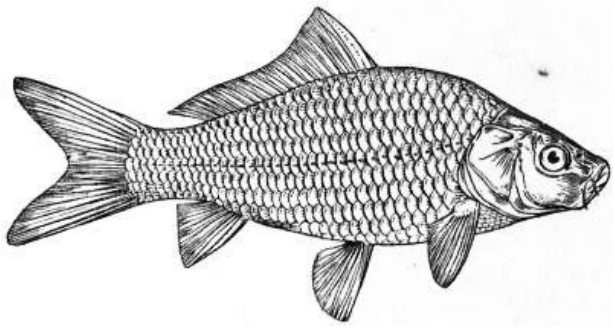
The neighbouring country is devoted principally to raising horses, mules and cattle; and in addition to hides and leather, it exports rubber and other forest products.

CARP, the typical fish of a large family (*Cyprimdae*) of Ostariophysi, as they have been called by M. Sagemehl, in which the air-bladder is connected with the ear by a chain of small bones (so-called Weberian ossicles). The mouth is usually more or less protractile and always toothless; the lower pharyngeal bones, which are large and falciform, subparallel to the branchial arches, are provided with teeth, often large and highly specialized, in one, two or three series (pharyngeal teeth), usually working against a horny plate attached to a vertical process of the basioccipital bone produced under the anterior vertebrae, mastication being performed in the gullet. These teeth, adapted to various requirements, vary according to the genus, being conical, hooked, spoon-shaped, molariform, &c.

The species are extremely numerous, about 1400 being known, nearly entirely confined to fresh water, and feeding on vegetable substances or small animals. They are dispersed over the whole world with the exception of South America, Madagascar, Papuasia, and Australasia. Remains of several of the existing genera have been found in Oligocene and later beds of Europe, Sumatra and North America. One member of the *Cyprinidae* is at present known to be viviparous, but no observations have as yet been made on its habits. It is a small barbel discovered in Natal by Max Weber, and described by him under the name *Barbus viviparus*.

The *Cyprinidae*[1] are divided into four subfamilies:—*Catostominae* (mostly from North America, with a few species from China and eastern Siberia), in which the maxillary bones take a share in the border of the mouth, and the pharyngeal teeth are very numerous and form a single, comb-like series; *Cyprininae*, the great bulk of the family, more or less conforming to the type of the carp; *Cobitinae*, or loaches (Europe, Asia, Abyssinia), which are dealt with in a separate article (see Loach); and the *Homalopterinae* (China and south-eastern Asia), mountain forms allied to the loaches, with a quite rudimentary air-bladder.

For descriptions of other Cyprinids than the carp, see Goldfish, Barbel, Gudgeon, Rudd, Roach, Chub, Dace, Minnow, Tench, Bream, Bleak, Bitterling, Mahseer.



The Common Carp.

The carp itself, *Cyprinus carpio*, has a very wide distribution, having spread, through the agency of man, over nearly the whole of Europe and a part of North America, where it lives in lakes, ponds, canals, and slow-running rivers with plenty of vegetation. The carp appears to be a native of temperate Asia and perhaps also of south-eastern Europe, and to have been introduced into other parts in the 12th and 13th century; it was first mentioned in England in 1496. The acclimatization of the carp in America has been a great success, especially in the northern waters, where, the growth continuing throughout the entire year, the fish soon attains a remarkable size. The presence of carp in Indo-China and the Malay Archipelago is probably also to be ascribed to human agency. In the British Isles the carp seldom reaches a length of 2½ ft., and a weight of 20 ℔, whilst examples of that size are quite frequent on the continent, and others measuring 4½ ft. and weighing 60 ℔ or more are on record. The fish is characterized by its large scales (34 to 40 in the lateral line), its long dorsal fin, the first ray of which is stiff and serrated, and the presence of two small barbels on each side of the mouth. But it varies much in form and scaling, and some most aberrant varieties have been fixed by artificial selection, the principal being the king-carp or mirror-carp, in which the scales are enlarged and reduced in number, forming more or less regular longitudinal series

on the sides, and the leather-carp, in which the scales have all but disappeared, the fish being covered with a thick, leathery skin. Deformed examples are not of rare occurrence.

Although partly feeding on worms and other small forms of animal life, the carp is principally a vegetarian, and the great development of its pharyngeal apparatus renders it particularly adapted to a graminivorous régime. The longevity of the fish has probably been much exaggerated, and the statements of carp of 200 years living in the ponds of Pont-Chartrain and other places in France and elsewhere do not rest on satisfactory evidence.

A close ally of the carp is the Crucian carp, *Cyprinus carassius*, chiefly distinguished by the absence of barbels. It inhabits Europe and northern and temperate Asia, and is doubtfully indigenous to Great Britain. It is a small fish, rarely exceeding a length of 8 or 9 in. It has many varieties. One of these, remarkable for its very short, thick head and deep body, is the so-called Prussian carp, *C. gibelio*, often imported into English ponds, whilst the best known is the goldfish (*q.v.*), *C. auralus*, first produced in China.

(G. A. B.)

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1 The name of the fishes of the genus *Cyprinus* is derived from the island of Cyprus, the ancient sanctuary of Venus; this name is supposed to have arisen from observations of the fecundity and vivacity of carp during the spawning period.

CARPACCIO, VITTORIO, or Vittore (c. 1465-c. 1522), Italian painter, was born in Venice, cf an old Venetian family. The facts of his life are obscure, but his principal works were executed between 1490 and 1519; and he ranks as one of the finest precursors of the great Venetian masters. The date of his birth is conjectural. He is first mentioned in 1472 in a will of his uncle Fra Ilario, and Dr Ludwig infers from this that he was born c. 1455, on the ground that no one could enter into an inheritance under the age of fifteen; but the inference ignores the possibility of a testator making his will in prospect of the beneficiary attaining his legal age. Consideration of the youthful style of his earliest dated pictures (“St Ursula” series, Venice, 1490) makes it improbable that at that time he had reached so mature an age as thirty-five; and the date of his birth is more probably to be guessed from his being about twenty-five in 1490. What is certain is that he was a pupil (not, as sometimes thought, the master) of Lazzaro Bastiani, who, like the Bellini and Vivarini, was the head of a large *atelier* in Venice, and whose own work is seen in such pictures as the “S. Veneranda” at Vienna, and the “Doge Mocenigo kneeling before the Virgin” and “Madonna and Child” (formerly attributed to Carpaccio) in the National Gallery, London. In later years Carpaccio appears to have been influenced by Cima da Conegliano (*e.g.* in the “Death of the Virgin,” 1508, at Ferrara). Apart from the “St Ursula” series, his scattered series of the “Life of the Virgin” and “Life of St Stephen,” and a “Dead Christ” at Berlin, may be specially mentioned.

For an authoritative and detailed account, see the *Life and Works of Vittorio Carpaccio*, by Pompeo Molmenti and Gustav Ludwig, Eng. trans, by R.H. Cust (1907); and the criticism by Roger Fry, “A Genre Painter and his Critics,” in the *Quarterly Review* (London, April 1908).

CARPATHIAN MOUNTAINS[1] (Lat. *Monies Sarmatici*; Med. Lat. *Montes Nivium*), the eastern wing of the great central mountain system of Europe. With the exception of the extreme southern and south-eastern ramifications, which belong to Rumania, the Carpathians lie entirely within Austrian and Hungarian territory. They begin on the Danube near Pressburg, surround Hungary and Transylvania in a large semicircle, the concavity of which is towards the south-west, and end on the Danube near Orsova. The total length of the Carpathians is over 800 m., and their width varies between 7 and 230 m., the greatest width of the Carpathians corresponding with its highest altitude. Thus the system attains its greatest breadth in the Transylvanian plateau, and in the meridian of the Tatra group. It covers an area of 72,600 sq. m., and after the Alps is the most extensive mountain system of Europe. The Carpathians do not form an uninterrupted chain of mountains, but consist of several orographically and geologically distinctive groups; in fact they present as great a

structural variety as the Alps; but as regards magnificence of scenery they cannot compare with the Alps. The Carpathians, which only in a few places attain an altitude of over 8000 ft., lack the bold peaks, the extensive snow-fields, the large glaciers, the high waterfalls and the numerous large lakes which are found in the Alps. They are nowhere covered by perpetual snow, and glaciers do not exist, so that the Carpathians, even in their highest altitude, recall the middle region of the Alps, with which, however, they have many points in common as regards appearance, structure and flora. The Danube separates the Carpathians from the Alps, which they meet only in two points, namely, the Leitha Mountains at Pressburg, and the Bakony Mountains at Vacz (Waitzen), while the same river separates them from the Balkan Mountains at Orsova. The valley of the March and Oder separates the Carpathians from the Silesian and Moravian chains, which belong to the middle wing of the great central mountain system of Europe. The Carpathians separate Hungary and Transylvania from Lower Austria, Moravia, Silesia, Galicia, Bukovina and Rumania, while its ramifications fill the whole northern part of Hungary, and form the quadrangular mass of the Transylvanian plateau. Unlike the other wings of the great central system of Europe, the Carpathians, which form the watershed between the northern seas and the Black Sea, are surrounded on all sides by plains, namely the great Hungarian plain on the south-west, the plain of the Lower Danube (Rumania) on the south, and the Galician plain on the north-east.

The Carpathian system can be divided into two groups: the Carpathians proper, and the mountains of Transylvania. The Carpathians proper consist of an outer wall, which forms the frontier between Hungary and the adjacent provinces of Austria, and of an inner wall which fills the whole of Upper Hungary, and forms the central group. The outer wall is a complex, roughly circular mass of about 600 m. extending from Pressburg to the valley of the Visó, and the Golden Bistritza, and is divided by the Poprad into two parts, the western Carpathians and the eastern or wooded Carpathians. Orographically, therefore, the proper Carpathians are divided into: (*a*) the western Carpathians, (*b*) the eastern or wooded Carpathians, and (*c*) the central groups.

Ranges.

(*a*) The western Carpathians, which begin at the *Porta Hungarica* on the Danube, just opposite the Leitha Mountains, and extend to the Poprad river, are composed of four principal groups: the Little Carpathians (also called the Pressburg group) with the highest peak Bradlo (2670 ft.); the White Carpathians or Miava group, with the highest peak Javornik (3325 ft.), and the Zemerka (3445 ft.); the Beskid proper or western Beskid group, which extends from a little west of the Jablunka pass to the river Poprad, with the highest peaks, Beskid (3115 ft.), Smrk (4395 ft.), Lissa Hora (4350 ft.) and Ossus (5106 ft.); and the Magura or Arva Magura group, which extends to the south of Beskid Mountains, and contains the Babia Gora (5650 ft.), the highest peak in the whole western Carpathians.

(*b*) The eastern or wooded Carpathians extend from the river Poprad to the sources of the river Visó and the Golden Bistritza, whence the Transylvanian Mountains begin, and form the link between these mountains and the central groups or High Carpathians. They are a monotonous sandstone range, covered with extensive forests, which up to the sources of the rivers Ung and San are also called the eastern Beskids, and are formed of small parallel ranges. The northern two-thirds of this range has a mean altitude of 3250 ft., and only in its southern portion it attains a mean altitude of 5000 ft. The principal peaks are Rusky Put (4264 ft.), Popadjé (5690 ft.), Bistra (5936 ft.), Pop Ivan (6214 ft.), Tomnatik (5035 ft.), Giumaleu (6077 ft.) and Cserna Gora (6505 ft.), the culminating peak of the whole range. To the eastern Carpathians belongs also the range of mountains extending between the Laborcza and the Upper Theiss, called Vihorlat, which attains in the peak of the same name an altitude of 3495 ft. As indicated by its name, which means “burnt,” it is of volcanic origin, and plays an important part in the folklore and in the superstitious legends of the Hungarian people.

(*c*) The central groups or the High Carpathians extend from the confluence of the rivers Arva and Waag to the river Poprad, and include the highest group of the Carpathian system. They consist of the High Tatra group (see Tatra Mountains), where is found the Gerlsdorfer or Franz Josef peak (Hung. *Gerlachfalvi-Csúcs*), with an altitude of 8737 ft., the highest peak in the whole Carpathian Mountains. On its west are the Liptauer Magura, with the highest peak the Biela Szkala (6900 ft.), and on its east are the Zipser Magura, which have a mean altitude of 3000 ft. South of the central groups lies a widely extending mountain region, which fills the whole of northern Hungary, and is known as the Hungarian highland. It is composed of several groups, which are intersected by the valleys of numerous rivers, and which descend in sloping terraces towards the Danube and the Hungarian plain. The principal groups are: the Neutra or Galgóc Mountains (4400 ft.), between the rivers Waag and Neutra; the Low or Nizna Tatra, which extends to the south of the High Tatra, and has its highest peaks, the Djumbir (6700 ft.) and the Králova Hola (6400 ft.); this group is continued

towards the east up to the confluence of the Göllnitz with the Hernad, by the so-called Carpathian foot-hills, with the highest peak the Zelesznik (2675 ft.). West of the Low Tatra extend the Fatra group, with the highest peak, the Great Fatra (5825 ft.), to the south and east of which lie the Schemnitz group, the Ostrowsky group, and several other groups, all of which are also called the Hungarian Ore Mountains, on account of their richness in valuable ores. South-east of the Low Tatra extend the Zips—Gömör Ore Mountains, while the most eastern group is the Hegyalja Mountains, between the Topla, Tarcza and Hernad rivers, which run southward from Eperjes to Tokaj. In their northern portion, they are also called Sóvár Mountains, and reach in their highest peak, Simonka, an altitude of 3350 ft., while their southern portion, which ends with the renowned Tokaj Hill (1650 ft.), is also called Tokaj Mountains. The smaller groups of the Hungarian highland are: on the south-west the Neograd Mountains (2850), whose offshoots reach the Danube; to the east of them extends the Matra group, with the highest peak the Saskö (3285 ft.). The Matra group is of volcanic origin, rising abruptly in the great Hungarian plain, and constitutes one of the most beautiful groups of the Carpathians; lastly, to its east extend the thickly-wooded Bükk Mountains (3100 ft.).

Lakes.

Throughout the whole of the Carpathian system there are numerous mountain lakes, but they cannot compare with the Alpine lakes either in extension or beauty. The largest and most numerous are found in the Tatra Mountains. These lakes are called by the people “eyes of the sea,” through their belief that they are in subterranean communication with the sea.

Passes.

The western and central Carpathians are much more accessible than the eastern Carpathians and the Transylvanian Mountains. The principal passes in the western Carpathians are: Strany, Hrozinkau, Wlara, Lissa and the Jablunka pass (1970 ft.), the principal route between Silesia and Hungary, crossed by the Breslau-Budapest railway; and the Jordanow pass. In the central Carpathians are: the road from Neumarkt to Késmárk through the High Tatra, the Telgárt pass over the Králova Hola from the Poprad to the Gran, and the Tylicz pass from Bartfeld to Tarnow. In the eastern Carpathians are: the Dukla pass, the Mezo-Laborcz pass crossed by the railway from Tokaj to Przemysl; the Uszok pass, crossed by the road from Ungvár to Sambor; the Vereczke pass, crossed by the railway from Lemberg to Munkács; the Delatyn or Körösmezö pass (3300 ft.), also called the Magyar route, crossed by the railway from Kolomea to Debreczen; and the Stiol pass in Bukovina.

Geology.

The Carpathians consist of an outer zone of newer beds and an inner zone of older rocks. Between the two zones lies a row of *Klippen*, while towards the Hungarian plain the inner zone is bordered by a fringe of volcanic eruptions of Tertiary age. The *outer zone* is continuous throughout the whole extent of the chain, and is remarkably uniform both in composition and structure. It is formed almost entirely of a succession of sandstones and shales of Cretaceous and Tertiary age—the so-called Carpathian Sandstone—and these are thrown into a series of isoclinal folds dipping constantly to the south. The folding of this zone took place during the Miocene period. The *inner zone* is not continuous, and is much more complex in structure. It is visible only in the west and in the east, while in the central Carpathians, between the Hernad and the headwaters of the Theiss, it is lost beneath the modern deposits of the Hungarian plain. In the western Carpathians the inner zone consists of a foundation of Carboniferous and older rocks, which were folded and denuded before the deposition of the succeeding strata. In the outer portion of the zone the Permian and Mesozoic beds are crushed and folded against the core of ancient rocks; in the inner portion of the zone they rest upon the old foundation with but little subsequent disturbance. In the eastern Carpathians also, the Permian and Mesozoic beds are not much folded except near the outer margin of the zone. The *Klippen* are isolated hills, chiefly of Jurassic limestone, rising up in the midst of the later and softer deposits on the inner border of the sandstone zone. Their relations to the surrounding beds are still obscure. They may be “rootless” masses brought upon the top of the later beds by thrustplanes. They may be the pinched-up summits of sharp anticlinals, which in the process of folding have been forced through the softer rocks which lay upon them. Or, finally, they may have been islands rising above the waters, in which were deposited the later beds which now surround them. The so-called *Klippen* of the Swiss Alps are now usually supposed to rest upon thrustplanes, but they are not strictly analogous, either in structure or in position, with those of the Carpathians. Of all the peculiar features of the Carpathian chain, perhaps the most remarkable is the fringe of volcanic rocks which lies along its inner margin. The outbursts began in the later part of the Eocene period, and continued into the Pliocene, outlasting the period of folding. They appear to be associated with faulting upon the inner margin of the chain. Trachytes, rhyolites, andesites and basalts occur, and a definite order of succession has been made out in several areas; but this order is not the same throughout the chain.

The Carpathians, like the Alps, form a protective wall to the regions south of them, which

enjoy a much milder climate than those situated to the north. The vegetation of these regions is naturally subjected to the different climateric conditions. The mountains themselves are mostly covered with forests, and their vegetation presents four zones: that of the beech extends to an altitude of 4000 ft.; that of the Scottish fir to 1000 ft. higher. Above this grows a species of pine, which becomes dwarfed and disappears at an altitude of about 6000 ft., beyond which is a zone of lichen and moss covered or almost bare rock. The highest parts in the High Tatra and in the Transylvanian Mountains have a flora similar to that of the Alps, more specially that of the middle region. Remarkable is the sea-shore flora, which is found in the numerous salt-impregnated lakes, ponds and marshes in Transylvania. As regards the fauna, the Carpathians still contain numerous bears, wolves and lynxes, as well as birds of prey. It presents a characteristic feature in its mollusc fauna, which contains many species not found in the neighbouring regions, and only found in the Alpine region. Cattle and sheep are pastured in great numbers on its slopes.

Climate, Flora, Fauna.

The Carpathian system is richer in metallic ores than any other mountain system of Europe, and contains large quantities of gold, silver, copper, iron, lead, coal, petroleum, salt, zinc, &c., besides a great variety of useful mineral. A great number of mineral springs and thermal waters are found in the Carpathians, many of which have become frequented watering-places.

Minerals.

The systematic and scientific exploration of the Carpathians dates only from the beginning of the 19th century. The first ascension of the Lomnitzer peak in the High Tatra was made by one David or Johann Fröhlich in 1615. The first account of the Tatra Mountains was written by Georg Buchholz, a resident of Kesmark in 1664. The English naturalist, Robert Townson, explored the Tatra in 1793 and 1794, and was the first to make a few reliable measurements. The results of his exploration appeared in his book, *Travels in Hungary*, published in 1797. But the first real important work was undertaken by the Swedish naturalist, Georg Wablenberg (1780-1851), who in 1813 explored the central Carpathians as a botanist, but afterwards also made topographical and geological studies of the system. The results of all the former explorations were embodied by A. von Sydow in an extensive work published in 1827. During the 19th century the measurements of the various parts of the Carpathians was undertaken by the ordnance survey of the Austrian army, which published their first map of the central Carpathians in 1870. A great stimulus to the study of this mountain system was given by the foundation of the Hungarian Carpathian Society in 1873, and a great deal of information has been added to our knowledge since. In 1880 two new Carpathian societies were formed: a Galician and a Transylvanian.

History.

AUTHORITIES.—F.W. Hildebrandt, *Karpathenbilder* (Glogau, 1863); E. Sagorski and G. Schneider, *Flora Carpatorum Centralium* (2 vols., Leipzig, 1891); Muriel Dowie, *A Girl in the Carpathians* (London, 1891); *Orohydrographisches Tableau der Karpathen* (Vienna, 1886), in six maps of scale 1 : 750,000; V. Uhlig, “Bau und Bild der Karpaten,” in *Bau und Bild Österreichs* (Vienna, 1903).

(O. BR.; P. LA.)

1 The name is derived from the Slavonic word *Chrb*, which means mountain-range. As *Chrawat*, it was first applied to the inhabitants of the region, whence it passed in the form *Krapat* or *Karpa* as the name of mountain system. In official Hungarian documents of the 13th and 14th centuries the Carpathians are named Thorchal or Tarczal, and also *Montes Nivium*.

CARPATHUS (Ital. *Scarpanto*), an island about 30 m. south-west of Rhodes, in that part of the Mediterranean which was called, after it, the Carpathian Sea (*Carpathium Mare*). It was both in ancient and medieval times closely connected with Rhodes; it was held by noble families under Venetian suzerainty, notably the Cornari from 1306 to 1540, when it finally passed into the possession of the Turks. From its remote position Carpathus has preserved many peculiarities of dress, customs and dialect, the last resembling those of Rhodes and Cyprus.

See L. Ross, *Reisen auf den gr. Inseln* (Halle, 1840-1845); T. Bent, *Journal of Hellenic Studies*, vi. (1885), p. 235; R.M. Dawkins, *Annual of British School at Athens*, ix. and x.

CARPEAUX, JEAN BAPTISTE (1827-1875), French sculptor, was born at Valenciennes, France, on the 11th of May 1827. He was the son of a mason, and passed his early life in extreme poverty. In 1842 he came to Paris, and after working for two years in a drawing-school, was admitted to the École des Beaux-Arts on the 9th of September 1854. The Grand Prix de Rome was awarded to his statue of “Hector bearing in his arms his son Astyanax.” His first work exhibited at the Salon, in 1853, did not show the spirit of an innovator, and was very unlike the work of his master Rude. At Rome he was fascinated by Donatello, and yet more influenced by Michelangelo, to whom he owes his feeling for vehement and passionate action. He sent from Rome a bust, “La Palombella,” 1856; and a “Neapolitan Fisherman,” 1858. This work was again exhibited in the Salon of 1859, and took a second-class medal; but it was not executed in marble till 1863. In his last year in Rome he sent home a dramatic group, “Ugolino and his Sons,” and exhibited at the same time a “Bust of Princess Mathilde.” This gained him a second-class medal and the favour of the Imperial family. In 1864 he executed the “Girl with a Shell,” the companion figure to the young fisherman; and although in 1865 he did not exhibit at the Salon, busts of “Mme. A.E. André,” of “Giraud” the painter, and of “Mlle. Benedetti” showed that he was not idle. He was working at the same time on the decorations of the Pavilion de Flore, of which the pediment alone was seen at the Salon, though the bas-relief below is an even better example of his style. After producing a statue of the prince imperial, Carpeaux was made chevalier of the Legion of Honour in 1866. Two years later he received an important commission to execute one of the four groups for the façade of the new opera house. His group, representing “Dancing,” 1869, was greeted with indignant protests; it is nevertheless a sound work, full of movement, with no fault but that of exceeding the limitations prescribed. In 1869 he exhibited a “Bust of M. Gamier,” and followed this up with two pieces intended for his native city: a statue of Watteau, and a bas-relief, “Valenciennes repelling Invasion.” During the Commune he came to England, and made a “Bust of Gounod” in 1871. His last important work was a fountain, the “Four Quarters of the World,” in which the globe is sustained by four female figures personifying Europe, Asia, Africa and America. This fountain is now in the Avenue de l’Observatoire in Paris. Carpeaux, though exhausted by illness, continued designing indefatigably, till he died at the Château de Bécon, near Courbevoie, on the 12th of October 1875, after being promoted to the higher grade of the Legion of Honour. Many of his best drawings have been presented by Prince Stirbey to the city of Valenciennes.

See Ernest Chesneau, *Carpeaux, sa vie et son oeuvre* (Paris, 1880); Paul Foucart, *Catalogue du Musée Carpeaux, Valenciennes* (Paris, 1882); Jules Claretie, *J. Carpeaux* (1882); François Bournand, *J.B. Carpeaux* (1893).

CARPENTARIA, GULF OF, an extensive arm of the sea deeply indenting the north coast of Australia, between 10° 40′ and 17° 40′ S., and 135° 30′ and 142° E. Its length is 480 m. and its extreme breadth (E. to W.) 420 m. It is bounded E. by Cape York Peninsula, and W. by the Northern Territory of South Australia. Near its southern extremity is situated a group of islands called Wellesley; and towards the western side are the Sir Edward Pellew Islands, the Groote Eylandt and others. A large number of rivers find their way to the gulf, and some are of considerable size. On the eastern side there is the Mitchell river; at the south-east corner the Gilbert, the Norman, the Flinders, the Leichhardt and the Gregory; and on the west the Roper river. Jan Carstensz, who undertook a voyage of discovery in this part of the globe in 1623, gave the name of Carpentier to a small river near Cape Duyfhen in honour of Pieter Carpentier, at that time governor-general of the Dutch East Indies; and after the second voyage of Abel Tasman in 1644, the gulf, which he had successfully explored, began to appear on the charts under its present designation.

CARPENTER, LANT (1780-1840), English Unitarian minister, was born at Kidderminster on the 2nd of September 1780, the son of a carpet manufacturer. After some months at a non-conformist academy at Northampton, he proceeded to Glasgow University, and then joined the ministry. After a short time as assistant master at a Unitarian school near

Birmingham, he was in 1802 appointed librarian at the Liverpool Athenaeum. In 1805 he became pastor of a church in Exeter, removing in 1817 to Bristol. At both Bristol and Exeter he was also engaged in school work, among his Bristol pupils being Harriet and James Martineau. Carpenter did much to broaden the spirit of English Unitarianism. The rite of baptism seemed to him a superstition, and he substituted for it a form of infant dedication. His health, undermined by his constant labours, broke down in 1839, and he was ordered to travel. He was drowned on the night of the 5th of April 1840, having been washed overboard from the steamer in which he was travelling from Leghorn to Marseilles.

CARPENTER, MARY (1807-1877), English educational and social reformer, was born on the 3rd of April 1807 at Exeter, where her father, Dr Lant Carpenter, was Unitarian minister. In 1817 the family removed to Bristol, where Dr Carpenter was called to the ministry of Lewin's Mead Meeting. As a child Mary Carpenter was unusually earnest, with a deep religious vein and a remarkable thoroughness in everything she undertook. She was educated in her father's school for boys, learning Latin, Greek and mathematics, and other subjects at that time not generally taught to girls. She early showed an aptitude for teaching, taking a class in the Sunday school, and afterwards helping her father with his pupils. When Dr Carpenter gave up his school in 1829, his daughters opened a school for girls under Mrs Carpenter's superintendence. In 1833 the raja Rammohun Roy visited Bristol, and inspired Miss Carpenter with a warm interest in India; and Dr Joseph Tuckerman of Boston about the same time aroused her sympathies for the condition of destitute children. Her life-work began with her taking part in organizing, in 1835, a "Working and Visiting Society," of which she was secretary for twenty years. In 1843 her interest in negro emancipation was aroused by a visit from Dr S.G. Howe. Her interest in general educational work was also growing. A bill introduced in this year "to make provision for the better education of children in manufacturing districts," as a first instalment of a scheme of national education, failed to pass, largely owing to Nonconformist opposition, and private effort became doubly necessary. So-called "Ragged Schools" sprang up in many places, and Miss Carpenter conceived the plan of starting one in Lewin's Mead. To this was added a night-school for adults. In spite of many difficulties this was rendered a success, chiefly owing to Miss Carpenter's unwearied enthusiasm and remarkable organizing power. In 1848 the closing of their own private school gave Miss Carpenter more leisure for philanthropic and literary work. She published a memoir of Dr Tuckerman, and a series of articles on ragged schools, which appeared in the *Inquirer* and were afterwards collected in book form. This was followed in 1851 by *Reformatory Schools for the Children of the Perishing and Dangerous Classes, and for Juvenile Offenders*. She sketched out three classes of schools as urgently needed:—(1) good free day-schools; (2) feeding industrial schools; (3) reformatory schools. This book drew public attention to her work, and from that time onwards she was drawn into personal intercourse with leading thinkers and workers. She was consulted in the drafting of educational bills, and invited to give evidence before House of Commons committees. To test the practical value of her theories, she herself started a reformatory school at Bristol, and in 1852 she published *Juvenile Delinquents, their Condition and Treatment*, which largely helped on the passing of the Juvenile Offenders Act in 1854. Now that the principle of reformatory schools was established, Miss Carpenter returned to her plea for free day-schools, contending that the ragged schools were entitled to pecuniary aid from the annual parliamentary grant. At the Oxford meeting of the British Association (1860) she read a paper on this subject, and, mainly owing to her instigation, a conference on ragged schools in relation to government grants for education was held at Birmingham (1861). In 1866 Miss Carpenter was at last able to carry out a long-cherished plan of visiting India, where she found herself an honoured guest. She visited Calcutta, Madras and Bombay, inaugurated the Bengal Social Science Association, and drew up a memorial to the governor-general dealing with female education, reformatory schools and the state of gaols. This visit was followed by others in 1868 and 1869. Her attempt to found a female normal school was unsuccessful at the time, owing to the inadequate previous education of the women, but afterwards such colleges were founded by government. A start, however, was made with a model Hindu girls' school, and here she had the co-operation of native gentlemen. Her last visit to India took place in 1875, two years before her death, when she had the satisfaction of seeing many of her schemes successfully established. At the meeting of the prison congress in 1872 she read a paper on "Women's Work in the Reformation of Women Convicts." Her work now began to attract attention abroad. Princess Alice of Hesse summoned her to Darmstadt to organize a

Women's Congress. Thence she went to Neuchâtel to study the prison system of Dr Guillaume, and in 1873 to America, where she was enthusiastically received. Miss Carpenter watched with interest the increased activity of women during the busy 'seventies. She warmly supported the movement for their higher education, and herself signed the memorial to the university of London in favour of admitting them to medical degrees. She died at Bristol on the 14th of June 1877, having lived to see the accomplishment of nearly all the reforms for which she had worked and hoped.

(A. Z.)

CARPENTER, WILLIAM BENJAMIN (1813-1885), English physiologist and naturalist, was born at Exeter on the 29th of October 1813. He was the eldest son of Dr Lant Carpenter. He attended medical classes at University College, London, and then went to Edinburgh, where he took the degree of M.D. in 1839. The subject of his graduation thesis, "The Physiological Inferences to be Deduced from the Structure of the Nervous System of Invertebrated Animals," indicates a line of research which had fruition in his *Principles of General and Comparative Physiology*. His work in comparative neurology was recognized in 1844 by his election to the Royal Society, which awarded him a Royal medal in 1861; and his appointment as Fullerian professor of physiology in the Royal Institution in 1845 enabled him to exhibit his powers as a teacher and lecturer, his gift of ready speech and luminous interpretation placing him in the front rank of exponents, at a time when the popularization of science was in its infancy. His manifold labours as investigator, author, editor, demonstrator and lecturer knew no cessation through life; but in assessing the value of his work, prominence should be given to his researches in marine zoology, notably in the lower organisms, as Foraminifera and Crinoids. These researches gave an impetus to deep-sea exploration, an outcome of which was in 1868 the "Lightning," and later the more famous "Challenger," expedition. He took a keen and laborious interest in the evidence adduced by Canadian geologists as to the organic nature of the so-called *Eozoon Canadense*, discovered in the Laurentian strata, and at the time of his death had nearly finished a monograph on the subject, defending the now discredited theory of its animal origin. He was an adept in the use of the microscope, and his popular treatise on *The Microscope and its Revelations* (1856) has stimulated a host of observers to the use of the "added sense" with which it has endowed man. In 1856 Carpenter became registrar of the university of London, and held the office for twenty-three years; on his resignation in 1879 he was made a C.B. in recognition of his services to education generally. Biologist as he was, Carpenter nevertheless made reservations as to the extension of the doctrine of evolution to man's intellectual and spiritual nature. In his *Principles of Mental Physiology* he asserted both the freedom of the will and the existence of the "Ego," and one of his last public engagements was the reading of a paper in support of miracles. He died in London, from injuries occasioned by the accidental upsetting of a spirit-lamp, on the 19th of November 1885.

CARPENTRAS, a town of south-eastern France, capital of an arrondissement in the department of Vaucluse 16 m. N.E. of Avignon by rail. Pop. (1906) town, 7775; commune, 10,721. The town stands on the left bank of the Auzon on an eminence, the summit of which is occupied by the church of St Siffrein, formerly a cathedral, and the adjoining law-court. St Siffrein, in its existing state, dates from the 15th and 16th centuries and is Gothic in style, but it preserves remains of a previous church of Romanesque architecture. The rich sculpture of the southern portal and the relics and works of art in the interior are of some interest. The law-court, built in 1640 as the bishop's palace, contains in its courtyard a small but well-preserved triumphal arch of the Gallo-Roman period. Other important buildings are the hospital, an imposing structure of the 18th century, opposite which is a statue of its founder, Malachie d'Inguimbert, bishop of Carpentras; and the former palace of the papal legate, which dates from 1640. Of the old fortifications the only survival is the Porte d'Orange, a gateway surmounted by a fine machicolated tower. Their site is now occupied by wide boulevards shaded by plane-trees. Water is brought to the town by an aqueduct of forty-eight arches, completed in 1734.

Carpentras is the seat of a sub-prefect and of a court of assizes, and has a tribunal of first instance, communal college for girls and boys, a large library and a museum. Felt hats, confectionery, preserved fruits and nails are its industrial products, and there are silk-works, tanneries and dye-works. There is trade in silk, wool, fruit, oil, &c. The irrigation-canal named after the town flows to the east of it (see VAUCLUSE).

Carpentras is identified with *Carpentoracte*, a town of Gallia Narbonensis mentioned by Pliny, which appears to have been of some importance during the Roman period. Its medieval history is full of vicissitudes; it was captured and plundered by Vandal, Lombard and Saracen. In later times, as capital of the Comtat Venaissin, it was frequently the residence of the popes of Avignon, to whom that province belonged from 1228 till the Revolution. Carpentras was the seat of a bishopric from the 5th century till 1805.

CARPENTRY, the art and work of a carpenter (from Lat. *carpentum*, a carriage), a workman in wood, especially for building purposes. The labour of the sawyer is applied to the division of large pieces of timber or logs into forms and sizes to suit the purposes of the carpenter and joiner. His working-place is called a sawpit, and his most important tool is a pit-saw. A cross-cut saw, axes, dogs, files, compasses, lines, lampblack, blacklead, chalk and a rule may also be regarded as necessary to him. But this method of sawing timber is now only used in remote country places, and in modern practice logs, &c., are converted into planks and small pieces at saw-mills, which are equipped with modern machinery to drive all kinds of circular saws by electricity, steam or gas.

Carpentry or carpenters' work has been divided into three principal branches—descriptive, constructive and mechanical. The first shows the lines or method for forming every species of work by the rules of geometry; the second comprises the practice of reducing the timber into particular forms, and joining the forms so produced in such a way as to make a complete whole according to the intention or design; and the third displays the relative strength of the timbers and the strains to which they are subjected by their disposition. Here we have merely to describe the practical details of the carpenter's work in the operations of building. He is distinguished from the joiner by his operations being directed to the mere carcass of a building, to things which have reference to structure only. Almost everything the carpenter does to a building is absolutely necessary to its stability and efficiency, whereas the joiner does not begin his operations until the carcass is complete, and every article of joiners' work might at any time be removed from a building without undermining it or affecting its most important qualities. Certainly in the practice of building a few things do occur regarding which it is difficult to determine to whose immediate province they belong, but the distinction is sufficiently broad for general purposes.

The carpenter frames or combines separate pieces of timber by scarfing, notching, cogging, tenoning, pinning and wedging, &c. The tools he uses are the rule, axe, adze, saws, mallet, hammers, chisels, gouges, augers, pincers, set squares, bevel, compasses, gauges, level, plumb rule, jack, trying and smoothing planes, rebate and moulding planes, and gimlets and wedges. The carpenter has little labour to put on to the stuff; his chief work consists in fixing and cutting the ends of timbers, the labour in preparing the timber being done by machinery.

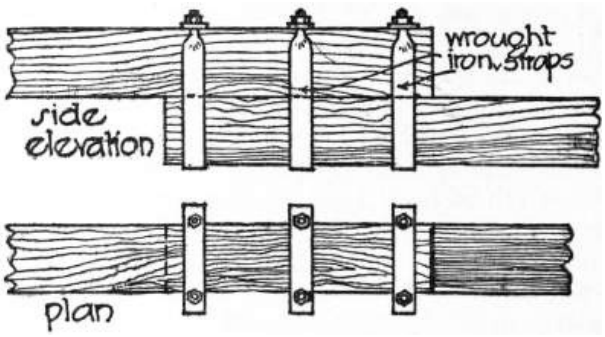


FIG. 1.—Lapped Joint.

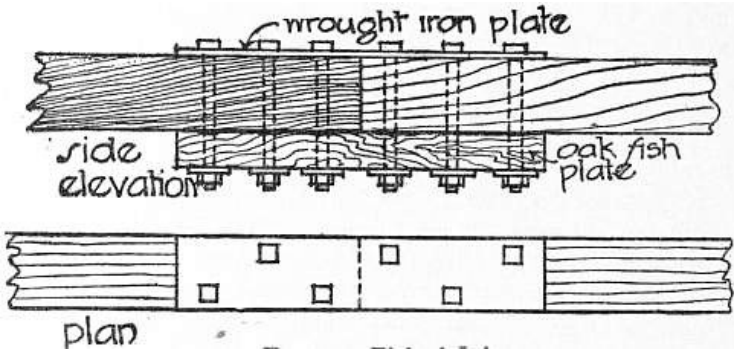
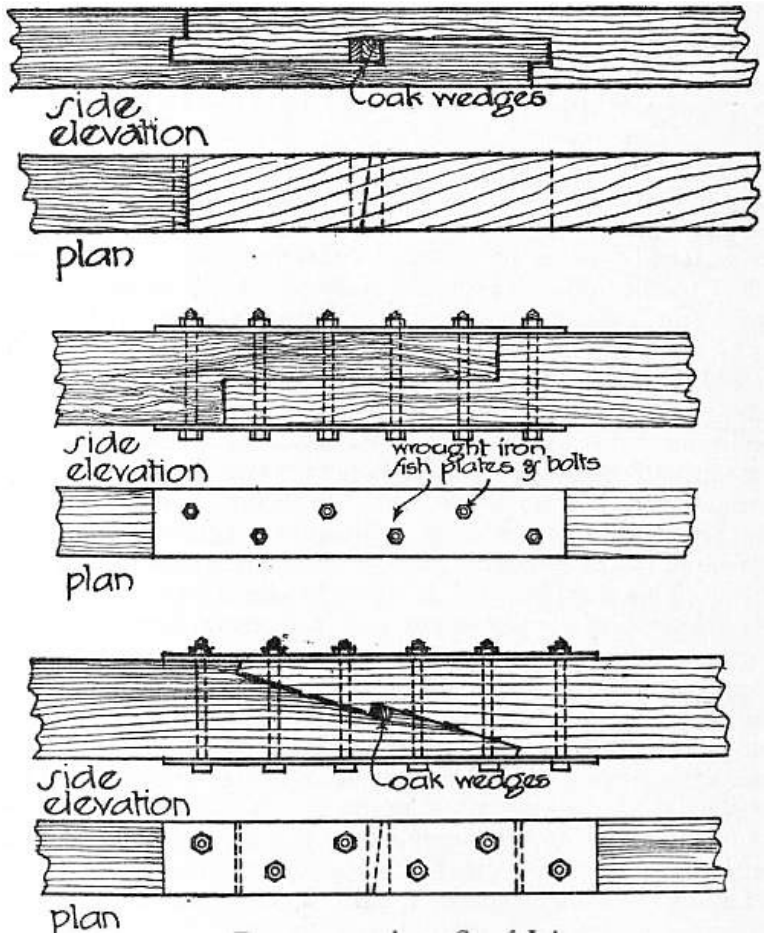


FIG. 2.—Fished Joint.



FIGS. 3, 4 and 5.—Scarf Joints.

Joints.—The joints in carpentry are various, and each is designed according to the thrust or strain put upon it. Those principally used are the following: lap, fished, scarf, notching, cogging, dovetailing, housing, halving, mortice and tenon, stub tenon, dovetailed tenon, tusk tenon, joggle, bridle, foxtail wedging, mitre, birdsmouth, built-up, dowel. Illustrations are given of the most useful joints in general use, and these, together with the descriptions, will enable a good idea to be formed of their respective merits and methods of application.

The lapped joint (fig. 1) is used for temporary structures in lengthening timbers and is secured with iron straps and bolts; a very common use of the lap joint is seen in scaffolding secured with cords and wedges.

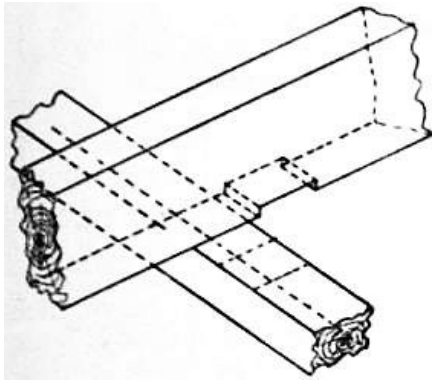


FIG. 6.—Notching.

The fished joint (fig. 2) is used for lengthening beams and is constructed by butting the ends of two pieces of timber together with an iron plate on top and bottom, and bolting through the timber; these iron connecting-plates are usually about 3 ft. long and ¼ in. and ½ in. in thickness. This joint provides a good and cheap method of accomplishing its purpose.

The scarf joint (figs. 3, 4 and 5) is used for lengthening beams, and is made by cutting and notching the ends of timbers and lapping and fitting and bolting through. This method cuts into the timber, but is very strong and neat; in addition for extra strong work an iron fish-plate is used as in the fished joint.

The ends of floor joints and rafters are usually *notched* (fig. 6) over plates to obtain a good bearing and bring them to the required levels. Where one timber crosses another as in purlins, rafters, wood floor girders, plates, &c, both timbers are notched so as to fit over each other; this *cogging* (fig. 7) serves instead of fastenings. The timbers are held together with a spike. In this way they are not weakened, and the joint is a very good one for keeping them in position.

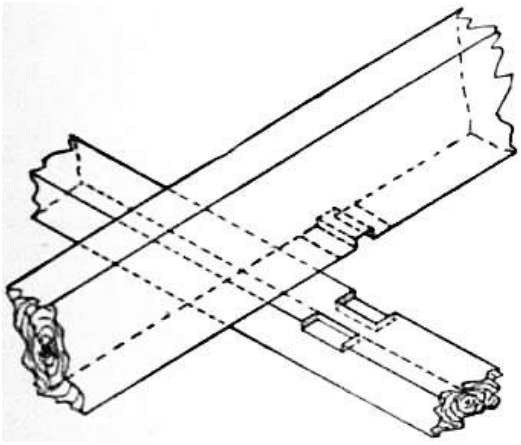


FIG. 7.—Cogging.

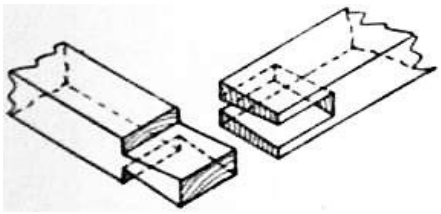


FIG. 8.—Dovetail.

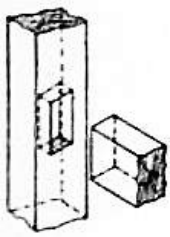


FIG. 9.—Housing.

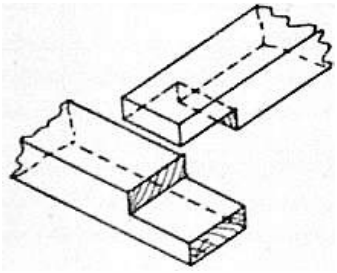


FIG. 10.—Halving.

Dovetailing (fig. 8) is used for connecting angles of timber together, such as lantern curbs or linings, and is the strongest form. When an end of timber is let entirely into another timber it is said to be *housed* (fig. 9). Where timbers cross one another and require to be flush on one or both faces, sinkings are cut in each so as to fit over each other (*halving*); these can either be square (fig. 10), bevelled (fig. 11) or dovetailed sinkings (fig. 12). The end of one piece of timber cut so as to leave a third of the thickness forms a *tenon*, and the piece of timber which is to be joined to it has a mortice or slot cut through it to receive the tenon; the two are then wedged or pinned with wood pins (fig. 13).

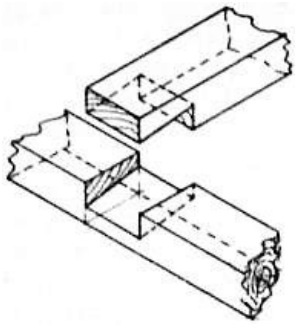


FIG. 11.—Bevelled Halving.

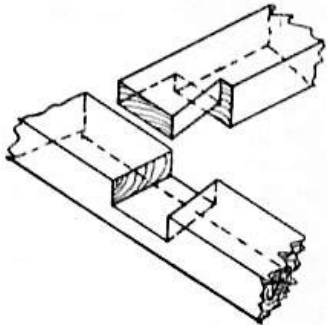


FIG. 12.—Dovetailed Halving.

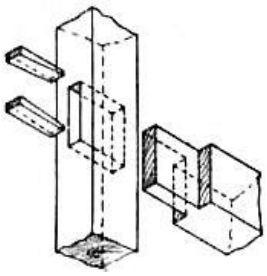


FIG. 13.—Mortice and Tenon.

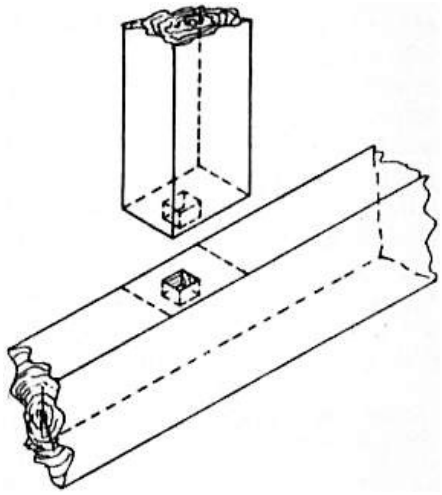


FIG. 14.—Stub Tenon or Joggle.

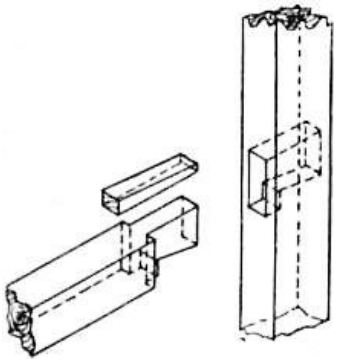


FIG. 15.—Dovetailed Tenon.

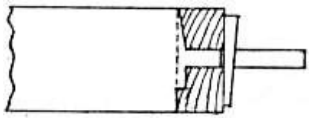


FIG. 16.—Tusk Tenon.

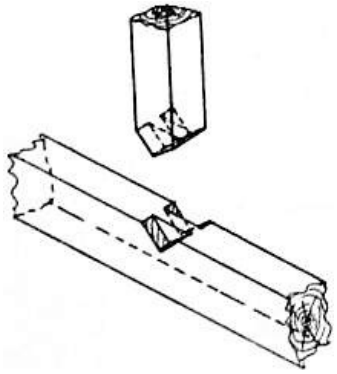


FIG. 17.—-Bridle Joint.

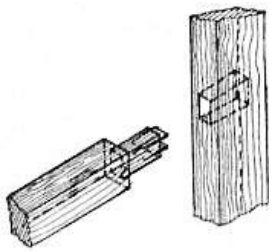


FIG. 18.—Foxtail Wedging.

A stub tenon or joggle (fig. 14) is used for fixing a post to a sill; a sinking is cut in the sill and a tenon is cut on the foot of the post to fit into the sinking to keep the post from sliding.

The purpose of a dovetailed tenon (fig. 15) is to hold two pieces of wood together with mortice and tenon so that it can be taken apart when necessary. The tenon is cut dovetail shape, and a long mortice permits the wide part of the tenon to go through, and it is secured with wood wedges. Where the floor joists or rafters are trimmed round fires, wells, &c., the tusk tenon joint (fig. 16) is used for securing the trimmer joist. It is formed by cutting a tenon on the trimmer joist and passing it through the side of the trimming joist and fixing it with a wood key. Where large timbers are tusk tenoned together, the tenons do not pass right

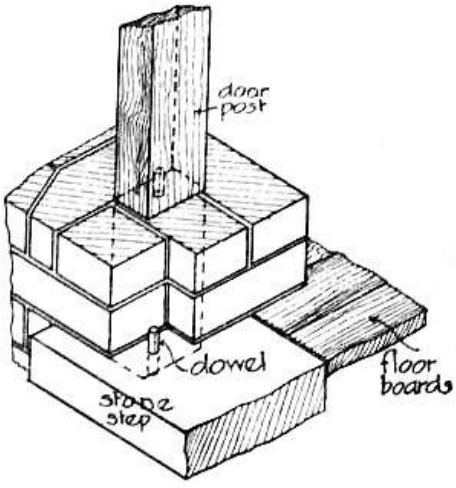


FIG. 19.—Dowelling.

through, but are cut in about 4 in. and spiked.

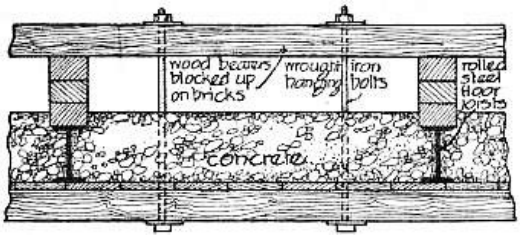


FIG. 20.—Method of supporting Centering for Concrete.

A bridle joint or birdsmouth (fig. 17) is formed by cutting one end of timber either V shape or segmental, and morticing the centre of this shaped end. Similar sinkings are cut on the adjoining timber to fit one into the other; these are secured with pins and also various other forms of fastenings. Foxtail wedging (fig. 18) is a method very similar to mortice and tenon. But the tenon does not go through the full thickness of the timber; and also on the end of the tenon are inserted two wedges, so that when the tenon is driven home the wedges split it and wedge tightly into the mortice. This joint is used mostly in joinery. The mitre is a universal joint, used for connecting angles of timber as in the case of picture frames. Built-up joints involve a system of lapping and bolting and fishing, as in the case of temporary structures, for large spans of centering for arches, and for derrick cranes. Dowels are usually 3 or 4 in. long and driven into a circular hole in the foot of a door frame or post; the other end is let into a hole in the sill (fig. 19).

Centering.—Centering is temporary timber or framing erected so as to carry concrete floors or arches of brick or stone, &c.; when the work has set the centering is removed gradually. The centering for concrete floors is usually composed of scaffold boards resting on wood bearers (fig 20). One wood bearer rests along on top of the steel joists; through this bearer long bolts are suspended, and to the bottom of these bolts a second bearer is fixed, and on the bottom bearer the scaffold boards rest. Another method, not much used now, is to fit the boards to the size of the floor and prop them up on legs, but among other disadvantages this process takes up much space and is more costly.

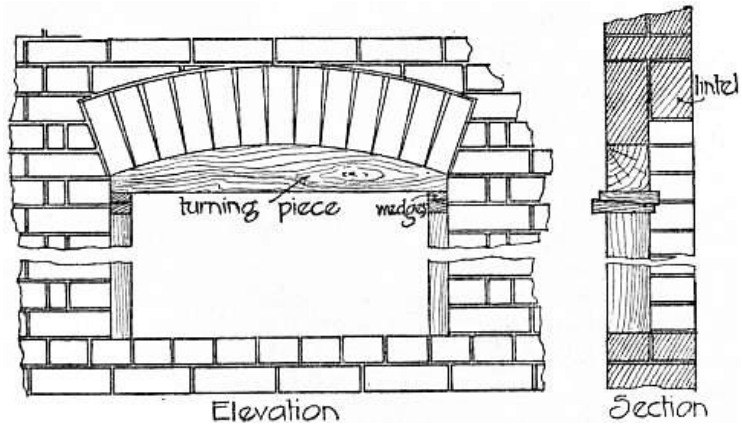


FIG. 21.

Turning piece is a name given to centering required for turning an arch over (fig. 21); it is only 4½ in. wide on the soffit or bed, and is generally cut out of a piece of 3 or 4 in. stuff, the top edge being made circular to the shape of the arch. It is kept in position whilst the arch is setting with struts from ground or sills and is nailed to the reveals, a couple of cross traces being wedged between. In the case of a semicircular or elliptical arch with 4½ in. soffit this turning piece would be constructed of ribs cut out of 4 in. stuff with ties and braces. Or the ribs could be cut out of 1 in. stuff, in which case there must be one set of ribs outside and one inside secured with ties and braces; each set of ribs when formed of thin stuff is made of two thicknesses nailed together so as to lap the joints. For spans up to 15 ft. the thin ribs would be used, and for spans above 15 ft. ribs out of 4 in. stuff and upwards. For arches with 9 in. soffit and upwards, whether segmental or semicircular or elliptical, the centres are formed with the thin ribs and laggings up to 15 ft. span; above 15 ft. with 4 in. ribs and upwards (fig. 22). The lower member of centres is called the tie, and is fixed so as to tie the extremities together and to keep the centre from spreading. Where the span is great, these ties, instead of being fixed straight, are given a rise so as to allow for access or traffic underneath. Braces are necessary to support the ribs from buckling in, and must be strong enough and so arranged as to withstand all stresses. Laggings are small pieces or strips of wood nailed on the ribs to form the surface on which to build the arch, and are spaced 1 in. apart for ordinary arches; for gauged arches they are nailed close together and the joints planed off. When centres are required to be taken down, the wedges upon which the centre rests are first removed so as to allow the arch to take its bearing gradually. Centres for brick

sewers and vault arching are formed in the same way as previously mentioned, with ribs and laggings, but the thickness of the timbers depends upon the weight to be carried.

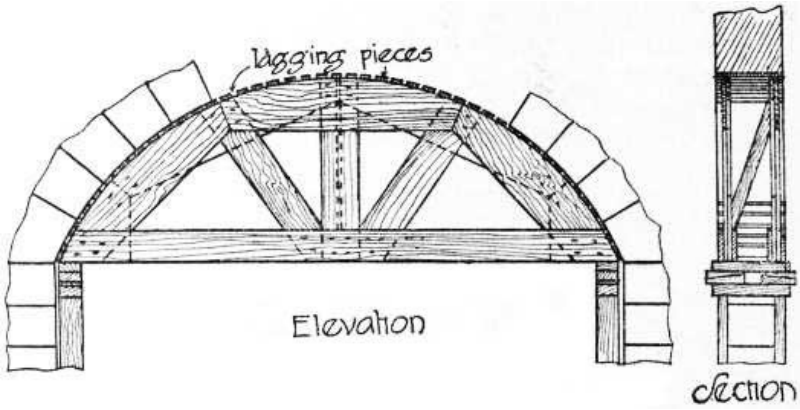


Fig. 22.—Centering for Stone Arch.

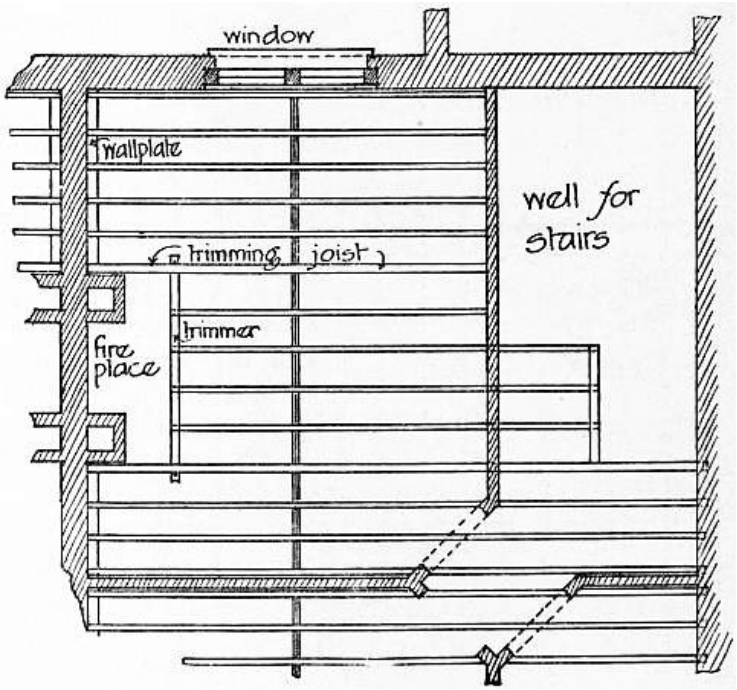


Fig. 23.—Single Floor.

Floors.—For ordinary residential purposes floors are chiefly constructed of timber. Up to about the year 1895 nearly every modern building was constructed with wood joists, but because of evidence adduced by fire brigade experts and the serious fires that have occurred fire-resisting floors have been introduced. These consist of steel girders and joists, filled in with concrete or various patented brick materials in accordance with such by-laws as those passed by the London County Council and other authorities. The majority of the floors of public buildings, factories, schools, and large residential flats are now constructed of fire-resisting materials. There are two descriptions of flooring, single and double.

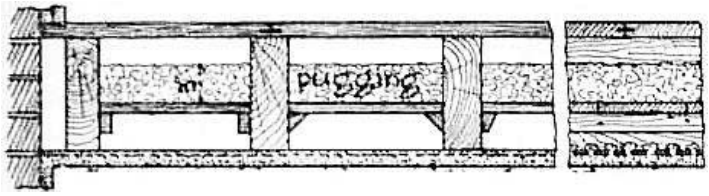


Fig. 24.—Floor pugged to resist passage of sound.

Single flooring.

Single flooring (fig. 23) consists of one row of wood joists resting on a wall or partition at each end without any intermediate support, and receiving the floor boards on the upper surface and the ceiling on the underside. Joists should never be less than 2 in. thick, or they are liable to split when the floor brads are driven in; the thickness varies from 2 to 4 in. and the depth from 5 to 11 in. (see *By-laws*, below), the distance between each joist is usually 12 in. in the clear, but

greater strength is obtained in a floor by having deep joists and placing them closer together. These floors are made firm and prevented from buckling by the use of strutting as mentioned hereafter.

The efficiency of single flooring is materially affected by the necessity which constantly occurs in practice of trimming round fireplaces and flues, and round well holes such as lifts, staircases, &c. Trimming is a method of supporting the end of a joist by tenoning it into timber crossing it; the timber so tenoned is called the trimmer joist, and the timber morticed for the tenon of the trimmer is called the trimming joist, while the intermediate timbers tenoned into the trimmer are known as the trimmed joists. This system has to be resorted to when it is impossible to get a bearing on the wall.

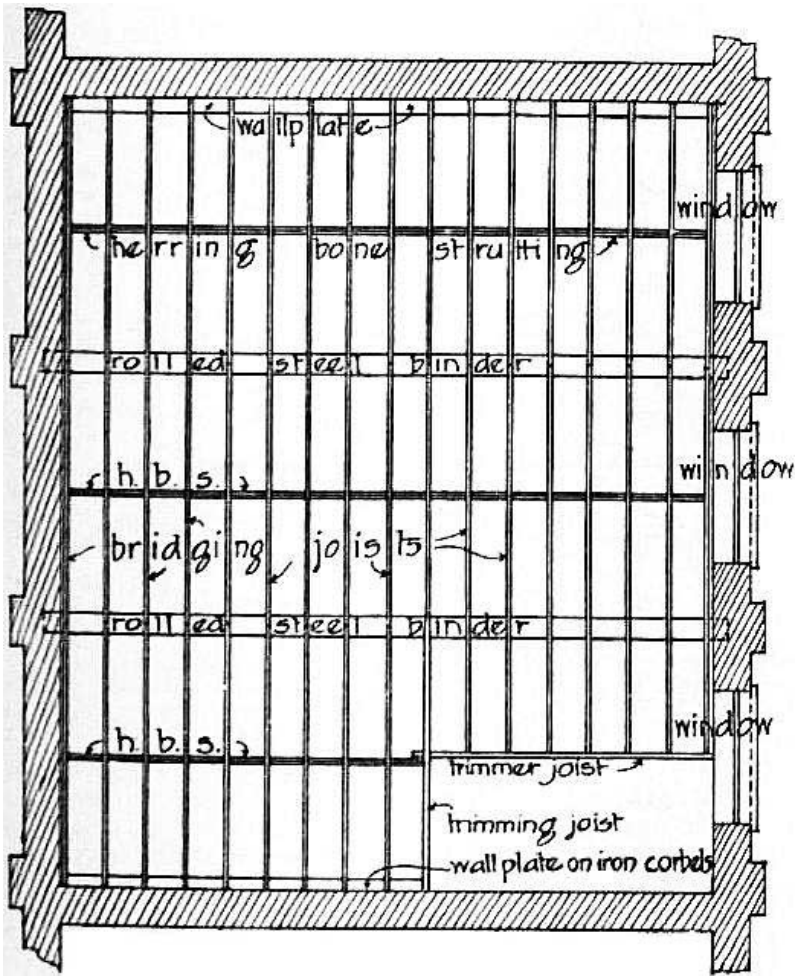


FIG. 25.—Double Floor, with Steel Binders.

A trimmer requires for the most part to be carried or supported at one or both ends by the trimming joists, and both the trimmer and the trimming joists are necessarily made stouter than if they had to bear no more than their own share of the stress. In the usual practice the trimmer and trimming joists are 1 in. thicker than the common joists, but there are special regulations and by-laws set out in the various districts and boroughs (see *By-laws*, below) to which attention must be given.

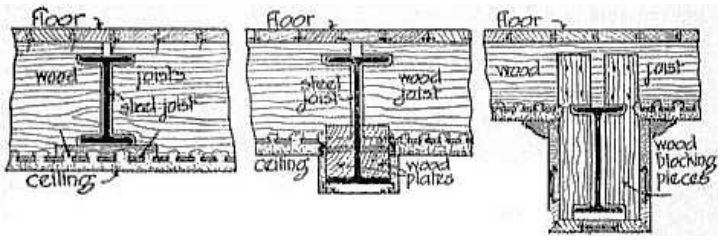


FIG. 26.

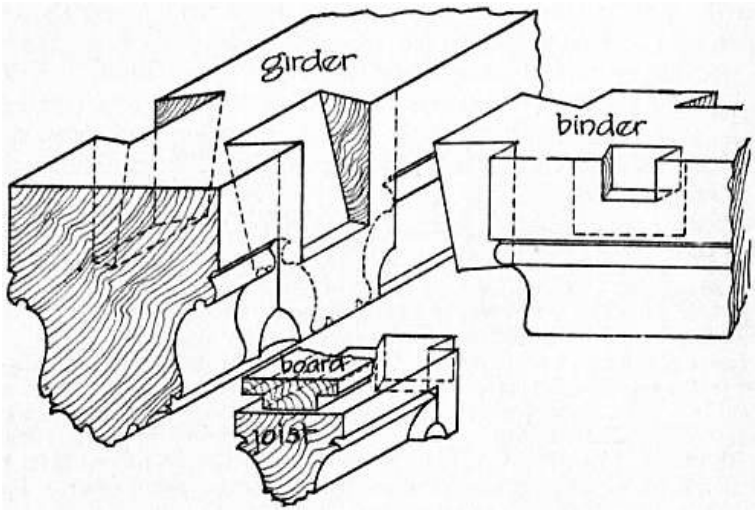


Fig. 27.—Construction of a Medieval Floor.

The principal objection to single flooring is that the sound passes through from floor to floor, so that, in some cases, conversation in one room can almost be understood in another. To stop the sound from passing through floors the remedy is to pug them (fig. 24). This consists in using rough boarding resting on fillets nailed to the sides of the joists about half-way up the depth of the joists, and then filling in on top of the boarding with slag wool usually 3 in. thick. Also to further prevent sound from passing through floors the flooring should be tongued and the ceiling should have a good thick floating coat, in poor work the stuff on ceilings is very stinted. In days gone by, ceiling joists were put at right angles to the floor joists, but this took up head room and was costly, and the arrangement is obsolete.

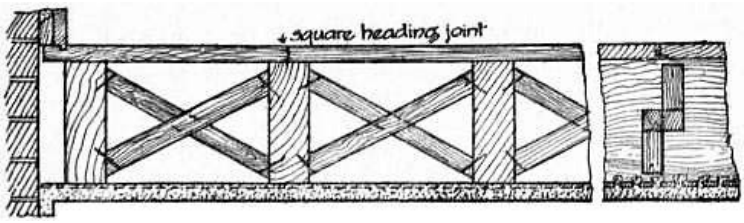


Fig. 28.—Herring-bone Strutting.

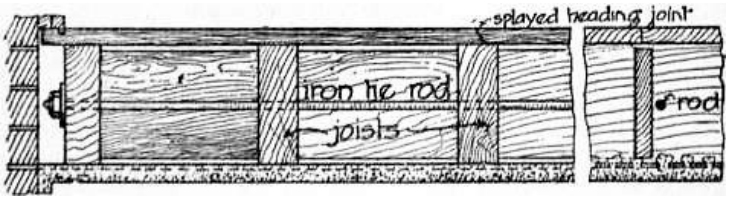


Fig. 29.—Solid Strutting.

Double flooring.

Double flooring (fig. 25) consists of single fir joists trimmed into steel girders; in earlier times a double floor consisted of fir joists called binding, bridging and ceiling joists, but these are very little used now and the single fir joists and steel girders have taken their place. Steel girders span from wall to wall, and on their flanges are bolted wood plates to receive the ends of the single joists which are notched over plates and run at right angles to the girders (fig. 26). The bearings of the joists on the wall also rest on wall plates, so as to get a level bed, and are sometimes notched over them. Wall plates, which are usually 4½ in. × 3 in. and are bedded on walls in motar, take the ends of joists and distribute the weight along the wall. The plates bolted on the side of girders are of sizes to suit the width of the flanges.

The medieval floor (fig. 27) consisted of the framed floor with wood girders, binding, bridging and ceiling joists; and the underside of all the timbers was usually wrought, the girders and binders being boldly moulded and the other timbers either square or stop chamfered.

Flooring is strengthened by the use of strutting, either herring-bone (fig. 28) or solid (fig. 29). Herring-bone strutting consists of two pieces of timber, usually 2 in. × 2 in., fixed diagonally between each joist in continuous rows, the rows being about 6 ft. apart. Solid strutting consists of 1¼ in. boards, nearly the same depth as the joists and fitted tightly

between the joists, and nailed in continuous rows 6 ft. apart. Where heavy weights are likely to be put on floors long bolts are passed through the centre of joists at the side of strutting; since this draws the strutting tightly together and does not produce any forcing stress on the walls, it is undoubtedly the best method.

Floors are usually constructed to carry the following loads (including weight of floor):—

Residences, 1¼ cwt. per foot super of floor space.

Public buildings, 1½ cwt. per foot super of floor space.

Factories, 2½ to 4 cwt. per foot super of floor space.

Local By-laws.—With regard to floor joists in domestic buildings, the following are required in the Hornsey district, in the north of London. The size of every common bearing floor joist up to 3 ft. long in clear shall be 3 in. × 2½ in.; from 3 ft. to 6 ft. in clear it shall be 4½ in. × 3 in.; from 6 ft. to 8 ft., 6½ in. × 2½ in.; from 8 ft. to 12 ft., 7 in. × 2½ in., and so on according to the clear span. The Hornsey by-laws with regard to trimmers are as follows:—A trimmer joist shall not receive more than six common joists, and the thickness of a trimming joist receiving a trimmer at not more than 3 ft. from one end and of every trimmer joist shall be ⅛th of an inch greater than the thickness for a common joist of the same bearing for every common joist carried by a trimmer. For example, if the common joists are 7 in. × 2½ in. and the trimmer has six joists trimmed into same, the size of trimmer would have to be 7 in. × 3¼ in. The Hornsey council also requires that the floor boards shall not be less than ⅞ths of an inch thick.

There is little difference in the requirements of the various localities. For example, the regulations of the Croydon council require that every common bearing joist for lengths up to 3 ft. 4 in. in clear shall be 3 in. × 2½ in.; for lengths between 3 ft. 4 in. and 5 ft. 4 in., 4 in. × 2 in.; for lengths between 5 ft. 4 in. and 7 ft. 4 in., 4 in. × 3 in.; and so on according to the clear span. The Croydon by-laws with regard to trimmers are as follows:—A trimmer joist shall not receive more than six common joists, and the thickness of a trimming joist shall be 1½ in. thicker than that for common joists of the same bearing, and the thickness of a trimmer joist shall be ¼ in. thicker for every joist trimmed into same than the common joist. For example, if the common joists are 4 in. × 3 in. the trimming joists would have to be 4 in. × 4¼ in., and the trimmer joist would have to be 4 in. × 4½ in.

Partitions.—Partitions are screens used to divide large floor spaces into smaller rooms and are sometimes constructed to carry the floors above by a system of trussing. They are built of various materials; those in use now are common stud partitions, bricknogged partitions, and solid deal and hardwood partitions, 4½ in. brick walls or bricks laid on their sides, so making a 3 in. partition, and various patent partitions such as coke breeze concrete or hollow brick partitions (see BRICKWORK), iron and wire partitions, and plaster slab partitions (see PLASTERWORK).

There are two kinds of stud or quarter partitions, common and trussed.

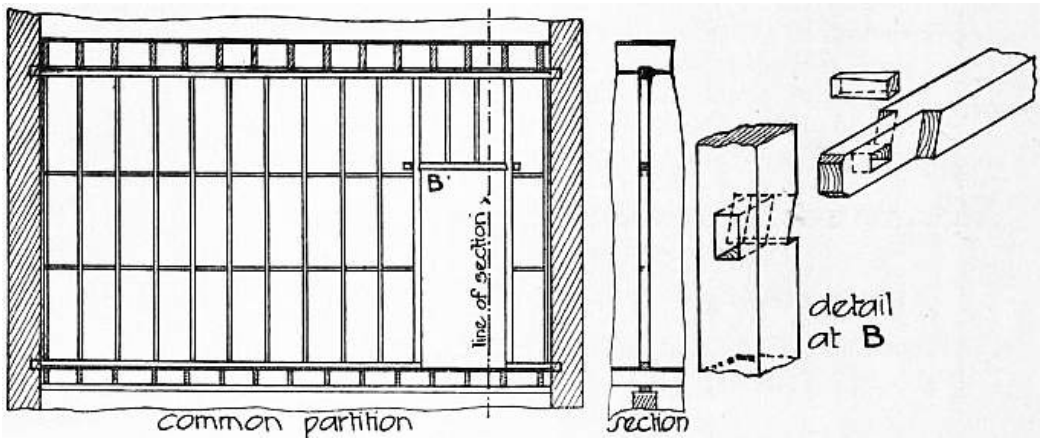


FIG. 30.—Common Partition.

Common partitions.

Common partitions (fig. 30) simply act as a screen to divide one room from another, and do not carry any weight. They weigh about 25 lb per foot superficial including plastering on both sides, and are composed of 4 in. × 3 in. head and sill and 4 in. × 2 in. upright studs; 4 in. × 2 in. nogging pieces are fitted between the studs to keep them from bending in, and are placed parallel with the head, usually 4 ft. apart. Where door-openings occur in these partitions the studs next the opening are 4 in. × 3 in. Should the floor boards have been laid, the sill of the partition would

be laid direct on them, but if the partitions are erected at the time of building the structure the sill should either rest directly over a joist, if parallel with it, or at right angles to the joists; should the position of the sill come between two joists, that is, parallel with them, then short pieces called bridging pieces of 4 in. × 2 in. stuff are wedged between the two joists and nailed to carry the sill.

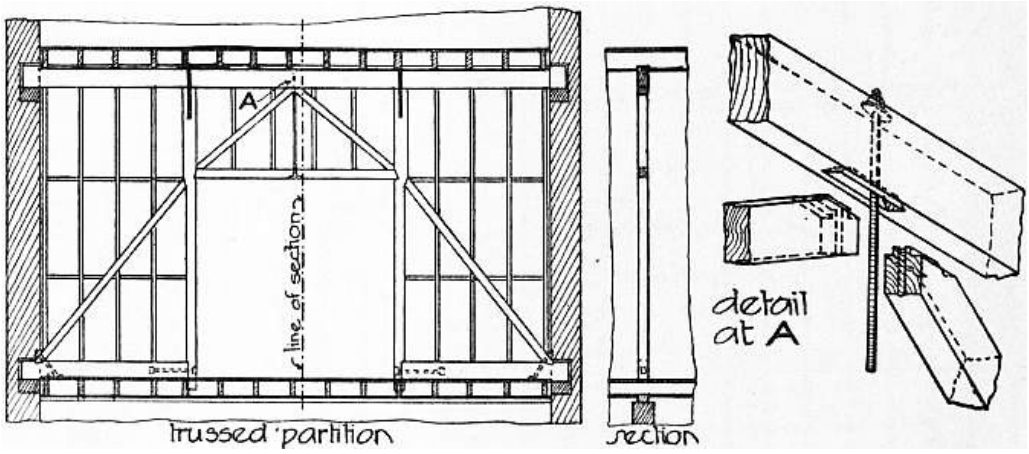


FIG. 31.—Trussed Partition.

Trussed partitions.

Trussed partitions (fig. 31) are very similar to the last, but they are so built as to carry their own weight and also to support floors, and in addition have braces; the head and sill are larger, and calculated according to the clear bearing and the weight put upon them. There are two forms of trussing, namely, queen post (fig. 32) and king post (fig. 33).

Bricknogged partitions.

Bricknogged partitions are formed in the same manner as the common stud partition, except that the studs are placed usually 18 or 27 in. apart in the clear instead of 12 in., and the 18 and 27 in. widths being multiples of a brick dimension, they are filled in with brickwork 4½ in. thick and always built in cement. These are used to prevent sound from passing from one room to another, and also to prevent fire from spreading, and are vermin-proof. Another method is to fill the space between the studs with coke breeze concrete instead of brickwork.

Timber partitions have the advantages that they are light and cheap and substantial, and the disadvantages that they are not fire-resisting or sound-resisting or vermin-proof; they should never be erected in damp positions such as the lower floors of buildings.

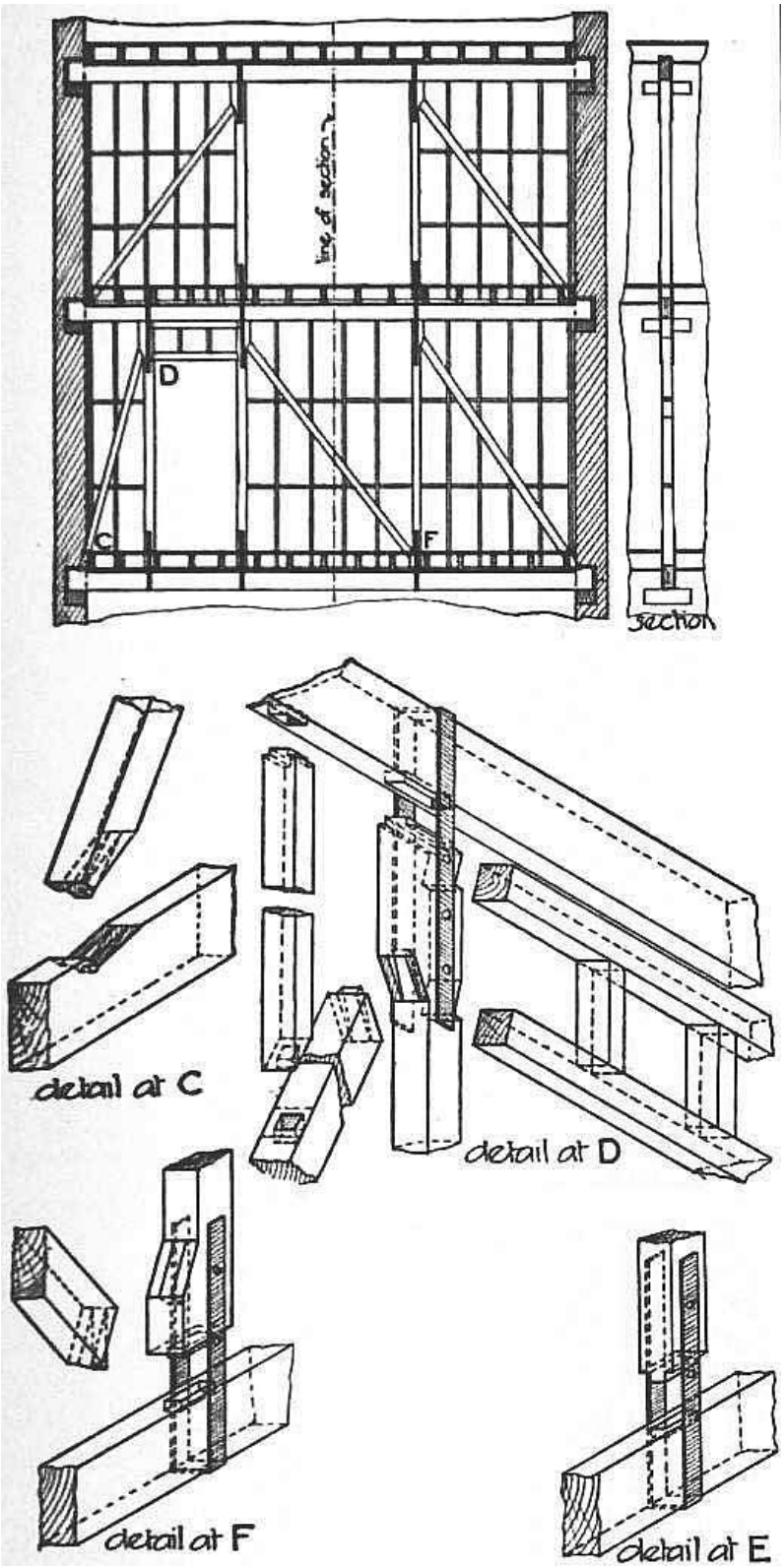


FIG. 32.—Queen Post Trussed Partition.

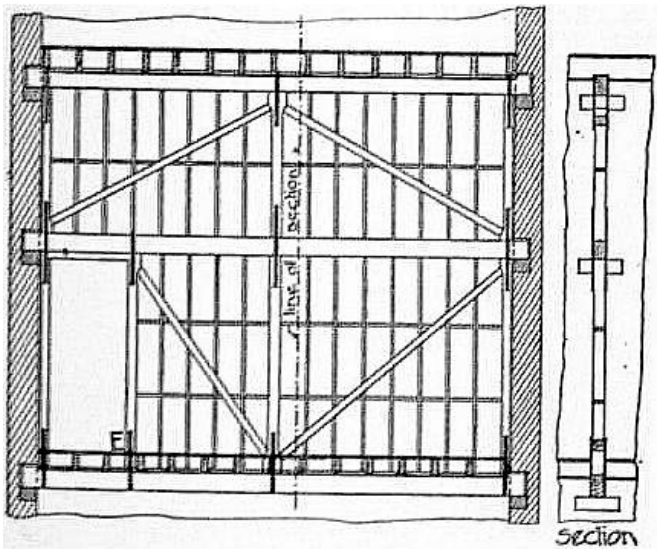


Fig. 33.—King Post Trussed Partition.

Solid wood partitions are used in offices and classrooms of schools, the upper portions usually being glazed; where these partitions enclose a staircase in a public building the London Building Act requires them to be of 2 in. hardwood, with only small panels of fire-resisting glass.

Timber Work.—Half timber work consists of a framework of timber; the upper storeys of suburban and country residences are often thus treated, and the spaces between the timbers are filled in with brickwork and plastered inside, and rough cast outside, though sometimes tiles are hung on the outside. In some instances in country places there is no filling between the timbers, and both sides are lath and plastered, and in others the timbers are solid, or facing pieces are simply plugged to the walls, the joints being pinned with hardwood pins. Half timber work (fig. 34) well designed has a very pleasing, homely and rural effect. The best and most durable wood to use is English oak worked smooth on the external face and usually painted; the by-laws of various authorities differ considerably as to the method of construction and in the restrictions as to its use. Some very fine early examples are to be seen in England, as at Holborn Bars, London, in the old parts of Bristol, and at Moreton Old Hall, near Congleton, Cheshire (see House, Plate IV. fig. 13).

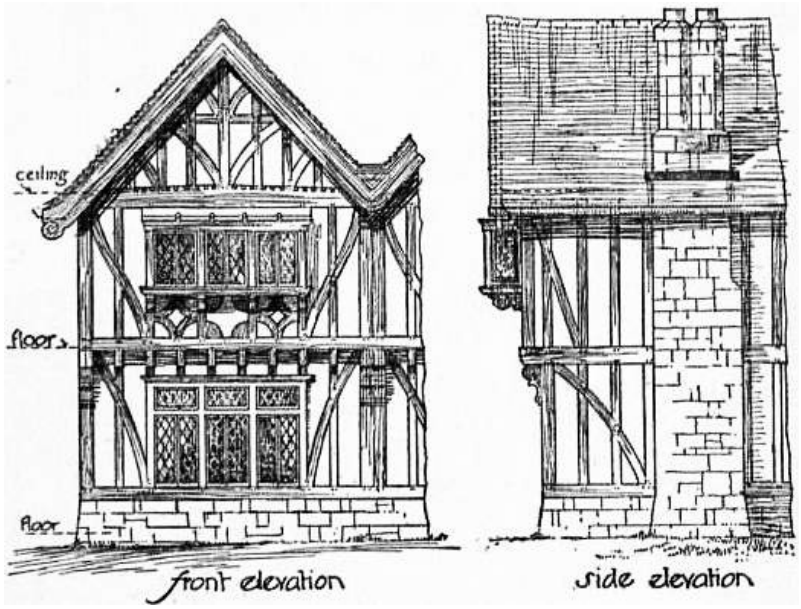


Fig. 34.—Half Timber Construction.

Timber-framed permanent buildings are not used in the towns of England, not being allowed by the by-laws. In some English villages timber bungalows are allowed, plastered inside, and either rough cast outside, or with tiles, or with sheet iron painted. At the garden city of Letchworth, in Hertfordshire, there are a few timber-framed bungalows (erected about 1904 and originally intended to be used as week-end cottages), the outsides of which are covered with sheet iron and painted. Other instances of the temporary use of this kind of building are found in soldiers’ barracks, offices and chapels.

In America and the British colonies this class of building is very largely erected on the outskirts of the cities. In American practice in framing the walls of wooden buildings two distinct methods are used and are distinguished as “braced” and “balloon.”

The Braced (fig. 35) was the only kind in use previous to about the year 1850. In this method of framing the sills, posts, girts and plates are made of heavy timber morticed and pinned together and braced with 4 in. × 4 in. or 4 in. × 6 in. braces and common studding. To frame a building in this way it is necessary to cut all the pieces and make all the mortice holes on the ground, and then fit them together and raise a whole side at a time or at least one storey of it. The common studs are only one storey high.

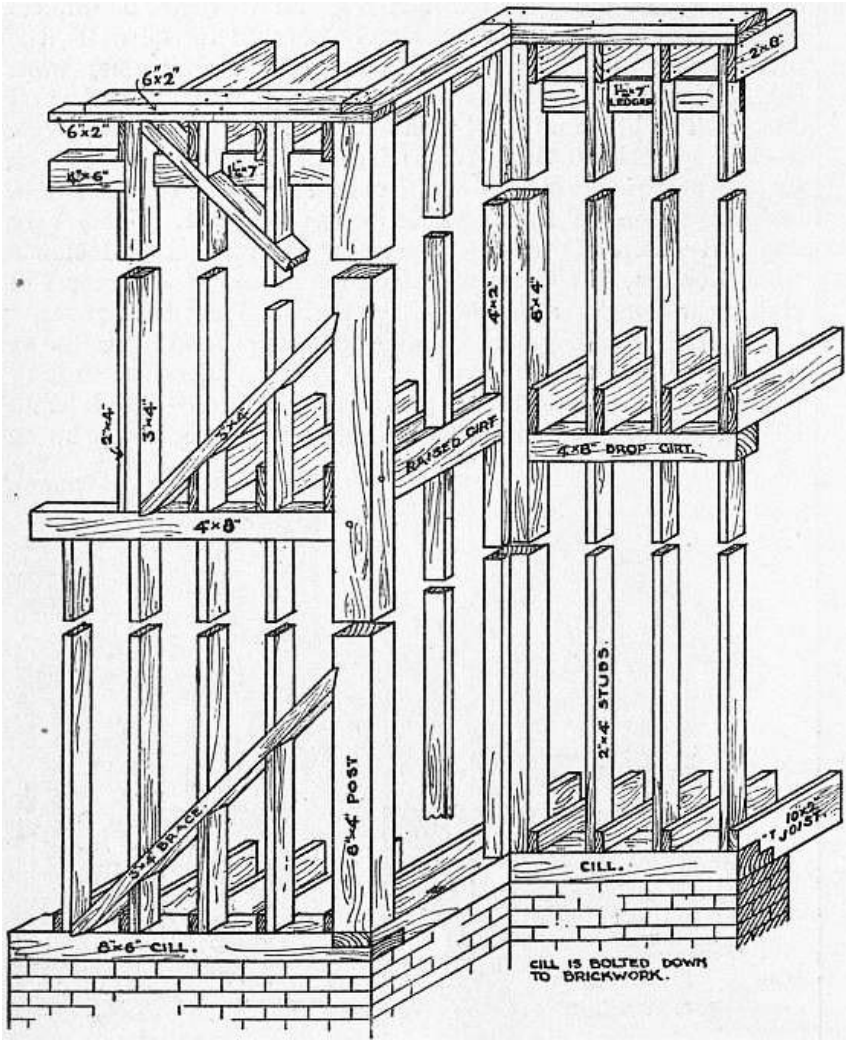


Fig. 35.—Braced Frame.

The Balloon frame (fig. 36) is composed of much smaller scantlings and is more rapidly erected and less expensive. The method is to first lay the sill, generally 4 in. × 6 in., halved at the angles. After the floor is laid, the corner posts, usually 4 in. × 6 in., are erected and temporarily secured in place with the aid of stays. The common studs are then set up and spiked to the sill, and a temporary board nailed across their face on the inside. These common studs are the full height from sill to roof plate, and the second tier of floor joists are supported by notching a 1¼ in. × 7 in. board, called a false girt or ribbon, into their inside edge at the height to receive the floor joists. The ends of the joists are also placed against a stud and spiked. The tops of the studs are cut to a line, and a 2 in. × 4 in. plate is spiked on top, an additional 2 in. × 4 in. plate being placed on the top of the last breaking joint. Should the studs not be long enough to reach the plate, then short pieces are fished on with pieces of wood spiked on both sides. The diagram shows a portion of the framework of a two-storey house constructed in the manner described. In the balloon frame the timbers are held together entirely by nails and spikes, thus permitting them to be put up rapidly. The studs are doubled where windows or openings occur. In both these methods dwarf brick foundations should be built, upon which to rest the sill. For buildings of a superior kind a combination of the braced and balloon frames is sometimes adopted.

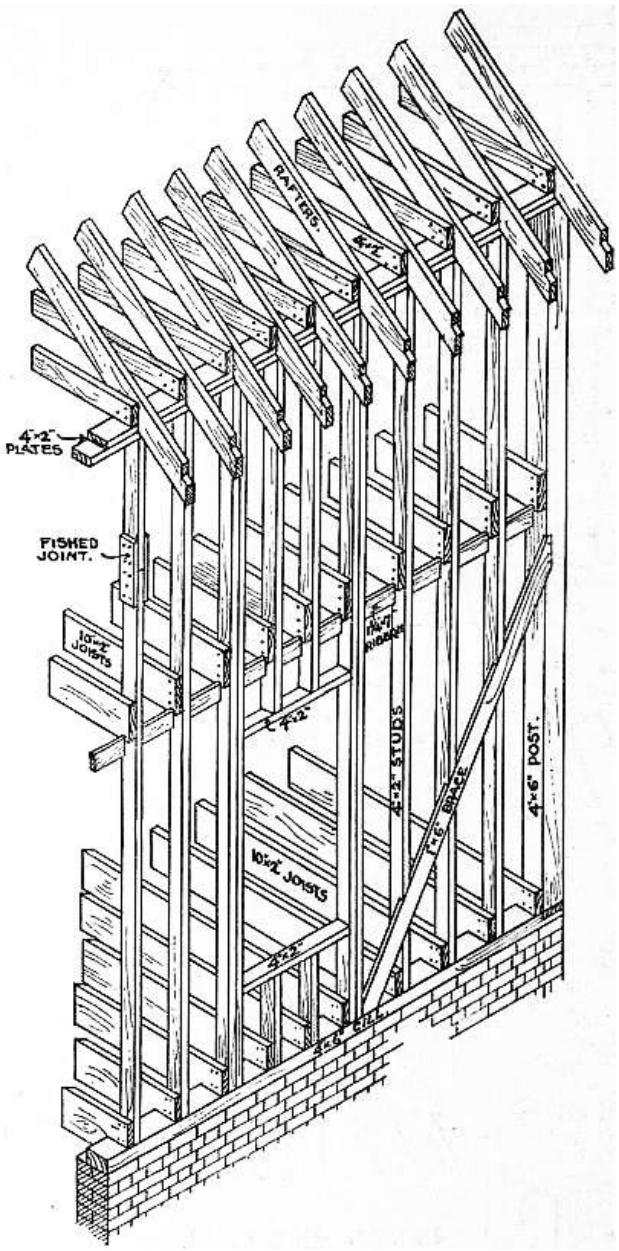


FIG. 36.—Balloon Frame.

The sides of frame buildings are covered with siding, which is fastened to a sheathing of rough boards nailed to the studs. The siding may consist of matched boards placed diagonally, or of clapboards or weather boards—which are thin boards thicker at one edge than the other, and arranged horizontally with the thick edge downwards and overlapping the thin edge of the board below. Shingles or wooden tiles are also employed.

AUTHORITIES.—The following are the principal publications on carpentry: T. Tredgold, *Carpentry*; Peter Nicholson, *Carpenter and Joiner*; J. Newlands, *Carpenter's Assistant*; J. Gwilt, *Encyclopaedia of Architecture*; Rivington, *Building Construction* (elementary and advanced); E.L. Tarbuck, *Encyclopaedia of Practical Carpentry and Joinery*; A.W. Pugin, *Details of Ancient Timber Houses*; Beresford Pite, *Building Construction*; J.P. Allen, *Building Construction*; H. Adams. *Notes on Building*; C.F. Mitchell, *Building Construction* (elementary and advanced); Burrell, *Building Construction*; F.E. Kidder, *Building Construction* (U.S.A.); E.E. Viollet le Duc, *Dictionnaire*; J.K. Krafft, *L'Art de la charpente*.

(J. BT.)

CARPET, the name given to any kind of textile covering for the ground or the floor, the like of which has also been in use on couches and seats and sometimes even for wall or tent hangings or curtains. In modern times, however, carpet usually means a patterned fabric woven with a raised surface of tufts (either cut or looped), and used as a floor covering. Other floor coverings are and have been made also without such a tufted surface, and of these some are simple shuttle-woven materials plain or enriched with needlework or printed

with patterns, others are woven after the manner of tapestry-weaving (see Tapestry) or in imitation of it, and a further class of carpets is made of felt (see Felt). This last material is entirely different from that of shuttle or tapestry weaving. Although carpet weaving by hand is, and for centuries has been, an Oriental industry, it has also been, and is still, pursued in many European countries. Carpet-weaving by steam-driven machinery is solely European in origin, and was not brought to the condition of meeting a widespread demand until the 19th century.

Plate I

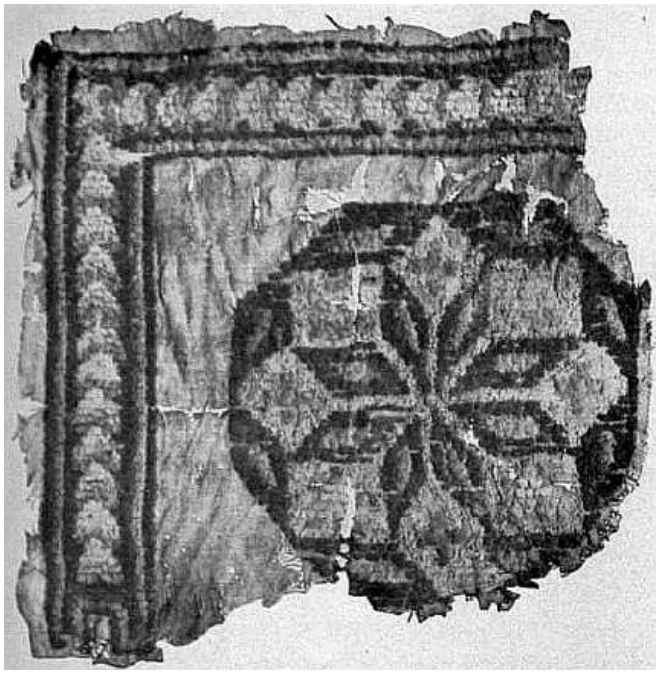


Fig. 1.—PART OF A LINEN COVERING OVER-WROUGHT WITH ORNAMENT IN LOOPS OF COLOURED WOOLS.

Egypto-Roman of the 3rd or 4th century A.D. (Victoria and Albert Museum, South Kensington.)

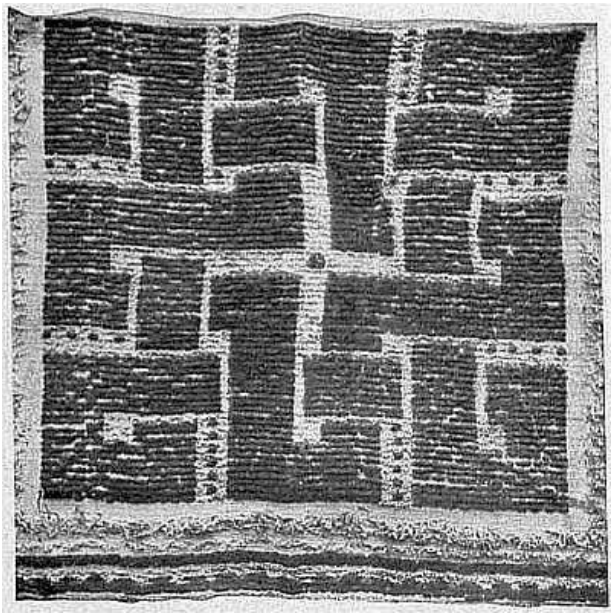


Fig. 2.—PART OF A LINEN COVERING OVER-WROUGHT WITH ORNAMENT IN LOOPS OF DARK-BROWN WOOL.

Egypto-Roman of the 3rd or 4th century A.D. (Victoria and Albert Museum, South Kensington.)

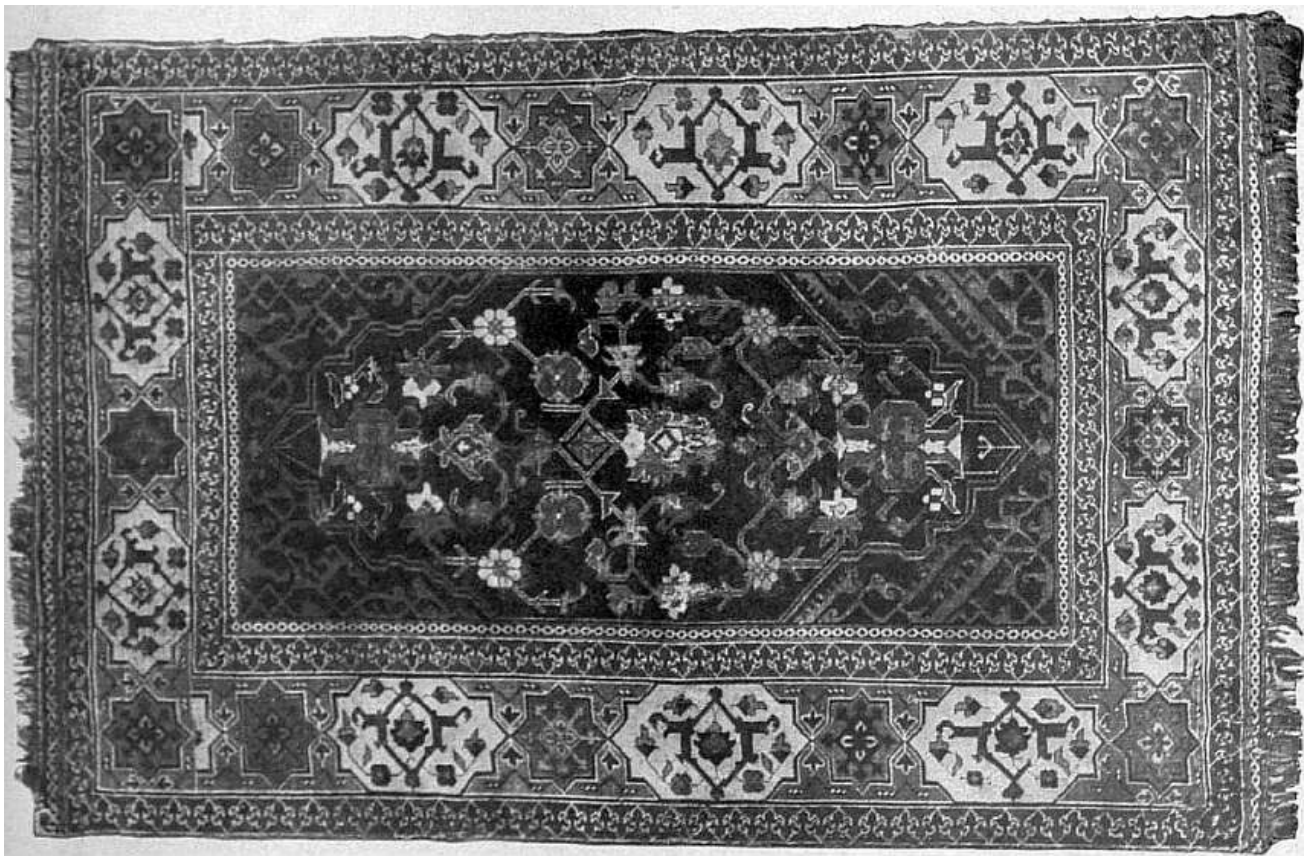


Fig. 3.—CUT PILE TURKEY CARPET, 18th CENTURY, EXEMPLIFYING SUCH CHARACTERISTIC ANGULAR TREATMENT OF QUASI-BOTANICAL FORMS AS IS USUALLY FOUND IN CARPETS AND RUGS MADE IN ASIA

PLATE II

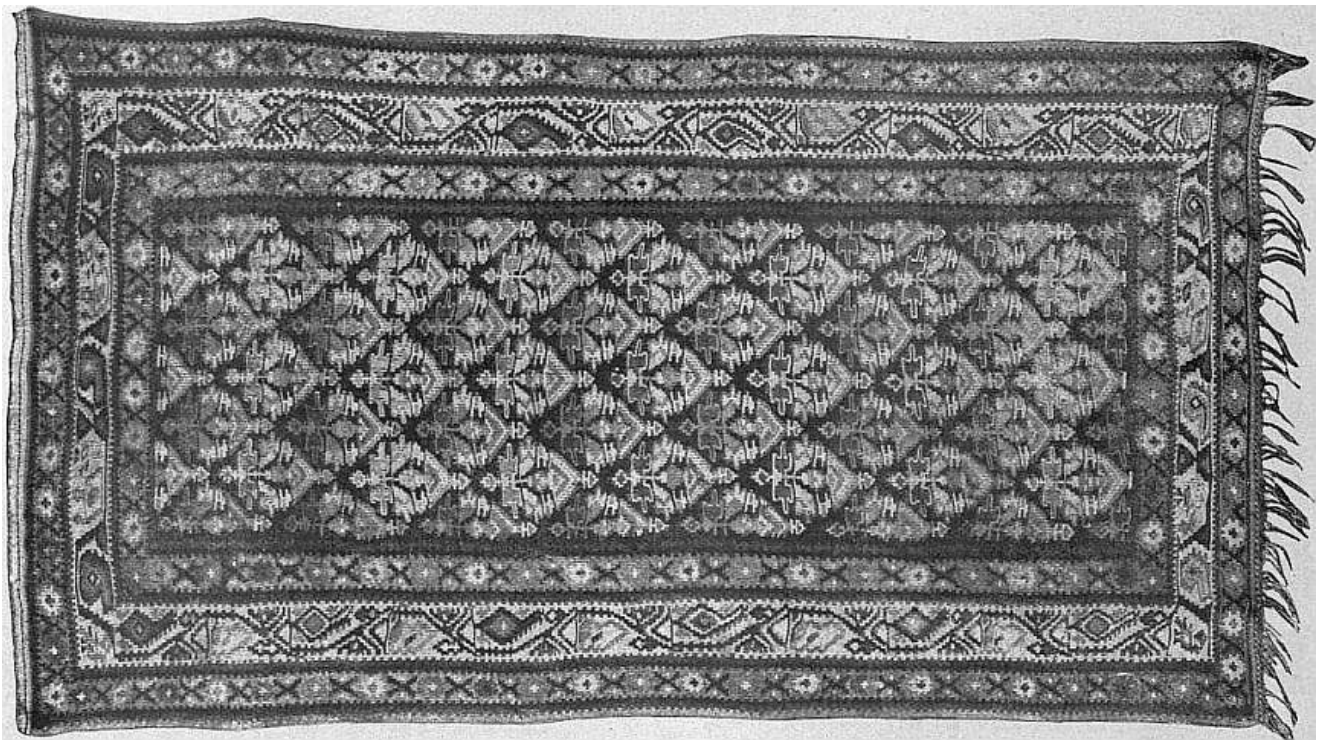


FIG. 4.—RUG MADE IN PERSIA IN THE MANNER OF TAPESTRY WEAVING.

FIG. 5.—CARPET OF STOUT FLAX OR HEMP WOVEN AND THEN COMPLETELY COVERED WITH ORNAMENT WORKED IN CLOSE NEEDLE STITCHES IN COLOURED THREADS.

In connexion with the word “carpet” (Lat. *carpita*, rug; O. Fr. *carpite*) notice may be taken

of the Gr. τάπης and the Lat. *tapetium*, whence also comes the Fr. *tapis* (the present word for "carpet") as well as our own word "tapestry." This latter, though now more particularly descriptive of hangings and curtains woven in a special way, was, in later medieval times, indiscriminately applied to them and to stuffs used as floor and seat coverings. From a very early period classical writers make mention of them. In ancient Egypt, for instance, floor and seat coverings were used in temples for religious ceremonies by the priests of Amen Ra; later on they were used to garnish the palaces of the Pharaohs. If one may judge from rare remains of decorative textiles, in the museum at Cairo especially, dating from at least 1480 B.C., such Egyptian fabrics were of linen inwoven with coloured wools in a tapestry-weaving manner, and were not tufted or piled textures. Taken from the palace at Nineveh is a large marble slab carved in low relief with a geometrical pattern surrounded by a border of lotus flowers and buds, evidently a copy of an Assyrian floor cover or rug about 705 B.C., such as was also woven probably in the tapestry-weaving manner. On the other hand, its design equally well suggests patchwork—a method of needlework in vogue with Egyptians, at least 900 years B.C., for ornamental purposes, as indicated by the elaborately patterned canopy which covered the bier of an Egyptian queen—the mother-in-law of Shishak who took Jerusalem some three or four years after the death of Solomon—and is preserved in the museum at Cairo. In the *Odyssey, tapetia* are frequently mentioned, but these again, whether floor coverings or hangings, are more likely to have been flat-textured and not piled fabrics. On the tomb of Cyrus was spread a "covering of Babylonian tapestry, the carpets underneath of the finest wrought purple" (Arrian vi. 29). Athenaeus (bk. v. ch. 27) gives from Callixenus the Rhodian (c. 280 B.C.) an account of a banquet given by Ptolemy Philadelphus at Alexandria, and describes "the purple carpets of finest wool, with the pattern on both sides," as well as "handsomely embroidered rugs very beautifully elaborated with figures"; these again were probably not piled fabrics but kindred to the hangings in the palace of Ptolemy Philadelphus decorated with portraits, which were likely to have been of tapestry-weaving, and would be nearly the same in appearance on both sides of the fabric. Of corresponding tapestry woven work are Egypto-Roman specimens dating from the 2nd or 3rd century A.D., a considerable collection of which is in the Victoria and Albert Museum at South Kensington. From about the same period date bits of hangings or coverings woven in linen, over-wrought in a method of needlework with ornament of compact loops of worsted (Plate I. figs, 1 and 2). These are the earliest extant specimens of textiles presenting a tufted or piled surface very kindred to that of woven pile carpets of much later date. But the *modus operandi* in producing the earlier only remotely corresponds with that of the later—though making a surface of loops by means of needlework as in the Coptic or Egypto-Roman specimens of Plate I. figs, 1 and 2 seems to be a step in a progress towards the introduction at an apparently later date of tufts into loom weavings such as we find in 16th-century tufted or piled carpets.

History.

The simple traditional Oriental method of making these latter is briefly as follows:—The foundation is a warp of strong cotton or hempen or woollen or silk threads, the number of which is regulated by the breadth of the carpet and the fineness or coarseness to be given to its pile. Short lengths of coloured wool or goats' or camels' hair or silk are knotted on to each of the warp threads so that the two ends of each twist or tuft of coloured yarn, of whatever material it is, project in front. Across the width of the warp and above the range of tufts a weft thread is run in; another line or row of tufts is then knotted, and above this another weft thread is run in across the warps, and so on. These rows of tufts and weft as made are compressed together by means of a blunt fork or rude comb-like instrument, and thus a compact textile with a pile or tufted surface is produced; the projecting tufts are then carefully clipped to an even surface. In the East the rude wooden frames in which the warp-threads are stretched either stand upright upon, or are level with, the ground. They are easily transported and put together, and the weaving in them is done chiefly by wandering groups of weavers. The local surroundings, often those of rocky arid districts, in which Kurdish and other families weave carpets are well illustrated in *Oriental Rugs* by J.H. Mumford. For making pile carpets and rugs two traditional knots are in use; the first is termed the Turkish or Ghiordes knot, from Ghiordes, an old city not far from Brusa. It is in vogue principally throughout Asia Minor, as far east as Kurdistan and the Caucasus, but it is also used farther south-east in parts of Persia and India. The yard of the pile is knotted in short lengths upon the warp-threads so that the two outstanding ends of each knot alternate with every two threads of the warp. The second traditional knot is the Persian or Sehna knot, which, though better calculated to produce a close, fine, even, velvety surface, has in many parts of Persia been abandoned for the Ghiordes knot, which is a trifle more easily tied. The Persian or Sehna knot is tied so that from every space between the warp-threads one end of the knot protrudes. The number of knots to the inch tied according to either the Turkish or

Method of making piled carpets.

Persian method is determined by the size and closeness of the warp-threads and the size and number of weft-threads thrown across after each row of knots. The patterns of the fabrics made by country weavers are usually taken by them from old rugs. But in towns where weaving is conducted under more organized conditions new patterns are often devised, and are traced sometimes upon great cardboards, on which the stitches, or knots, are indicated by squares each painted in its proper colour. In some of the Persian carpets and rugs made at Sehna, Kirman and Tabriz, the warp is of silk, a material that contributes to fine compact pile textures.

Date of original pile textures.

There is much uncertainty as to the period when cut pile carpets were first made in the East. Their texture is certainly akin to that of fustian and velvet; while that of the finer Persian carpets, which were not made much earlier than about the 15th century, is practically not distinguishable from velvet, having long or heavy pile. Fustian, the English name for a cut short pile textile, is derived from Fostat (old Cairo), and such material is likely to have been made there, as soon as anywhere else, by Saracens, especially during the propitious times of the Fatimite Khalifs, who for more than two centuries previously to the 13th century were noted for the encouragement they gave to all sorts of arts and manufactures. It seems that velvet came into use in Europe not much earlier than the 14th century, and various French church inventories of the time contain entries of "*tapis velus* (cut pile carpets) *d'aultre mer, à mettre par terre*" (see *Essai sur l'histoire des tapisseries et tapis*, by W. Chocqueel, Paris, 1863, pp. 22-23). It is an open question if the making of cut pile carpets in Persia or by Saracens elsewhere preceded that of fustians and velvets or whether the developments in making the three proceeded *pari passu.*

Carpets with flat surface.

The making of carpets with a flat surface, however, is probably far older than that of cut pile carpets, and characteristic of one such old method is that in the making of Soumak carpets (Plate II. fig. 5), the ornament of which done in close needle stitches with coloured threads completely conceals the stout flax or hemp web which is the essential material of these carpets. Soumak is a distortion of Shernaka, a Caucasian town in the far east of Asia Minor. But so-called Soumak carpets are made in other districts, and the particular needlework used in them is practically of the same kind as that on a smaller scale used for the well-known Persian Nakshe or woman's trousering, and again that used on a still smaller scale in the ornamentation of valuable Kashmir shawls. Quilted and chain-stitched cotton prayer and bath rugs from Persia are referred to in the article on Embroidery.

Another method of making carpets with a flat surface is that of tapestry-weaving (see Plate II. fig. 4), which, according to existing and well-authenticated specimens of considerable antiquity (already referred to), appears to be the oldest of any historic process of ornamental weaving (see Tapestry).

Motives in traditional designs in Oriental carpets.

Very broadly considered, the traditional designs or patterns of Oriental carpets fall into two classes: the one, prevailing to a much larger extent than the other, seems to reflect the austerity of the Sunni or orthodox Mahommedans in making patterns with abstract geometric and angular forms, stiff interlacing devices, cryptic signs and symbols and the like; whilst the other suggests the freer thought of the Shiah or unorthodox sect, in designs of ingenious blossom and leafy scrolls, conventional arabesques, botanical and animal forms, and cartouches enclosing Kufic inscriptions (see the splendid example known as the Ardebil carpet, Plate III. fig. 7, and another in Plate IV. fig. 9). Types of the more austere design occur in carpets from Afghanistan, Turkestan, Bokhara and Asia Minor, N.W. India and even Morocco, the other types of freer design being almost special to Persian rugs and carpets.

Indian Carpets.

Next in historic importance to Persia, Turkestan and Asia Minor is India, where the making of cut pile carpets—known as Kalin and Kalicha—was presumably introduced by the Mahommedans during the latter part of the 14th century. But the industry did not apparently attain importance until after the founding of the Mogul dynasty by Baber early in the 16th century. The designs mainly derived from those of Persian carpets of that period do not as a rule rise to the excellence of their prototypes. Historical centres of Indian carpet making are in Kashmir, the Punjab and Sind, and at Agra, Mirzapur, Jubbulpore, Warangal in the Deccan, Malabar and Masulipatam. Velvets are richly embroidered in gold and silver thread at Benares and Murshidabad and used as ceremonial carpets, and silk pile carpets are made at Tanjore and Salem. For the most part the best of the Indian woollen pile carpets have been produced by workers of repute engaged by princes, great nobles and wealthy persons to carry on the craft

in their dwellings and palaces. These groups of highly skilled workers as part of the household staff were paid fixed salaries, but they were also allowed to execute private orders. During the 19th century the carpet industry was developed in government gaols. Produced in great quantities the prison-made carpets as a rule are less well turned out, and the competition, set up between them and the rugs and carpets of private factories has had a somewhat detrimental effect upon the industry generally. Older in origin than the cut pile carpets are those of thinner and flat surface texture, which from almost immemorial times have been woven in cotton with blue and white or blue and red stripes in the simplest way. These are called *daris* and *satranjis*, and are made chiefly in Benares and northern India. They are also made in the south and by such aborigines retaining primitive habits as the Todas of the Nilgiri Hills, a fact which points to the age of this particular method of making ground or floor coverings.

Condition controlling designs of Oriental Carpets.

A condition that has always controlled the designs of Oriental carpets is their rectangular shape, more often oblong than square. As a rule, there is a well-schemed border, enclosing the main portion or field over which the details of the pattern are symmetrically distributed. Simpler patterns in the field of a carpet or rug consist of repetitions of the same device or of a small number of different devices (see Plate II. fig. 4). Richer patterns display more organic pattern in the construction, of which the leading and continuous features are expressed as diversified bands, scrolls and curved stems; amongst these latter are very varied devices which play either predominant or subordinate parts in the whole effect of the design (Plate III. fig. 7). Angular and simplified treatments of these elaborate designs are rendered in many Asia Minor or Turkey carpets (Plate I. fig. 3); but the typical flowing and more graceful versions are of Persian origin (see Plate III. fig. 7, and Plate IV. fig. 9), usually of the 16th century. Mingled in such intricate stem designs or “arabesques” are details many of which have been derived on the one hand from Sassanian and even from far earlier Mesopotamian emblematical ornament based on cheetahs seizing gazelles, on floral forms, blossoms and buds so well conventionalized in Assyrian decoration, and on the other hand from Tatar and Chinese sources. The style, strong in suggestion of successive historical periods, seems to have been matured in Mosil engraved and damascened metal work of the 12th and 13th centuries before its occurrence in Persian carpet designs, the finest of which were produced about the reign of Shah Abbas. A good deal earlier than this period are carpets designed chiefly according to the simpler taste of the Sunnites, and such as these appear to be mentioned by Marco Polo (1256-1323) when writing that “in Turcomania they weave the handsomest carpets in the world.” He quotes Conia (Konieh in Anatolia), Savast (Sivas in Asia Minor), some 300 m. north-east of Konieh, and Cassaria (Kaisaria or Caesaraea in Anatolia) as the chief weaving centres. It is the carpets from such places rather than from Persia that appear to have been the first Oriental ones known in European countries.

Carpets in Europe.

Entries of Oriental carpets are frequent in the inventories of European cathedral treasures. In England, for instance, carpets are said to have been first employed by Queen Eleanor of Castile and her suite during the latter part of the 13th century, who had them from Spain, where their manufacture was apparently carried on by Saracens or Moors in the southern part of the country. On the other hand, Pierre Dupont, a master carpet-maker of the Savonnerie (see below), gives his opinion in 1632 that the introduction of carpet-making into France was due to the Saracens after their defeat by Charles Martel in A.D. 726. But more historically precise is the record in the book of crafts (*Livre des métiers*) by Etienne Boileau, provost of the merchants in Paris (1258-1268), of “the tapicers or makers of *tapis sarrasinois,*[1] who say that their craft is for the service only of churches or great men like kings and nobles.” In the 13th and 14th centuries Saracen weavers of rich and ornamental stuffs were also employed at Venice, which was a chief centre for importing Oriental goods, including carpets, and distributing them through western Europe. Dr Bode, in his *Vorderasiatische Knüpfteppiche,* instances Oriental carpets with patterns mainly of geometric and angular forms represented in frescoes and other paintings by Domenico di Bartolo (1440), Niccolo di Buonaccorso (1450), Lippo Memmi (1480) and others.

Of greater interest perhaps, and especially as throwing light upon the trade, in, if not the making of, carpets in England somewhat in the method of contemporary Turkey carpets, is the specimen represented in Plate III. fig. 6. This may have been made in England, where foreign workmen, especially Flemings, were from early times often encouraged to settle in order to develop industries, amongst which pile carpet-making probably and tapestry-weaving certainly were included. The earliest record of tapestry-weaving works in England is that of William Sheldon’s at Barcheston, Warwickshire, in 1509, and, besides wall hangings,

carpets of tapestry-weaving were also possibly made there.[2] The cut pile carpet belonging to Lord Verulam (Plate III. fig. 6) was perhaps made at Norwich. It has a repeating and simply contrived continuous pattern of carnations and intertwining stems with a large lozenge in the centre bearing the royal arms of England with the letters E.R. (Elizabeth Regina) and the date 1570. It also has the arms of the borough of Ipswich and those of the family of Harbottle. The sequence or continuity of its border pattern fails in the corners at one end of the rug or carpet in a way very common to many Asia Minor and Spanish carpets (see Plate I. fig. 3, Plate II. fig. 4, and Plate IV. fig. 10); not, however, to the majority of Persian carpets (see Plate III. fig. 7, and Plate IV. fig. 8). A large cut pile carpet in the Victoria and Albert Museum has a repeating pattern of star devices, rather Moorish in style, with the inscription on one end of the border, "Feare God and Keep His Commandments, made in the yeare 1603," and in the field the shield of arms of Sir Edward Apsley of Thakeham, Sussex, impaling those of his wife, Elizabeth Elmes of Lifford, Northamptonshire. This may have been made in England. A carpet of very similar design, especially in its border, is to be seen in a painting by Marc Gheeraedts of the conference at old Somerset House of English and Spanish plenipotentiaries (1604), now in the National Portrait Gallery, London. A more important and finer carpet belongs to the Girdlers' Company (Plate IV. fig. 8), and is of Persian design, into which are introduced the arms of the company, shields with eagles, and white panels with English letters, the monogram of Robert Bell the master in 1634, but this was made at Lahore[3] to his order.

Before dealing with later phases of the carpet industry in England, mention may now be made of Spanish carpets, of European as distinct from Saracenic or Persian design; the making of them dates at least from the end of the 15th century or the beginning of the 16th century. It is only within recent years that specimens of them have been obtained for public collections, and at present little is known of the factories in Spain whence they came. A large and most interesting series is shown in the Victoria and Albert Museum, and a portion of one of the earlier of the Spanish cut pile carpets in that museum is given in Plate IV. fig. 10. The inner repeating pattern has suggestions of a lingering Moorish influence, but a superior version of it with better definition is to be seen in extant bits of Spanish shuttle-woven silks of the 16th century. The border of distorted dragon-like creatures is of a Renaissance style, and this style is more pronounced in other Spanish carpets having borders of poorly treated Italian 16th-century pilaster ornament. Beside cut pile, many Spanish carpets of the 17th and 18th centuries have looped and flat surfaces, and bear Spanish names and inscriptions; many too are of needlework in tent or cross stitch.

Spanish carpets.

Another interesting class of very fine pile carpets that has also become known comparatively recently to collectors is the so-called Polish carpets, generally made of silk pile for the ornament, which is distinctively Oriental, and of gold and silver thread textile for the ground, very much after the manner of early 17th-century Brusa fabrics. Many of these carpets are in the Czartoryski collection at Cracow. They are discussed by Dr Bode in his treatise on Oriental carpets already referred to. European coats of arms of the persons for whom they were made are often introduced into them, sometimes different in workmanship from that of the carpets, though there are specimens in which the workmanship is the same throughout. The details of their designs consist for the most part of arabesques and long curved serrated leaves similar to such as are commonly used in Rhodian pottery decoration of the 16th century, though more typical of those so frequent in 17th-century Turkish ornament. Various considerations lead to the conclusion that these so-called Polish carpets were probably made in either Constantinople or Damascus (*tapete Damaschini* frequently occur in Venetian inventories of the 16th century) rather than, as has been thought, by the Persian workmen employed at the Mazarski silk factory which lasted for a short period only during the 18th century at Sleucz in Poland.

Polish carpets

The European carpet manufactory, of which a continuous history for some two hundred and fifty years is recorded with exceptional completeness, is that which has been maintained under successive regimes, royal, imperial and republican, in France—at the Hotel des Gobelins in Paris. Seventy years before its organization under Colbert in 1667 as a state manufactory (*Manufacture Royale des Meubles de la Couronne*), Henry IV. had founded royal art workshops for all sorts of decorative work, at the Louvre; and here in 1604 a workroom was established for making Oriental carpets by the side of that which existed for making *tapis flamands*. In 1610 letters patent were granted to the Sieur Fortier, who has been reputed to be the first inventor in France of the art of making in silk and wool real Turkey and other piled carpets with grounds of gold thread, which must have been sumptuous fabrics probably resembling the so-called

Carpets made in France.

Polish carpets of this date. Some ten years later it is recorded that Pierre Dupont and Simon Lourdet started a pile carpet (*tapis veloutés*) manufactory at Chaillot (Paris) in large premises which had been used for the manufacture of soap—whence the name of "Savonnerie." To this converted manufactory were transferred in 1631 the carpet-makers from the Louvre, and under the direct patronage of the crown it continued its operations for many years at Chaillot. It was not until 1828 that the making of *tapis de la Savonnerie* (pile carpets of a fine velvety character) was transferred to the Hôtel des Gobelins. Here, in contradistinction to the Savonnerie, carpets are made others which, like those of Beauvais (where a manufactory of hangings and carpets was established by Colbert in 1664), are *tapis ras* or non-piled carpets, being of tapestry-weaving, as also are those made by old-established firms at Aubusson and at Felletin, where the manufacture was flourishing, at the former place in 1732 and at the latter in 1737.

Returning now to England, there are evidences towards the end of the 17th century, if not earlier, that Walloon and Flemish makers of Turkey pile carpets had settled and set up works in different parts of the country. A protective charter, for instance, was granted in 1701 by William III. to weavers in Axminster and Wilton. The ultimate celebrity of the pile carpet industry at Wilton was due mainly to the interest taken in it during the earlier part of the 18th century by Henry, earl of Pembroke and Montgomery, who in the course of his travels abroad collected certain French and Walloon carpet-makers to work for him in Wiltshire—over them he put two Frenchmen, Antoine Dufossy and Pierre Jemale. More notable, however, than these is Pere Norbert, who naturalized himself as an Englishman, changed his name to Parisot, and started a manufactory of pile carpets and a training school in the craft at Fulham about 1751. In 1753 he wrote and published "An account of the new manufactory of Tapestry after the manner of that at the Gobelins, and of carpets after the manner of that at Chaillot (*i.e.* Savonnerie) now undertaken at Fulham by Mr Peter Parisot." Two refugee French carpet-makers from the Savonnerie had arrived in London in 1750, and started weaving a specimen carpet in Westminster. Parisot, having found them out, induced the duke of Cumberland to furnish funds for their removal to better workrooms at Paddington. The carpet when finished was presented by the duke to the princess dowager of Wales. Parisot quarrelled with his two employees, enticed others to come over, and then removed the carpet works from Paddington to Fulham. A worker, J. Baptiste Grignon, writing to "Mr Parisot in Foulleme Manufactory," mentions the marked preference "shown by the English court for velvet," and how much a "chair-back he had worked in the manner of the Savonnerie had been admired." Correspondence published in the *Nouvelles Archives de l'art français* (1878) largely relates to the efforts of the French government to stop the emigration to England of workers from the Gobelins and the Savonnerie. Parisot's Fulham works were sold up in 1755. He then tried to start a manufactory at Exeter, but apparently without success, as in 1756 his Exeter stock was sold in the Great Piazza auction rooms, Covent Garden. Joseph Baretti (Dr Johnson's friend), writing from Plymouth on the 18th of April 1760, alludes to his having that morning visited the Exeter manufactory of *tapisseries de Gobelins* "founded by a distinguished anti-Jesuit—the renowned Father Nobert." Previously to this a Mr Passavant of Exeter[4] had received in 1758 a premium from the Society of Arts of London for making a carpet in "imitation of those brought from the East and called Turky carpets." Similar premiums had been awarded by the society in 1757 to a Mr Moore of Chiswell Street, Moorfields, and to a Mr Whitty of Axminster. In 1759 a society's premium was won by Mr Jeffer of Frome. In the *Transactions of the Society,* vol. i., dated 1783, it is stated that by their rewards, the manufacture of "Turky carpets is now established in different parts of the kingdom, and brought to a degree of elegance and beauty which the Turky carpets never attained." Such records as these convey a fair notion of the sporadic attempts which immediately preceded a systematic manufacture of pile carpets in this country. Whilst the Wilton industry survived, that actually carried on at Axminster died towards the end of the 18th century, and the name of Axminster like that of Savonnerie carpets now perpetuates the memory of a locally deceased manufactory, much as in a parallel way Brussels carpets seem to owe their name to the renown of Brussels as an important centre in the 15th and 16th centuries for tapestry-weaving.

Modern machinery.

Before the existence of steam-driven carpet-making machinery in England, employers, following the example set by the French, applied the Jacquard apparatus, for regulating and facilitating the weaving of patterns, to the hand manufacture of carpets. This was early in the 19th century; a great acceleration in producing English carpets occurred, severely threatening the industry as pursued (largely for *tapis ras*) at Tournai in Belgium, at Nimes, Abbeville, Aubusson, Beauvais, Tourcoing and Lannoy in France. The severity of the competition, however, was still more increased when English enterprise, developing the inventions of Erastus B. Bigelow (1814-1879) of America and Mr William Wood of England, took the lead in perfecting Jacquard

weaving carpet looms worked by steam, which resulted in the setting up of many power-loom carpet manufactories in the United Kingdom. It was not until 1880 that French pile carpet manufacturers began to adopt similar carpet power-looms, importing them from England.

These machines for weaving pile carpets, either looped (*bouclé*) as in Brussels, or cut (*velouté*) as in Wilton or Axminster carpets, were similar in all respects to such as had been in use by the important English manufacturers—Crossley of Halifax, Templeton of Glasgow, Humphreys of Kidderminster, Southwell of Bridgnorth, and others. A so-called tapestry carpet weaving-loom was invented by Richard Whytock of Edinburgh in 1832, but it was not brought to sufficient completeness for sustained manufacture until 1855. The essential feature of Mr Whytock's process was that the warp-threads were dyed and parti-coloured, in such a way that when woven the several points of colour formed the pattern of the whole fabric. Although the name "tapestry" is used, the texture of these wares has but a remote likeness to that of hand-made tapestry hangings and carpets such as those of the Gobelins and Aubusson manufactories, nor is it the same as the texture of Brussels carpets. Machine-made tapestry carpets are also called "ingrain" carpets, because the wool or worsted is dyed in the grain, *i.e.* before manufacture. Germany in her manufacture of carpets resorts chiefly to the "ingrain" process, but in common with Holland and Belgium she produces pile (looped and cut) carpets from power-looms. In the United States of America there are many similar and very important carpet manufactories; and Austria produces fine cut pile carpets (*veloutés*), the designs of which are largely derived from those of the Aubusson tapestry-woven carpets (*tapis ras*).

Lengths or pieces of felt and other substantial material are frequently made for floor and stair carpeting, and are often printed with patterns. These of course come into quite another class technically. The technological aspects of the several branches of carpet manufacture by machinery are treated in the articles on Textile-printing and Weaving. Briefly, the products of carpet manufacture practically fall into three main divisions: (1) Pile carpets (*tapis moquettes*) which are either looped (*bouclé*) or cut (*velouté*); (2) flat surface carpets (*tapis ras*) as in hand tapestry-woven material; and (3) printed stuffs used for carpeting.

Modern hand-made carpets.

Whilst the production of carpets by steam power predominates in Europe and the United States of America, and at one time appeared to be giving the *coup de grâce* to the craft of making carpets by hand, there has been in recent times a revival in this latter, and many carpets of characteristic modern design, several of them made in England, are due to the influence of the late William Morris, who devoted much of his varied energies to tapestry weaving and pile carpet weaving by hand, both of which crafts are being fostered as cottage industries in parts of Ireland, as well as in England. At the same time leading English carpet manufactures continue to produce hand-made carpets as occasion requires. In France a much more systematic existence of tapestry weaving and pile carpet making by hand has been maintained and is of course attributable to the perennial activity of the state tapestry works in Paris (at the Gobelins workshops) and in Beauvais, and of corresponding works managed by private enterprise at Aubusson and elsewhere.

Designing patterns for English carpet manufacture is now more organized than it was, and greater thought and invention are given to devising ornament suitable to the purpose of floor coverings. Before 1850 and for a few years later, rather rude realistic representations of animals and botanical forms (decadent versions of Savonnerie designs) were often wrought in rugs and carpets, and survivals of these are still to be met with, but the lessons that have been subsequently derived from intelligent study of Oriental designs have resulted in the definite designing of conventional forms for surface patterns. The early movement in this direction owes much to the teaching of Owen Jones, and in its later and rather freer phases the Morris influence has been powerful. Schools of art at Glasgow, at Manchester, Birmingham and elsewhere in the United Kingdom have trained and continue to train designers, whose work has contributed to the formation of an English style with a new note, which, as a French writer puts it, has created a sensation in France, in Germany, in fact in all Europe and America.

France retains that facility of execution and liveliness in invention which have been nurtured for over three hundred years by systematic, governmental solicitude for education in decorative design and enterprise in perfecting manufacture. Her Aubusson and Savonnerie carpets have maintained a style of design in form and colour entirely different from any that clearly throws back to Oriental principles, and many of the designs for the finer and larger of these carpets are schemed with large central oval panels, garlands of flowers and fantastic frames very much on the plan of what is frequently to be seen in the decoration of ceilings. At the same time the style called *l'art nouveau* has become developed. It largely grows from

very fanciful dispositions of free-growing natural forms, as well as curiously curved and tenuous forms, many of which are bone-like and fibre-like in character, flat in treatment and rather thin and washy in colour, and its influence has slightly percolated into designs for pile carpets. This style, sometimes intermixed with the more robust, less fantastic and rather fuller-coloured English style, has found followers in England, America and Germany, but the bulk of the designs now used in power carpet looms seems to be mainly of Oriental descent.

The more important art museums in Europe contain collections of Oriental carpets, and the history of many is fairly well established. The subject has become one of serious study, the results of which have been published and elucidated by means of well-executed coloured reproductions of carpets and rugs preserved in both public and private collections.

PLATE III.

FIG. 6.—CUT PILE WORSTED CARPET, BEARING ROYAL ARMS OF ENGLAND WITH E.R. (ELIZABETH REGINA); DATE 1570.

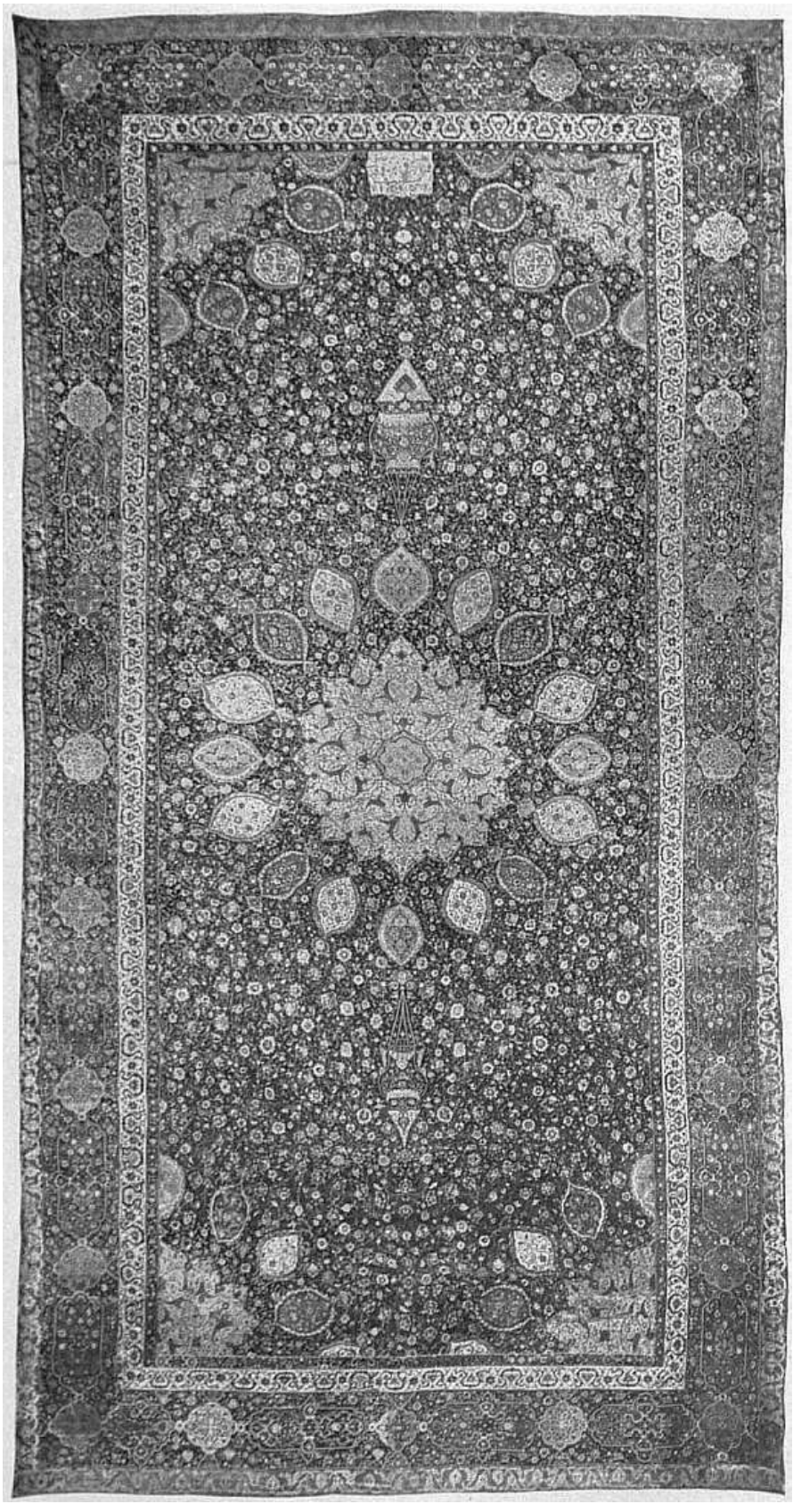


FIG. 7.—VERY FINE CUT PILE PERSIAN CARPET KNOWN AS THE HOLY CARPET OF THE MOSQUE AT ARDEBIL.

PLATE IV.

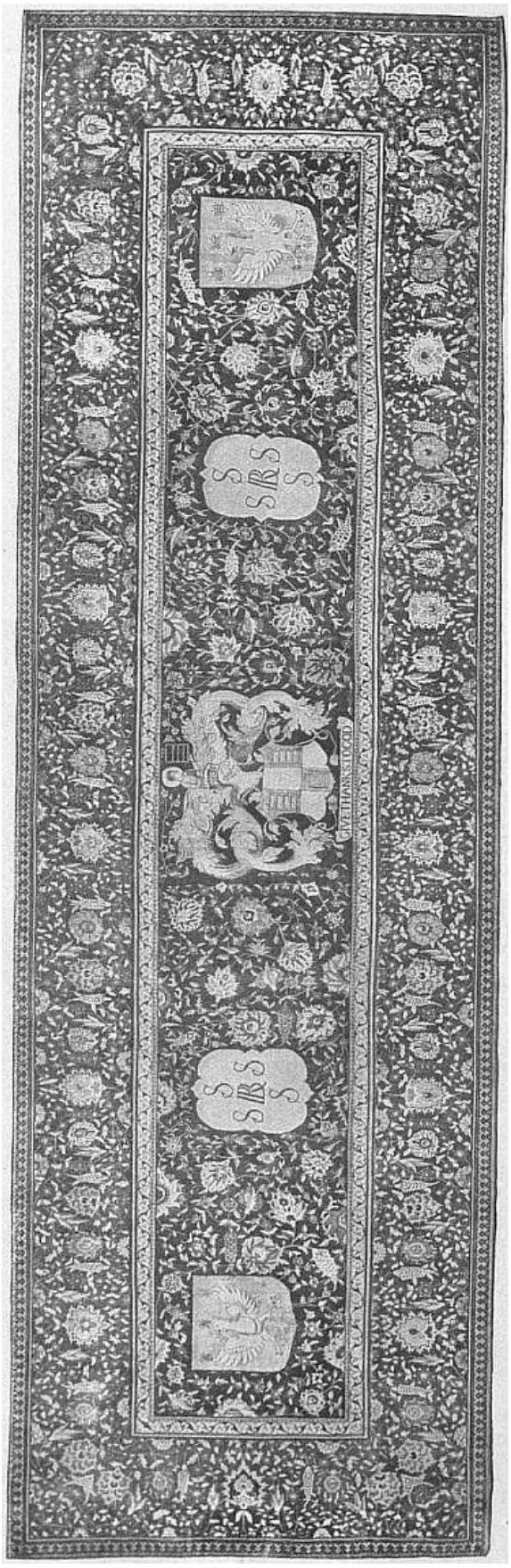


FIG. 8.—FINE CUT PILE LAHORE CARPET (c. 1664) BELONGING TO GIRDLERS' COMPANY IN LONDON. OF PERSIAN DESIGN.

FIG. 9.—CORNER OF A CUT PILE CARPET OF PERSIAN MANUFACTURE, 16TH CENTURY.

FIG. 10.—CUT PILE CARPET OF SPANISH MANUFACTURE, EARLY 16TH CENTURY.

BIBLIOGRAPHY.—(1) *An Account of the New Manufactory of Tapestry after the manner of that at the Gobelins; and of Carpets after the manner of that at Chaillot, &c., now undertaken at Fulham, by Mr Peter Parisot* (London, Dodsley, 1753, 8vo). This is probably the only account of carpet-making in England during the 18th century; it is of peculiar interest in that respect, and as containing a statement that "the Manufacture of Chaillot is altogether of wool, and

worked in the manner of Velvet. All sorts of Figures of Men and Animals may be imitated in this work; but Fruits and Flowers answer better; and the properest employment for this Art is to make Carpets and all sorts of Skreens." (2) *Essai sur l'histoire et la situation actuelle de l'industrie des tapisseries et tapis*, by W. Chocqueel (Paris, 1863). (3) Vol. xi. of *Reports on the Paris Universal Exhibition of 1867*, containing "Report on Carpets, Tapestry and other stuffs for Furniture," by Matthew Digby Wyatt, F.S.A. (1868). In reviewing the modern products shown at the exhibition, Sir Digby Wyatt discusses at some length the aesthetics of carpet design. (4) *British Manufacturing Industries*, edited by G. Phillips Bevan, "Carpets," by Christopher Fresser (London, 1876). (5) *Altorientalische Teppichmuster nach Bildern und Originalen des xv.-xvi. Jahrhunderts*, by Julius Lessing (Berlin, 1877). Numerous references are made in this illustrated work to the carpet designs that occur in paintings by Italian and Flemish masters. (6) *Eastern Carpets*, by Vincent J. Robinson, with water-colour drawings by E. Julia Robinson (London, 1882, large 4to). In this publication, which precedes by nine or ten years the more learned works by Riegl and Bode, there are two examples, one ascribed to the manufactory at Alcaraz in La Mancha, and one to the supposed manufactory of the 17th century at Warsaw. By the light of later and more complete investigations Mr Robinson's ascriptions are scarcely borne out. (7) *Oriental Carpets*, by Herbert Coxon (London, 1884, 8vo). (8) *Altorientalische Teppiche*, by Alois Riegl (Leipzig, 1891); a useful book of reference (containing thirty-six illustrations) of manufacturing, archaeological and artistic interest. (9) *Jahrbuch der kunsthistorischen Sammlungen des Allerhöchsten Kaiserhauses*, vol. xiii. (Wien, 1892). Containing an important and finely illustrated article, "Ältere orientalische Teppiche aus dem Besitze des Allerhöchsten Kaiserhauses," by Alois Riegl, in the course of which comparisons are made between the designs in Persian MS. illustrations, in engraved metal work and those of carpets. (10) *Oriental Carpets*, published by the Austrian Commercial Museum (English edition by C. Purdon Clarke) (Vienna, 1892-1896). This contains a series of monographs by I.M. Stockel, Smyrna; Dr William Bode, Berlin; Vincent Robinson, London; M. Gerspach, Paris; T.A. Churchill, Tehran; Sir George Birdwood, London; C. Purdon Clarke, London; and Alois Riegl, Vienna, and a preface by A. von Scala, Vienna, (n) *Ancient Oriental Carpets*, a supplement to the above, four parts containing twenty-five plates with text (Leipzig, 1906, large folio). (12) *Vorderasiatische Knüpfteppiche aus älterer Zeit*, by Wilhelm Bode (Leipzig, 1901). This learned treatise gives *inter alia* suggestive notes upon the production of the so-called Polish carpets and of Spanish carpets. (13) *Ein orientalischer Teppich vom Jahre 1202 und die ältesten orientalischen Teppiche*, by Alois Riegl (Berlin, 1895). A coloured illustration is given of a pile curtain with a triple niche design and an Armenian inscription that it was made by "Gorzi the Artist" to the glory of the church of St Hripsime—an Armenian martyr. The date 651 appears in the inscription, but Riegl adduces valid reasons for reading it as the equivalent of A.D. 1202. Another pile carpet of conventional garden design, probably not of earlier manufacture than 14th century, is also illustrated and carefully discussed, especially in connexion with the appearance in it of well-authenticated Sassanid devices—streams with fishes and birds, &c. (14) *Report on Carpets at the Paris Exhibition of 1900*, by Ferdinand Leborgne (1901, 8vo). (15) *Oriental Rugs*, by John Kimberly Mumford (London, 1901), contains twenty-four colour-plate and autotype reproductions of rugs and eight photo-engravings of phases of the rug industry—amongst which latter are: "A Nomad Studio," "Kurdish Girls at the Loom," "Boy Weavers of Tabriz," and a "Rug Market in Iran." (16) *Rugs, Oriental and Occidental*, by Rosa Belle Holt (Chicago, 1901), well illustrated, with colour-plate reproductions of various types of rugs, including less known Chinese and Navajo specimens. (17) *The Art Workers' Quarterly*, vol. iii. No. II, July 1904; article on the pile carpet belonging to the Worshipful Company of Girdlers of the City of London, by A.F. Kendrick, with a colour-plate of this remarkable carpet, made to the order of the master of the company in 1634 at Lahore. (18) *Journal of Indian Art and Industry: Indian Carpets and Rugs* (parts 87 to 94) (London, 1905 and 1906). Upwards of ninety-nine illustrations of many varieties of Indian and Persian carpets are given in this publication, a large number showing debased versions of fine designs, *e.g.* some from the Punjab, Warangal, Mirzapur and Elura; those from Yarkand exhibit Tatar and Chinese influences. (19) *A History of Oriental Carpets before 1800*, by F.R. Martin, published by the State Printing Office in Vienna (Bernard Quaritch, London, 1906). This contains a series of excellent reproductions in colours of Oriental carpets, many of which, being presents to kings of Sweden by the shah of Persia in the 17th century, are to be seen in the castles of Stockholm and Copenhagen—others are in the Imperial Museum at Constantinople or belong to private owners.

(A. S. C.)

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1 The *tapissiers sarrasinois* were apparently the makers of piled or velvety carpets, and have always been written about in contradistinction to the *tapissiers de haute lisse* or *tapissiers nostrez,* who it appears did not weave piled or velvety material, but made tapestry-woven hangings and coverings for furniture.

2 In Hakluyt's *Voyages* mention is made of directions having been given to Morgan Hubblethorne, a dyer, to proceed (about 1579) to Persia to learn the arts of dyeing and of making carpets.

3 The Royal Factory at Lahore was established by Akbar the Great in the 16th century.

4 A wealthy serge-maker of Swiss nationality, who had been settled for some years in Exeter, and bought up the plant of Parisot's Exeter works. (See *Bulletin de la société de l'histoire de l'art français,* p. 97, vol. 1875 to 1878.)

CARPET-BAGGER, a political slang term for a person who stands as a candidate for election in a locality in which he is a stranger. It is particularly used of such a candidate sent down by the central party organization. The term was first used in the western states of America of speculative bankers who were said to have started business with no other property than what they could carry in a carpet-bag, and absconded when they failed. The term became of general use in American politics in the reconstruction period after the Civil War, as a term of contempt for the northern political adventurers in the South who, by the help of the negro vote, gained control of the administration.

CARPET-KNIGHT, properly one who has been knighted in time of peace on the carpet before the king's throne, and not on the field of battle as an immediate reward for valour. It is used as a term of reproach for a soldier who stays at home, and avoids active service and its hardships, with a particular reference to the carpet of a lady's chamber, in which such a *sainéant* soldier lingers.

CARPI, GIROLAMO DA (1501-1556), Italian historical and portrait painter, born at Ferrara, was one of Benvenuto Garofalo's best pupils. Becoming infatuated with the work of Correggio, he quitted Ferrara, and spent several years in copying that master's paintings at Parma, Modena and elsewhere, succeeding in aping his mannerisms so well as to be able to dispose of his own works as originals by Correggio. It is probable that not a few pictures yet attributed to the great painter are in reality the work of his parasite. Da Carpi's best paintings are a Descent of the Holy Spirit, in the church of St Francis at Rovigo; a Madonna, an Adoration of the Magi, and a St Catharine, at Bologna; and the St George and the St Jerome, at Ferrara.

CARPI, UGO DA, Italian 15th-century painter, was long held the inventor of the art of printing in chiaroscuro, afterwards brought to such perfection by Parmigiano and by Baltasar Peruzzi of Siena. The researches of Michael Huber (1727-1804) and Johann Gottlob Immanuel Breitkopf (1719-1794) have proved, however, that this art was known and practised in Germany by Johann Ulrich Pilgrim (Wächtlin) and Nikolaus Alexander Mair (1450-c. 1520), at least as early as 1499, while the date of the oldest of Da Carpi's prints is 1518. Printing in chiaroscuro is performed by using several blocks. Da Carpi usually employed three—one for the outline and darker shadows, another for the lighter shadows, and a third for the half-tint. By means of them he printed engravings after several pictures and after some of the cartoons of Raphael. Of these a Sybil, a Descent from the Cross, and a History of Simon the Sorcerer are the most remarkable.

CARPI, a Dacian tribe established upon the lower Danube from the 1st century B.C. They rose to considerable power during the 3rd century A.D., and claiming to be superior to the Goths accordingly demanded that their incursions into Roman territory likewise should be bought off by tribute. When this was refused they invaded in force, but were beaten back by the emperor Philip. After this they joined with the Goths in their successful inroads until both nations were defeated by Claudius Gothicus. Later, after repeated defeats under Diocletian and Galerius, they were taken under Roman protection and the greater part established in the provinces of Pannonia and Moesia; some were left beyond the Danube, and they are last heard of as allies of the Huns and Sciri in the time of Theodosius I. Ptolemy speaks of Harpii and a town Harpis. This was no doubt the form the name assumed in the mouths of their Germanic neighbours, Bastarnae and Goths.

(E. H. M.)

CARPI, a town and episcopal see of Emilia, Italy, in the province of Modena, 9 m. N.N.W. by rail from the town of Modena. Pop. (1905) 7118 (town), 27,135 (commune). It is the junction of a branch line to Reggio nell' Emilia via Correggio, and the centre of a fertile agricultural district. Carpi contains several Renaissance buildings of interest, the façade of the old cathedral (an early Romanesque building in origin, with some early 15th-century frescoes), the new cathedral (after 1513), perhaps the nave of S. Niccolò and a palace, all being by Baldassare Peruzzi: while the prince's palace (with a good court and a chapel containing frescoes by Bernardino Loschi of Parma, 1489-1540) and the colonnades opposite the theatre are also good. These, and the fortifications, are all due to Alberto Pio of Carpi, a pupil of Aldus Manutius, expelled in 1525 by Charles V., the principality being given to the house of Este.

CARPINI, JOANNES DE PLANO, the first noteworthy European explorer of the Mongol empire (in the 13th century), and the author of the earliest important Western work on northern and central Asia, Russian Europe, and other regions of the Tatar dominion. He appears to have been a native of Umbria, where a place formerly called Pian del Carpine, but now Piano della Magione, stands near Perugia, on the road to Cortona. He was one of the companions and disciples of his countryman St Francis of Assisi, and from sundry indications can hardly have been younger than the latter, born in 1182. Joannes bore a high repute in the order, and took a foremost part in the propagation of its teaching in northern Europe, 398
holding successively the offices of warden (*custos*) in Saxony, and of provincial (*minister*) of Germany, and afterwards of Spain, perhaps of Barbary, and of Cologne. He was in the last post at the time of the great Mongol invasion of eastern Europe and of the disastrous battle of Liegnitz (April 9, 1241), which threatened to cast European Christendom beneath the feet of barbarous hordes. The dread of the Tatars was, however, still on men's mind four years later, when Pope Innocent IV. despatched the first formal Catholic mission to the Mongols (1245), partly to protest against the latter's invasion of Christian lands, partly to gain trustworthy information regarding the hordes and their purposes; behind there may have lurked the beginnings of a policy much developed in after-time—that of opening diplomatic intercourse with a power whose alliance might be invaluable against Islam.

At the head of this mission the pope placed Friar Joannes, at this time certainly not far from sixty-five years of age; and to his discretion nearly everything in the accomplishment of the mission seems to have been left. The legate started from Lyons, where the pope then resided, on Easter day (April 16, 1245), accompanied by another friar, one Stephen of Bohemia, who broke down at Kanev near Kiev, and was left behind. After seeking counsel of an old friend, Wenceslaus, king of Bohemia, Carpini was joined at Breslau by another Minorite, Benedict the Pole, appointed to act as interpreter. The onward journey lay by Kiev; the Tatar posts were entered at Kanev; and thence the route ran across the Dnieper (*Neper, Nepere*, in Carpini and Benedict) to the Don and Volga (*Ethil* in Benedict; Carpini is the first Western to give us the modern name). Upon the last-named stood the *Ordu* or camp of Batu, the famous conqueror of eastern Europe, and the supreme Mongol commander on the

western frontiers of the empire, as well as one of the most senior princes of the house of Jenghiz. Here the envoys, with their presents, had to pass between two fires, before being presented to the prince (beginning of April 1246). Batu ordered them to proceed onward to the court of the supreme khan in Mongolia; and on Easter day once more (April 8, 1246) they started on the second and most formidable part of their journey—"so ill," writes the legate, "that we could scarcely sit a horse; and throughout all that Lent our food had been nought but millet with salt and water, and with only snow melted in a kettle for drink." Their bodies were tightly bandaged to enable them to endure the excessive fatigue of this enormous ride, which led them across the *Jaec* or Ural river, and north of the Caspian and the Aral to the Jaxartes or Syr Daria (*quidam fluvius magnus cujus nomen ignoramus*), and the Mahommedan cities which then stood on its banks; then along the shores of the Dzungarian lakes; and so forward, till, on the feast of St Mary Magdalene (July 22), they reached at last the imperial camp called *Sira Orda* (*i.e.* Yellow Pavilion), near Karakorum and the Orkhon river—this stout-hearted old man having thus ridden something like 3000 m. in 106 days.

Since the death of Okkodai the imperial authority had been in *interregnum*. Kuyuk, Okkodai's eldest son, had now been designated to the throne; his formal election in a great *Kurultai*, or diet of the tribes, took place while the friars were at Sira Orda, along with 3000 to 4000 envoys and deputies from all parts of Asia and eastern Europe, bearing homage, tribute and presents. They afterwards, on the 24th of August, witnessed the formal enthronement at another camp in the vicinity called the Golden Ordu, after which they were presented to the emperor. It was not till November that they got their dismissal, bearing a letter to the pope in Mongol, Arabic and Latin, which was little else than a brief imperious assertion of the khan's office as the scourge of God. Then commenced their long winter journey homeward; often they had to lie on the bare snow, or on the ground scraped bare of snow with the traveller's foot. They reached Kiev on the 9th of June 1247. There, and on their further journey, the Slavonic Christians welcomed them as risen from the dead, with festive hospitality. Crossing the Rhine at Cologne, they found the pope still at Lyons, and there delivered their report and the khan's letter.

Not long afterwards Friar Joannes was rewarded with the archbishopric of Antivari in Dalmatia, and was sent as legate to St Louis. The date of his death may be fixed, with the help of the *Franciscan Martyrology* and other authorities, as the 1st of August 1252; hence it is clear that John did not long survive the hardships of his journey.

He recorded the information that he had collected in a work, variously entitled in the MSS. *Historia Mongalorum quos nos Tartaros appellamus*, and *Liber Tartarorum*, or *Tatarorum*. This treatise is divided into eight ample chapters on the country, climate, manners, religion, character, history, policy and tactics of the Tatars, and on the best way of opposing them, followed by a single (ninth) chapter on the regions passed through. The book thus answers to its title. Like some other famous medieval itineraries it shows an entire absence of a traveller's or author's egotism, and contains, even in the last chapter, scarcely any personal narrative. Carpini was not only an old man when he went cheerfully upon this mission, but was, as we know from accidental evidence in the annals of his order, a fat and heavy man (*vir gravis et corpulentus*), insomuch that during his preachings in Germany he was fain, contrary to Franciscan precedent, to ride a donkey. Yet not a word approaching more nearly to complaint than those which we have quoted above appears in his narrative. His book, both as to personal and geographical detail, is inferior to that written a few years later by a younger brother of the same Order, Louis IX.'s most noteworthy envoy to the Mongols, William of Rubrouck or Rubruquis. But in spite of these defects, due partly to his conception of his task, and in spite of the credulity with which he incorporates the Oriental tales, sometimes of childish absurdity, from which Rubruquis is so free, Friar Joannes' *Historia* is in many ways the chief literary memorial of European overland expansion before Marco Polo. It first revealed the Mongol world to Catholic Christendom; its account of Tatar manners, customs and history is perhaps the best treatment of the subject by any Christian writer of the middle ages. We may especially notice, moreover, its four name-lists:—of the nations conquered by the Mongols; of the nations which had up to this time (1245-1247) successfully resisted; of the Mongol princes; and of the witnesses to the truth of his narrative, including various merchants trading in Kiev whom he had met. All these catalogues, unrivalled in Western medieval literature, are of the utmost historical value. To the accuracy of Carpini's statements upon Mongol life, a modern educated Mongol, Galsang Gomboyev, has borne detailed and interesting testimony (see *Mélanges asiat. tirés du Bullet. Hist. Philol. de l'Acad. Imp. de St Pétersbourg*, ii. p. 650, 1856).

The book must have been prepared immediately after the return of the traveller, for the Friar Salimbeni, who met him in France in the year of his return (1247), gives us these interesting particulars:—"He was a clever and conversable man, well lettered, a great

discourser, and full of a diversity of experience.... He wrote a big book about the Tattars (*sic*), and about other marvels that he had seen, and whenever he felt weary of telling about the Tattars, he would cause that book of his to be read, as I have often heard and seen" ("Chron. Fr. Salimbeni Parmensis" in *Monum. Histor. ad Prov. et Placent. pertinentia*, Parma, 1857).

For a long time the work was but partially known, and that chiefly through an abridgment in the vast compilation of Vincent of Beauvais (*Speculum Historiale*) made in the generation following the traveller's own, and printed first in 1473. Hakluyt (1598) and Bergeron (1634) published portions of the original work; but the complete and genuine text was not printed till 1838, when it was put forth by the late M. D'Avezac, an editorial masterpiece, embodied (1839) in the 4th volume of the *Recueil de voyages et de mémoires* of the Geographical Society of Paris.

Joannes' companion, Benedictus Polonus, also left a brief narrative taken down from his oral relation. This was first published by M. D'Avezac in the work just named.

The following four MSS. may be noticed: (1) "Corpus," *i.e.* Corpus Christi College, Cambridge, No. 181; (2) "Petau," *i.e.* Leiden University, 77 (formerly 104)—both these are certainly earlier than 1300; (3) "Colbert," *i.e.* Paris, National Library, Fonds Lat. 2477, of about 1350; (4) "London-Lumley," *i.e.* London, British Museum, MSS. Reg. 13 A xiv., of late 13th century. Three other MSS. certainly exist; yet six more are perhaps to be found, but none of these possesses the value of those given above. Besides the editions referred to in the body of the article, we may also mention (1) P. Girolamo Golubovich, *Biblioteca bio-bibliografica della Terra Santa e dell' Oriente Francescano* (1906), vol. i. (1215-1300), pp. 190-213; (2) *William of Rubruck ... with ... John of Pian de Carpine*, edited by W.W. Rockhill, Hakluyt Society (1900), especially pp. 1-39; (3) C. Raymond Beazley, *Dawn of Modern Geography*, ii. (1901), 279-317, 375-380; in. 85, 544, 553; and *Carpini and Rubruquis*, Hakluyt Society (1903), especially pp. vii.-xviii. 43-144, 249-295.

(H. Y.; C. R. B.)

CARPOCRATES, a Gnostic of the 2nd century, about whose life and opinions comparatively little is known. He is said to have been a native of Alexandria and by birth a Jew. His family, however, seem to have been converted to Christianity. With Epiphanes, his son, he was the leader of a philosophic school basing its theories mainly upon Platonism, and striving to amalgamate Plato's *Republic* with the Christian ideal of human brotherhood. The image of Jesus was crowned along with those of Pythagoras, Plato and Aristotle. Carpocrates made especial use of the doctrines of reminiscence and pre-existence of souls. He regarded the world as formed by inferior spirits who are out of harmony with the supreme unity, knowledge of which is the true *Gnosis*. The souls which remember their pre-existing state can attain to this contemplation of unity, and thereby rise superior to all the ordinary doctrines of religion or life. Jesus is but a man in whom this reminiscence is unusually strong, and who has consequently attained to unusual spiritual excellence and power. To the Gnostic the things of the world are worthless; they are to him matters of indifference. From this position it easily followed that actions, being merely external, were morally indifferent, and that the true Gnostic should abandon himself to every lust with perfect indifference. The express declaration of these antinomian principles is said to have been given by Epiphanes. The notorious licentiousness of the sect was the carrying out of their theory into practice.

CARPZOV (Latinized *Carpzovius*), the name of a family, many of whose members attained distinction in Saxony in the 17th and 18th centuries as jurists, theologians and statesmen. The family traced its origin to Simon Carpzov, who was burgomaster of Brandenburg in the middle of the 16th century, and who left two sons, Joachim (d. 1628), master-general of the ordnance in the service of the king of Denmark, and Benedikt (1565-1624), an eminent jurist.

Benedikt Carpzov was born in Brandenburg on the 22nd of October 1565, and after studying at Frankfort and Wittenberg, and visiting other German universities, was made doctor of laws at Wittenberg in 1590. He was admitted to the faculty of law in 1592, appointed

professor of institutions in 1599, and promoted to the chair *Digesti infortiati et novi* in 1601. In 1602 he was summoned by Sophia, widow of the elector Christian I. of Saxony, to her court at Colditz, as chancellor, and was at the same time appointed councillor of the court of appeal at Dresden. After the death of the electress in 1623 he returned to Wittenberg, and died there on the 26th of November 1624, leaving five sons. He published a collection of writings entitled *Disputationes juridicae*.

Benedikt Carpzov (1595-1666), second of the name, was the second son of the preceding, and like him was a great lawyer. He was born at Wittenberg on the 27th of May 1595, was at first a professor at Leipzig, obtained an honourable post at Dresden in 1639, became ordinary of the faculty of jurists at Leipzig in 1645, and was named privy councillor at Dresden in 1653. Among his works which had a very extensive influence on the administration of justice, even beyond the limits of Saxony, are *Definitiones forenses* (1638), *Practica nova Imperialis Saxonica rerum criminalium* (1635), *Opus decisionum illustrium Saxoniae* (1646), *Processus juris Saxonici* (1657), and others. He did much, both by his writings and by his official work, to systematize the body of German jurisprudence which had resulted from the intersection of the common law of Saxony with the Roman and Canon laws. His last years were spent at Leipzig, and his time was entirely devoted to sacred studies. He read the Bible through fifty-three times, studying also the comments of Osiander and Cramer, and making voluminous notes. These have been allowed to remain in manuscript. He died at Leipzig on the 30th of August 1666.

Johann Benedikt Carpzov (1607-1657), fourth son of the first Benedikt, was born at Rochlitz in 1607. He became professor of theology at Leipzig in 1643, made himself chiefly known by his *Isagoge in Libros Ecclesiarum Lutheranarum Symbolicos* (published in 1665), and died at Leipzig on the 22nd of October 1657, leaving five sons, all of whom attained some literary eminence.

August Carpzov (1612-1683), fifth son of the first Benedikt, distinguished himself as a diplomatist. Born at Colditz on the 4th of June 1612, he studied at the universities of Wittenberg, Leipzig and Jena, and in 1637 was appointed advocate of the court of justice (*Hofgericht*) at Wittenberg. Entering the service of Frederick William II., duke of Saxe-Altenburg, he took part in the negotiations which led to the peace of Westphalia in 1648, and was appointed chancellor by the duke in 1649. From 1672 to 1680 he was chief minister of Ernest I. and Frederick I., dukes of Saxe-Coburg-Gotha, and died at Coburg on the 19th of November 1683. August, who was a man of earnest piety, wrote *Der gekreuzigte Jesus* (1679) and some treatises on jurisprudence.

Johann Gottlob Carpzov (1670-1767), grandson of Johann Benedikt, was born at Dresden in 1679. He was educated at Wittenberg, Leipzig and Altdorf, became a learned theologian, and in 1719 was appointed professor of Oriental languages at Leipzig. In 1730 he was made superintendent and first pastor at Lübeck. His most important works were the *Introductio in libros canonicos bibliorum Veteris Testamenti* (1721), *Critica sacra V.T.* (1728), and *Apparatus Historico-criticus Antiquitatum V. Test.* (1748). He died at Lübeck on the 7th of April 1767.

Johann Benedikt Carpzov (1720-1803), great-grandson of the first Johann Benedikt, was born at Leipzig, became professor of philosophy there in 1747, and in the following year removed to Helmstädt as professor of poetry and Greek. In 1749 he was named also professor of theology. He was author of various philological works, wrote a dissertation on Mencius, and published an edition of Musaeus. He died on the 28th of April 1803.

On the family of Carpzov, see Dreyhaupt, *Beschreibung des Saalkreises*, Beilagen zu Theil 2. S. 26.

CARRANZA, BARTOLOMÉ (1503-1576), Spanish theologian, sometimes called de Miranda or de Carranza y Miranda, younger son of Pedro Carranza, a man of noble family, was born at Miranda d'Arga, Navarre, in 1503. He studied (1515-1520) at Alcalá, where Sancho Carranza, his uncle, was professor; entering (1520) the Dominican order, and then (1521-1525) at Salamanca and at Valladolid, where from 1527 he was teacher of theology. No Spaniard save Melchior Canus rivalled him in learning; students from all parts of Spain flocked to hear him. In 1530 he was denounced to the Inquisition as limiting the papal power and leaning to opinions of Erasmus, but the process failed; he was made professor of

philosophy and (1533-1539) regent in theology. In 1539, as representative to the chapter-general of his order he visited Rome; here he was made doctor of theology, and while he mixed with the liberal circle associated with Juan de Valdés, he had also the confidence of Paul III. Returning to Valladolid, he acted as censor (*cualificador*) of books (including versions of the Bible) for the Inquisition. In 1540 he was nominated to the sees of Canaria and of Cusco, Peru, but declined both. Charles V. chose him as envoy to the council of Trent (1546). He insisted on the imperative duty of bishops and clergy to reside in their benefices, publishing at Venice (1547) his discourse to the council *De necessaria residentia personali*, which he treated as *juris divini*. His Lenten sermon to the council, on justification, caused much remark. He was made provincial of his order for Castile. Charles sent him to England (1554) with his son Philip on occasion of the marriage with Mary. He became Mary's confessor, and laboured earnestly for the re-establishment of the old religion, especially in Oxford. In 1557 Philip appointed him to the archbishopric of Toledo; he accepted with 400
reluctance, and was consecrated at Brussels on the 27th of February 1558. He was at the deathbed of Charles V. (21st of September) and gave him extreme unction; then raised a curious controversy as to whether Charles, in his last moments, had been infected with Lutheranism. The same year he was again denounced to the Inquisition, on the ground of his *Comentarios sobre el Catechismo* (Antwerp, 1558), which in 1563, however, was approved by a commission of the council of Trent. He had evidently lost favour with Philip, by whose order he was arrested at Tordelaguna (1559) and imprisoned for nearly eight years, and the book was placed on the Index. The process dragged on. Carranza appealed to Rome, was taken thither in December 1566, and confined for ten years in the castle of St Angelo. The final judgment found no proof of heresy, but compelled him to abjure sixteen errors, rather extorted than extracted from his writings, suspended him from his see for five years, and secluded him to the Dominican cloister of Sta Maria sopra Minerva. Seven days after his abjuration he died, on the 2nd of May 1576. He was succeeded in his see by the inquisitor-general, Gaspar Quiroga. Yet the Spanish people honoured him as a saint; Gregory XIII. placed a laudatory inscription on his tomb in the church of Sta Maria. His real crime was not heresy but reform. His *Summa Conciliorum et Pontificum* (Venice, 1546) has been often reprinted (as late as 1821), and has permanent value.

See P. Salazar de Miranda, *Vida* (1788); H. Laugwitz, *Bartholomaus Carranza* (1870); J.A. Llorente, *Hist. Inquisition in Spain* (English abridgment, 1826); Hefele in I. Goschler's *Dict. encyclopédique de la théol. cath.* (1858).

(A. Go.*)

CARRARA, or Carraresi, a powerful family of Longobard origin which ruled Padua in the 14th century. They take their name from the village of Carrara near Padua, and the first recorded member of the house is Gamberto (d. before 970). In the wars between Guelphs and Ghibellines the Carraresi at first took the latter side, but they subsequently went over to the Guelphs. This brought them into conflict with Ezzelino da Romano; Jacopo da Carrara was besieged by Ezzelino in his castle of Agna, and while trying to escape was drowned. Another Jacopo led the Paduans in 1312 against Cangrande della Scala, lord of Verona, and though taken prisoner managed to negotiate a peace in 1318. To put an end to the perpetual civil strife the Paduans elected him their lord, and he seems to have governed well, leaving the city at his death (1324) to his nephew Marsiglio a man famed for his cunning. But Cangrande was bent on acquiring Padua, and Marsiglio, unable to resist, gave it over to him and was appointed its governor. Cangrande died in 1319, being succeeded by his nephew Martino, and Marsiglio soon began to meditate treachery; he negotiated with the Venetians in 1336, and in the following year he secretly introduced Venetian troops into Padua, arrested Alberto della Scala, Martino's brother, then in charge of the town, and thus regained the lordship. He died in 1338, and was succeeded by his relative Ubertino, a typical medieval tyrant, who earned an unenviable notoriety for his murders and acts of treachery, but was also a patron of the arts; he built the Palazzo dei Principi, the castle of Este, constructed a number of roads and canals, and protected commerce. He died in 1345. His distant kinsman Marsiglietto da Carrara succeeded to him, but was immediately assassinated by Jacopo da Carrara, a prince famed as the friend of Petrarch. In 1350 Jacopo was murdered by Guglielmo da Carrara, and his brother Jacopino succeeded, reigning together with his nephew Francesco.

In 1355 Francesco (il Vecchio) rose against his uncle and imprisoned him. Francesco changed the traditional policy of his house by quarrelling with the Venetians, in the hope of

obtaining more advantages from the Visconti of Milan. When the former were at war with Hungary over Dalmatia in 1356 and asked Carrara to help them, he refused. Their resentment was all the more bitter when at the instance of the pope he mediated between them and Hungary and brought about peace on terms unfavourable to the republic. He received Feltre, Belluno and Cividale from the Hungarian king, but in 1369 a frontier dispute led to war between him and Venice. After some defeats, Venice was victorious and dictated peace; Carrara had to pay a huge indemnity and ask the republic's pardon (1373). In 1378 he joined the league against Venice formed by Genoa, Hungary and the Scala, and took part in the siege of Chioggia. But the Venetians were victorious, and by the peace of Turin Carrara found himself in the *status quo ante*, but he bought Treviso from Austria, to whom Venice had given it in the day of her trouble. In 1385 the Venetians set the Scala against Carrara, who thereupon allied himself with the treacherous Gian Galeazzo Visconti. The Scala were expelled from Verona, but Carrara and Visconti quarrelled over the division of the spoils. Visconti was determined to capture Padua as well as Verona, and made an alliance with Venice and the house of Este for the purpose. Francesco, seeing that the situation was hopeless, surrendered to Visconti, in whose hands he remained a prisoner until his death in 1392.

Francesco Novello, his son, resisted bravely, but was compelled to surrender owing to dissensions in Padua itself. He was forced to renounce his dominions, and received a castle near Asti, but he escaped to France, and after a series of romantic adventures succeeded in making peace with Venice, who was becoming alarmed at the restless ambition and treachery of Visconti; in 1390 he raised a small armed force and seized Padua, where he was enthusiastically welcomed by the citizens, and for several years reigned there in peace. But in 1399 Visconti recommenced his wars of conquest, which were to have included Padua had not death cut short his schemes in 1402. Carrara then allied himself with Guglielmo Scala, seized Verona, and tried to capture Vicenza. But the Vicentini had always hated the Carraresi, and after a short siege gave themselves over to Venice. This led to a war between that republic and Padua, for now that Visconti was dead the Venetians had no longer any reason to protect Carrara. Padua and Verona were besieged; the latter, defended by Novello's son Jacopo, was soon captured. Novello himself, besieged in his capital, although repeatedly offered favourable terms, held out for some months hoping for help from Florence and also from certain Venetian nobles with whom he was intriguing. Hunger, plague, the treachery of his captains and internal discontent at last forced him to surrender (November 1405). He and his sons Francesco III. and Jacopo were conveyed to Venice, and at first treated with consideration; but when their intrigues with Venetian traitors for the overthrow of the republic came to light, they were tried, condemned, and strangled in prison (1406). Novello's other son Marsiglio made a desperate attempt to recover Padua in 1435, but was discovered and killed. With him the house of Carrara ceased from troubling.

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(L. V.*)

CARRARA, a town of Tuscany, Italy, in the province of Massa e Carrara, 390 ft. above sea-level, 3 m. by rail N.N.E. of Avenza, which is 16 m. E.S.E. of Spezia. Pop. (1881) 26,325; (1905) town, 38,100; commune, 48,493. The cathedral (1272-1385) is a fine Gothic building dating from the period of Pisan supremacy; the other churches, and indeed all the principal buildings of the town, are constructed of the local marble, to which the place owes its importance. The Accademia di Belle Arti contains several Roman antiquities found in the quarries, and some modern works by local sculptors. A large theatre was inaugurated in 1892. Some of the quarries were worked in Roman times (see LUNA), but were abandoned after the downfall of the western empire, until the growth of Pisan architecture and sculpture in the 12th and 13th centuries created a demand for it. The quarries now extend over almost the whole of the Apuan Alps, and some 600 of them are being worked, of which 345, with 4400 workmen, are at Carrara itself, and 50 (700 men) at Massa. The amount exported in 1899 was 180,000 tons. The quarries are served by a separate railway, with several branch

lines.

CARREL, JEAN BAPTISTE NICOLAS ARMAND (1800-1836), French publicist, was born at Rouen on the 8th of May 1800. His father was a merchant in good circumstances, and he received a liberal education at the college of Rouen, afterwards attending the military school at St Cyr. He had an intense admiration for the great generals of Napoleon, and his uncompromising spirit, bold uprightness and independent views marked him as a man to be suspected. Entering the army as sub-lieutenant he took a secret but active part in the unsuccessful conspiracy of Belfort. On the outbreak of war with Spain in 1823, Carrel, whose sympathies were altogether with the liberal cause, sent in his resignation, and succeeded in effecting his escape to Barcelona. He enrolled himself in the foreign legion and fought gallantly against his former comrades. Near Figuières the legion was compelled to surrender, and Carrel became the prisoner of his old general, Damas. There was considerable difficulty about the terms of capitulation, and one council of war condemned Carrel to death. Fortunately some informality prevented the sentence being executed, and he was soon afterwards acquitted and set at liberty. His career as a soldier being then finally closed, Carrel resolved to devote himself to literature. He came to Paris and began as secretary to Augustin Thierry, the historian. His services were found to be of great value, and he not only obtained admirable training in habits of composition, but was led to investigate for himself some of the most interesting portions of English history. His first work of importance (he had already written one or two historical abstracts) was the *History of the Counter-Revolution in England*, an exceedingly able political study of the events which culminated in the Revolution of 1688. He gradually became known as a skilful writer in various periodicals; but it was not till he formed his connexion with the *National* that he became a power in France. The *National* was at first conducted by Thiers, Mignet and Carrel in conjunction; but after the revolution of July, Thiers and Mignet assumed office, and the whole management fell into the hands of Carrel. Under his direction this journal became the first political organ in Paris. His judgment was unusually clear, his principles solid and well founded, his sincerity and honesty beyond question; and to these qualities he united an admirable style, lucid, precise and well balanced. As the defender of democracy he had frequently to face serious dangers. He was once in Ste Pelagie, and several times before the tribunal to answer for his journal. Nor was he in less danger from private enmities. Before his last fatal encounter he was twice engaged in duels with editors of rival papers. The dispute which led to the duel with Émile de Girardin was one of small moment, and might have been amicably arranged had it not been for some slight obstinacy on Carrel’s part. The meeting took place on the morning of the 22nd of July 1836. De Girardin was wounded in the thigh, Carrel in the groin. The wound was at once seen to be dangerous, and Carrel was conveyed to the house of a friend, where he died after two days’ suffering.

His works, with biographical notice by Littré, were published in five volumes (Paris, 1858), A fine estimate of his character will be found in Mill’s *Dissertations*, vol. i.

CARRERA, JOSÉ MIGUEL (1785-1821), the principal leader in the early fighting for the independence of Chile, was born at Santiago on the 15th of October 1785. Sent to Spain for a military career, he served in the Spanish army in the Napoleonic war, but returned to Chile in July 1811, where his vigorous character and military experience enabled him by means of a series of coup d’etats to place himself at the head of the nationalist government. Though at first he laboured patriotically to establish a stable administration, to promote education, and to organize the Chilean forces, his selfish arrogant spirit produced dissensions between himself and other patriots, and it was his rivalry with Bernardo O’Higgins that led to the defeat of the nationalist forces at Rancagua in 1814. In the expedition of 1817, led by José de San Martin and Bernardo O’Higgins, which resulted in the liberation of Chile, Carrera had no share, owing to his hostility to the leaders, but he attempted to procure in the United States materials for a fresh enterprise of his own. The Argentine government, however, suspicious of his intentions, would not allow him to go to Chile, and Carrera, enraged by this treatment

and by the execution of his brothers at Mendoza by the San Martin party, proceeded to organize rebellion in Argentina, but was eventually captured and shot at Mendoza on the 4th of September 1821.

See A. Valdes, *Revolucion Chilena y Campañas de la Independencia* (Santiago, 1888), which is practically a vindication of Carrera's career; also P.B. Figueroa, *Diccionario biografico de Chile, 1550-1887* (Santiago, 1888), and J.B. Suarez, *Rasgos biograficos de hombres notables de Chile* (Valparaiso, 1886), both giving biographical sketches of prominent characters in Chilean history.

CARRIAGE, a term which in its widest signification is used, as its derivation permits, for any form of "carrying"; thus, a person's "carriage" is still spoken of in the sense of the way he bears himself. But it is more specifically the general term for all vehicular structures employed for the purposes of transport of merchandise and movable goods and of human beings. Such vehicles are generally mounted on wheels, but the sledge and the litter are types of the exception to this rule. Within this definition a vast variety of forms is included, ranging from the coster's barrow and rude farm-cart up to the luxuriously appointed sleeping-cars of railways and the state carriages of royal personages. A narrower application, however, limits the term to such vehicles as are used for the conveyance of persons and are drawn by horses, and it is with carriages in this restricted sense that we are here concerned. Tramcars, railway carriages and motor-cars are dealt with in other articles.

History.—A wheeled carriage appears to have been in very general use in Egypt at an early period, called a car or chariot (*q.v.*); in the Bible the word is usually translated "chariot." The bodies of these chariots were small, usually containing only two persons standing upright. They were very light, and could be driven at great speed. They were narrow, and therefore suitable to Eastern cities, in which the streets were very narrow, and to mountainous roads, which were often only 4 ft. wide. From Egypt the use of chariots spread into other countries, and they were used in war in large numbers on the great plains of Asia. We read of the 900 chariots of Jabin, king of Canaan; how David took 700 chariots from the kings of Syria and 1000 from the king of Zobah. Solomon had 1400 chariots, and his merchants supplied northern Syria and the surrounding countries with chariots brought out of Egypt at 600 shekels (about £50) apiece. From the ancient sculptures preserved from Nineveh and Babylon, some of which are in the British Museum, we observe the use of chariots continued for the purpose of hunting as well as for war. Homer describes the chief warriors on both sides at the siege of Troy as going into battle and fighting from their chariots. The Roman nation as it increased in power adopted the car, though chiefly for purposes of show and state. A beautiful marble model of one of these still exists at the Vatican in Rome: a copy of it and the horses drawing it is in the museum at South Kensington. The war chariots used by the Persians were larger; the idea seems to have been to form a sort of turret upon the car, from which several warriors might shoot or throw their spears. These chariots were provided with curved blades projecting from the axle-trees. Alexander the Great, king of Macedon, invading Asia was met upon the banks of the river Indus by King Porus, in whose army were a number of elephants and also several thousand chariots. On Alexander's return from India towards Persia, he travelled in a chariot drawn by eight horses, followed by an innumerable number of others covered with rich carpets and purple coverlets. After Alexander's death a funeral car was prepared to convey his body from Babylon to Alexandria in Egypt, and this car has perhaps never been excelled in the annals of coach-building. It was designed by the celebrated architect Hieronymus, and took two years to build. It was 18 ft. long and 12 ft. wide, on four massive wheels, and drawn by sixty-four mules, eight abreast. The car was composed of a platform, with a lofty roof, supported by eighteen columns, and was profusely adorned with drapery, gold and jewels; round the edge of the roof was a row of golden bells; in the centre was a throne, and before it the coffin; around were placed the weapons of war and the armour that Alexander had used.

The Romans established the use of carriages as a private means of conveyance, and with them carriages attained great variety of form as well as richness of ornamentation. In all times the employment of carriages depended greatly on the condition of the roads over which they had to be driven, and the establishment of good roads, such as the Appian Way, constructed 331 B.C., and others, greatly facilitated the development of carriage travelling among the Romans. In Rome itself, and probably also in other large towns, it was necessary

to restrict travelling in carriages to a few persons of high rank, owing to the narrowness and crowded state of the streets. For the same reason the transport of goods along the streets was forbidden between sunrise and sunset. For long journeys and to convey large parties the *reda* and *carruca* appear to have been mostly used, but what their construction and arrangements were is not known. During the empire the carriage which appears in representations of public ceremonials is the *carpentum*. It is very slight, with two wheels, sometimes covered, and generally drawn by two horses. If a carriage had four horses they were yoked abreast, among the Greeks and Romans, not in two pairs as now. From the *carruca* are traced the modern European names,—the English *carriage*, the French *carrosse* and the Italian *carrozza*. The *sirpea* was a very ancient form of vehicle, the body of which was of osier basket-work. It originated with the Gauls, by whom it was named *lenna*, and by them it was employed for the conveyance of persons and goods in time of peace, and baggage during war. With its name are connected the modern French *banne, banneton, vannerie* and *panier*,—all indicating basket-work.

The ancient Britons used a car for warlike purposes which was evidently new to the Romans. It was open in front, instead of at the back as in their cars; and the pole, which went straight out between the horses, was broad, so that the driver could walk along, and if needful drive from the end. Above all, it possessed a seat, and was called *essedum* from this peculiarity. For war purposes this car was provided with scythes projecting from the ends of the axle-trees. Cicero, writing to a friend in Britain, remarks “that there appeared to be very little worth bringing away from Britain except the chariots, of which he wished his friend to bring him one as a pattern.”

The Roman vehicles were sometimes very splendidly ornamented with gold and precious stones; and covered carriages seem more and more to have become appendages of Roman pomp and magnificence. Sumptuary laws were enacted on account of the public extravagance, but they were little regarded, and were altogether abrogated by the emperor Alexander Severus. Suetonius states that Nero took with him on his travels no less than a thousand carriages.

On the introduction of the feudal system the use of carriages was for some time prohibited, as tending to render the vassals less fit for military service. Men of all grades and professions rode on horses or mules, and sometimes the monks and women on she-asses. Horseback was the general mode of travelling; and hence the members of the council, who at the diet and on other occasions were employed as ambassadors, were called *Rittmeister*. In this manner also great lords made their public entry into cities.

Covered carriages (see Coach) were known in the beginning of the 15th century, but their use was confined to ladies of the first rank; and as it was accounted a reproach for men to ride in them, the electors and princes sometimes excused their non-attendance at meetings of the state by the plea that their health would not permit them to ride on horseback. Covered carriages were for a long time forbidden even to women; but about the end of the 15th century they began to be employed by the emperor, kings and princes in journeys, and afterwards on state occasions. In 1474 the emperor Frederick III. visited Frankfort in a close carriage, and again in the following year in a very magnificent covered carriage. Shortly afterwards carriages began to be splendidly decorated; that, for instance, of the electress of Brandenburg at the tournament held at Ruppin in 1509 was gilded all over, and that of the duchess of Mecklenburg was hung with red satin. When Cardinal Dietrichstein made his entrance into Vienna in 1611, forty carriages went to meet him; and in the same year the consort of the emperor Matthias made her public entrance on her marriage in a carriage covered with perfumed leather. The wedding carriage of the first wife of the emperor Leopold, who was a Spanish princess, cost, together with the harness, 38,000 florins. Those of the emperor are thus described: “In the imperial coaches no great magnificence was to be seen; they were covered over with red cloth and black nails. The harness was black, and in the whole work there was no gold. The panels were of glass, and on this account they were called the imperial glass coaches. On festivals the harness was ornamented with red silk fringes. The imperial coaches were distinguished only by their having leather traces; but the ladies in the imperial suite were obliged to be contented with carriages the traces of which were made of ropes.” At the magnificent court of Duke Ernest Augustus at Hanover, in 1681, there were fifty gilt coaches with six horses each. The first time that ambassadors appeared in coaches on a public solemnity was at the imperial commission held at Erfurt in 1613. Soon after this time coaches became common all over Germany, notwithstanding various orders and admonitions to deter vassals from using them. These vehicles appear to have been of very rude construction. Beckmann describes a view he had seen of Bremen, painted by John Landwehr in 1661, in which was represented a long quadrangular carriage, apparently not suspended by straps, and covered with a canopy supported by four pillars, but without

curtains. In the side was a small door, and in front a low seat or box; the coachman sat upon the horses; and the dress of the persons within proved them to be burgomasters. At Paris in the 14th, 15th and even 16th centuries, the French monarchs rode commonly on horses, the servants of the court on mules, and the princesses and principal ladies sometimes on asses. Persons even of the highest rank sometimes sat behind their equerry on the same horse. Carriages, however, were used at a very early period in France; for there is still extant an ordinance of Philip the Fair, issued in 1294, by which citizens' wives are prohibited from using them. It appears, however, that about 1550 there were only three carriages at Paris,—one belonging to the queen, another to Diana of Poitiers, and the third to René de Laval, a very corpulent nobleman who was unable to ride on horseback. The coaches used in the time of Henry IV. were not suspended by straps (an improvement referred to the time of Louis XIV.), though they were provided with a canopy supported by four ornamental pillars, and with curtains of stuff or leather.

Occasional allusion is made to the use of some kinds of vehicles in England during the middle ages. In *The Squyr of Low Degree*, a poem of a period anterior to Chaucer, a description of a sumptuous carriage occurs:

"To-morrow ye shall on hunting fare
And ride, my daughter, in a chare.
It shall be cover'd with velvet red,
And cloth of fine gold all about your head,
With damask white and azure blue
Well diaper'd with lilies new."

Chaucer himself describes a chare as

"With gold wrought and pierrie."

When Richard II. of England, towards the end of the 14th century, was obliged to fly before his rebellious subjects, he and all his followers were on horseback, while his mother alone used a carriage. The oldest carriages used in England were known as chares, cars, chariots, caroches and whirlicotes; but these became less fashionable when Ann, the wife of Riehard II., showed the English ladies how gracefully she could ride on the side-saddle, Stow, in his *Survey of London*, remarking, "so was riding in those whirlicotes and chariots forsaken except at coronations and such like spectacles."

There were curious sumptuary laws enacted during the 16th century in various Italian cities against the excessive use of silk, velvet, embroidery and gilding, on the coverings of coaches and the trappings of horses. In 1564 Pope Pius IV. exhorted the cardinals and bishops not to ride in coaches, according to the fashion of the times, but to leave such things to women, and themselves ride on horseback. The use of coaches in Germany in the 16th century was not less common than in Italy. The current of trade, especially from the East, had for a long time poured into those two countries towards Holland, enriching all the cities in its progress. Macpherson, in his *History of Commerce*, says that Antwerp possessed 500 coaches in 1560. France and England appear to have been behind the rest of Europe at this period.

The first coach in England was made in 1555 for the earl of Rutland by Walter Rippon, who also made a coach in 1556 for Queen Mary, and in 1564 a state coach for Queen Elizabeth. That one of the carriages used by Queen Elizabeth could be opened and closed at pleasure may be inferred from her causing at Warwick during one of her progresses—"every part and side of her coach to be opened that all her subjects present might behold her, which most gladly they desired."

Coaches of the type now properly so-called were first known in England about the year 1580, and were introduced, according to Stow, from Germany by Henry Fitzalan, 12th earl of Arundel. By the beginning of the 17th century the use of coaches had become so prevalent in England that in 1601 the attention of parliament was drawn to the subject, and a bill "to restrain the excessive use of coaches" was introduced, which, however, was rejected on the second reading. Their use told severely on the occupation of the Thames watermen, and Taylor the poet and waterman complained bitterly both in prose and verse against the new-fangled practice:—

"Carroaches, coaches, jades, and Flanders mares
Doe rob us of our shares, our wares, our fares.
Against the ground we stand and knock our heels

Whilest all our profit runs away on wheeles.”

The sneers of wits and watermen notwithstanding, coaches became so common, that in the early part of the 17th century they were estimated to number more than 6000 in London and its surrounding country.

We now arrive gradually at the modern conception of carriage-building. No trace of glass windows or complete doors for coaches seems to have existed up to 1650. But plain and rude as was the first coach of Louis XIV., it was in his reign, which lasted till 1715, that the most rapid progress was made. The credit for this is equally due to Germany, Italy, France and England. There is very little mention made by historians of steel springs, but they were first applied to wheel carriages about 1670, prior to which bodies were suspended by long straps from the four corners to pillars erected upon the under carriage. The great advantage of the introduction of springs was speedily recognized as reducing vibration, enabling carriages to be built much lighter and lessening the draught for the horses. In the diary of Samuel Pepys there are many amusing and interesting references to the art of coach-building, which was beginning to attract much attention at that period.

In the French *Encyclopédie* (1772) by Diderot there are elaborate descriptions of the art of coach-building, the workshops and tools used, and plates of the different carriages in use. The 18th century is remarkable for the rapid development which took place, more especially in the manufacture of state carriages of a sumptuous and ornate character, which were largely in demand by the various courts of Europe. One of the most beautiful of these is that belonging to the imperial family of Vienna, which was built in 1696, and is shaped with all the curves that are familiar to us in cabinets and furniture of the style of Louis XIV. The panels are beautifully painted with nymphs in the style of Rubens. There is an unusual quantity of plate glass in the panels, and on the centre of the roof is a large imperial crown. In 1757 was built the elaborate state coach of the city of London, and in 1761 the royal state coach of England, built for King George III. (see Coach). During the reigns of George II. and George III. all English manufactures had received an immense impulse from the energy of the men of the time, in which they were much encouraged by the action of the Society of Arts in offering money prizes for improvements; and in these coach-builders largely participated.

In the year 1804 Obadiah Elliot patented his plan for hanging vehicles upon elliptical springs, thus dispensing with the heavy wood and iron perch and cross beds, invariably used in four-wheeled carriages up to that time. Elliot was rewarded by the grant of a gold medal by the Society of Arts, and extensive orders for the carriages of a lighter character, which he was thus enabled to produce.

Of carriages much in fashion and characteristic of this period may be mentioned the “curricle,” a cabriolet (see below) on two wheels, driven with a pair of horses, the balance being secured by an ornamental bar across the horses’ backs, connected by a leather brace to a spring under the pole. For lack of perfect safety this was gradually superseded by the “gentleman’s cabriolet,” for one horse, on C springs, fitted with folding leather hood and platform behind, on which stood a youthful trim servant in top-boots, popularly termed a “tiger.” To produce this satisfactorily, the best coach-building talent was required, and to work it a horse of exceptional strength and breeding was needful, but when complete this equipage had a distinction never surpassed. During this period the pair-horse “mail phaeton” was introduced, and has enjoyed a long period of popularity. As a travelling carriage with the needful appointments the “britzska,” having a straight body with ogee curves at front and back, with single folding hood, and hung on C springs, was a distinctive and popular feature among carriages of the period from 1824 until after 1840. Of two-wheeled vehicles the “stanhope” and “tilbury” gigs, the “dog cart” and “tandem cart,” came into use during these years, and have afforded facilities of agreeable locomotion to many thousands of people at a moderate cost. But the greatest improvement of this period was the introduction of the “brougham.” Several attempts had been made to arrive at a light carriage of this description, but it was not until 1839 that a carriage was produced to a design adopted by Lord Brougham, and called after him. The “victoria” was known as a carriage for public hire in continental cities for several years before being adopted as a fashionable carriage by the wealthy classes. In 1869 the prince of Wales brought one from Paris of the cab shape, and Baron Rothschild brought one from Vienna of the square shape, examples speedily followed. In various elegant and artistic forms, either as an elliptic or C spring, it has since become a most popular and convenient carriage.

Public carriages for hire, or hackney (*q.v.*) coaches, were first established in London in 1625. In 1635 the number was restricted to fifty. Still they increased, notwithstanding the opposition of the court and king, who thought they would break up the roads, till in 1650

there were as many as 300. In Paris they were introduced during the minority of Louis XIV. by Nicholas Sauvage, who lived in the rue St Martin at the sign of St Fiacre, from which circumstance hackney carriages in Paris have since been called *fiacres*. In 1694 the number in London had increased to 700. Many of these were old private coaches of the nobility and gentry, and it was not until 1790 that coaches on a smaller scale were built specially for hackney purposes (see Coach).

We are told that in 1673 there were stage coaches from London to York, to Chester and to Exeter, having each forty horses on the road, and carrying each six inside-passengers. The coach occupied eight days travelling to Exeter. In 1706 a coach went from London to York every Monday, Wednesday and Friday, performing the journey in four days. In the same year there was a coach from London to Birmingham starting on Monday and arriving on Wednesday. In 1754 a coach was started from Manchester called the flying coach, which was advertised to reach London in four days and a half. In 1784 coaches became universal at the speed of 8 m. an hour.

In the year 1786 the prince of Wales, afterwards George IV., began to erect the pavilion at Brighton, and this led to a great increase of traffic, so that in 1820 no less than 70 coaches daily visited and left Brighton. The number continued to increase, until in 1835 there were as many as 700 mail coaches throughout Great Britain and Ireland. The system of road construction introduced by Mr McAdam during this time was of great value in facilitating this development. 404

Notwithstanding the competition of the sedan-chair (*q.v.*), the hackney-coach held its place and grew in importance, till it was supplanted about 1820 by the *cabriolet de place*, now shortened into “cab” (*q.v.*), which had previously held a most important place in Paris. In that city the cabriolet came into great public favour about the middle of the 18th century, and in the year 1813 there were 1150 such vehicles plying in the Parisian streets. The original cabriolet was a kind of hooded gig, inside which the driver sat, besides whom there was only room left for a single passenger. For hackney purposes Mr Boulnois introduced a four-wheeled cab to carry two persons, which was followed by one to carry four persons, introduced by Mr Harvey, the prototype of the London “four-wheeler.”

The hansom patent safety cab (1834) owes its invention to J.A. Hansom (*q.v.*), the architect of the Birmingham town-hall. This has passed through many stages of improvement with which the name of Forder of Wolverhampton is conspicuously associated.

The prototype of the modern “omnibus” first began plying in the streets of Paris on the 18th of March 1662, going at fixed hours, at a stated fare of five sous. Soldiers, lackeys, pages and livery servants were forbidden to enter such conveyances, which were announced to be *pour la plus grande commodité et liberté des personnes de mérite*. In the time of Charles X. the omnibus system in reality was established; for no exclusion of any class or condition of person who tendered the proper fare was permitted in the vehicles then put on various routes, and the fact of the carriages being thus “at the service of all” gave rise to the present name. The first London omnibus was started in July 1829 by the enterprising Mr Shillibeer. The first omnibuses were drawn by three horses abreast and carried twenty-two passengers, all inside. Though appearing unwieldy they were light of draught and travelled speedily. They were, however, too large for the convenience of street traffic, and were superseded by others carrying twelve passengers inside. In 1849 an outside seat along the centre of the roof was added. The London General Omnibus Company was founded in 1856; since then continual improvements in this system of public conveyance have been introduced.

Modern Private Carriages.—At the accession of Queen Victoria the means of travelling by road and horse-power, in the case of public coaches, had reached in England its utmost limits of speed and convenience, and the travelling-carriages of the nobility and the wealthy were equipped with the completest and most elaborate contrivances to secure personal comfort and safety. More particularly was this the case as regards continental tours, which had become indispensable to all who had at their command the means for this costly educational and pleasurable experience. Concurrently with this development the style and character of court equipages had also reached a consummate degree of splendour and artistic excellence. Not only was this the case in points of decoration, in which livery colour and heraldic devices were effectively employed, but also in the beauty of outline and skilful structural adaptation, in which respect carriages of that period made greater demands upon the capacity of the builder and the skill of the workman than do those of the present day. For this attainment the art of coachmaking was indebted to a very few leading men, whose genius has left its impress upon the art, and is still jealously cherished by those who in early life had experience of their achievements. The early portion of Queen Victoria’s reign was an age of much

emulation; the best-equipped carriages of that period, distinctive of noble families and foreign embassies, with their graceful outline and superb appointments, and harnessed to a splendid breed of horses—all harmoniously blended, perfect in symmetry and adaptation—gave to the London season, more especially on drawing-room days, and at other times in Hyde Park, an attractiveness unequalled in any other capital. After the death of the prince consort, the pageantry of that period very much declined and, except as an appendage of royalty, full-dress carriages have since been comparatively few, though there are hopes of a revival in this direction. Meanwhile, owing to the rapid development of railways and the wide extension of commerce, the demand for carriages greatly increased. The larger types gave place to others of a lighter build and more general utility, in which in some cases an infusion of American ideas made its appearance. In accordance with the universal rule of supply meeting the demand, Mr Stenson, an ironmaster of Northampton, was successful in producing a mild forging steel, which proved for some years, until the manufacture ceased, very conducive to the object of securing lightness with strength. In the early ’seventies the eminent mechanician, Sir Joseph Whitworth, in the course of his scientific studies in the perfecting of artillery, succeeded in manufacturing a steel of great purity, perfectly homogeneous and possessing marvellous tenacity and strength, known as “fluid compressed steel.” Incidentally carriage-building was able to participate in the results of this discovery. Two firms well known to Sir Joseph were asked to test its merits as a material applicable to this industry. In this test much difficulty was experienced, the nature of the steel not being favourable to welding, of which so much is required in the making of coach ironwork; but after much perseverance by skilful hands this was at length accomplished, and for some years there existed not a little rivalry in the use of this material, more especially in the case of carriages on the C and under-spring principle, which for lightness, elegance and luxurious riding left nothing to be desired. Many of these carriages may be referred to to-day as rare examples of constructive skill. Unfortunately, the original cost of the material, still more of the labour to be expended upon it, and the difficulty of educating men into the art of working it, were effectual barriers to its general adoption. The idea, however, had taken hold, and attention was given by other firms to the manufacture of the steel now in general use, admitting of easier application, with approximate, if not equal, results.

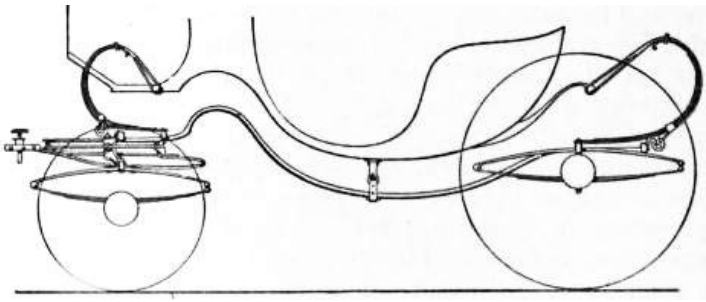

Fig. 1.

From C and under-spring carriages there arose another application of springs which was very prominently before the public during this period, by means of which it was professed that two drawbacks recognized in the C and under-spring carriages were obviated, which were caused by the perch or bar which passes under the body holding the front and hind parts in rigid connexion, and yet making use of a form of spring to which the same terms may be applied. These objections are the weight of the perch, and the limitation which it causes to the facility of turning, which in narrow roads and crowded thoroughfares is an inconvenience. The objection to weight is, however, minimized by the introduction of steel, and as the more advanced builders almost always construct the perch with a *forked* arch in front, allowing the wheels to pass under, the difficulty of a limited lock is in a great measure overcome (fig. 1). It must be noted, however (and this cannot be too emphatically stated), that the so-called C springs above referred to are not at all the same in action as the C spring proper; they are but an elongation of the ordinary elliptic spring in the form of the letter C (fig. 2), without adding anything to, but rather lessening their elasticity, and entirely ignoring the principle of *suspension* by leather braces over the C spring proper, by which alone the advantage of superior ease is to be obtained.

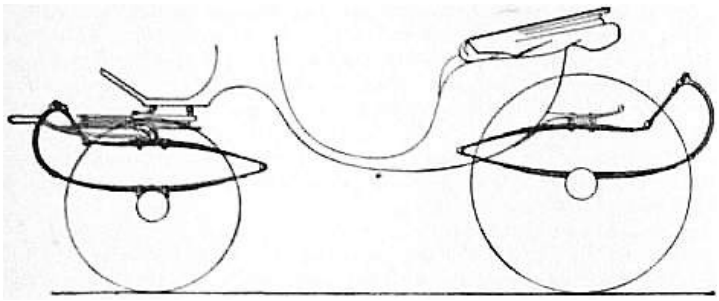

FIG. 2.

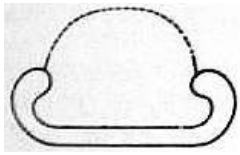

FIG. 3.

Another improvement which stamps the period under review is the introduction of indiarubber for the tires of wheels. To produce a carriage as nearly as possible free from noise and rattle has always been the aim of high-class coachmaking. A structure composed of wood, iron and glass, with axle-trees, doors, windows, lamps and other parts, in use upon the road in all weathers, must from time to time require some attention with this object. To meet this difficulty, the introduction of indiarubber has been received by carriage-users as a great boon. It was about the year 1852 that Mr Reading, who at that time was known as a builder of invalid carriages, conceived the idea of encircling wheels with that material, but his method only admitted of its use on vehicles travelling slowly over good roads. This was improved upon at a later date by Uriah Scott, who, taking advantage of the tempering capacity of indiarubber by the chemical action of sulphur, produced an inner rim of such density as to hold bolts, by which it could be secured through the felloe, forming a base for the outer covering of soft pliable rubber. This system was attended with satisfactory results, and was in favour for some years with persons whose health needed such provision. Another method, originated by Mr Mulliner of Liverpool in the early ’seventies, was to screw on iron flanges to the outer and inner sides of the felloes, having a kind of lip to press into the indiarubber filling the intervening space; but the cost of this—£36 per set—rendered its adoption prohibitive. Meanwhile another invention by Uriah Scott, afterwards improved upon by an American patentee, came into use; this was known as the “rubber-cushioned axle,” cylindrical rings being introduced between the axle-box and hub of the wheel, thus insulating the body of the carriage from the concussion of the road. This, however, necessitated the cutting away of so much of the timber of the hub as to impair its durability, and had, therefore, after a few years’ experience, to be abandoned in favour of an invention by a Parisian builder, who introduced indiarubber bearings between the spring and axle-tree. This was thoroughly practicable, and met with general acceptance, and it is still used in conjunction with iron and steel tires. In 1890 the pneumatic tire was first applied to road carriages. Its bulky appearance is a great drawback, contrasting strongly with the qualities which distinguish a graceful equipage; and in spite of its practical advantages it never became popular in England or America. In Paris and its neighbourhood and many parts of France, pneumatic tires are to be seen in frequent use both on public and private conveyances. In another form the indiarubber tire has become of almost universal application. Owing to an ingenious invention of Mr Carment, what appeared to be an insuperable difficulty in rolling a grooved tire was overcome (fig. 3). This so simplified the application as to bring the cost within practicable limits. The grooved tire is now made in several sections, in some of which the inward projection for securing the rubber is dispensed with, this being kept in position by wires running through the whole length, and electrically welded at the point of contact. Whatever be the method chosen for securing the tire, the best tires, both for durability and ease, are those in which the rubber provided is most resilient in its nature.

For the lifting and lowering of the hoods of victorias and other such carriages, and the opening and closing of landaus, there are now many automatic contrivances, of which the simplest are the most to be preferred. The quarter-light or five-glass landau is a carriage which has been greatly improved. The complicated adjustments of pillars, windows and roof have been replaced by one simple parallel movement. The first public exhibition of a finished carriage on this principle was by an English firm at the Paris Exhibition of 1876 (fig. 4).

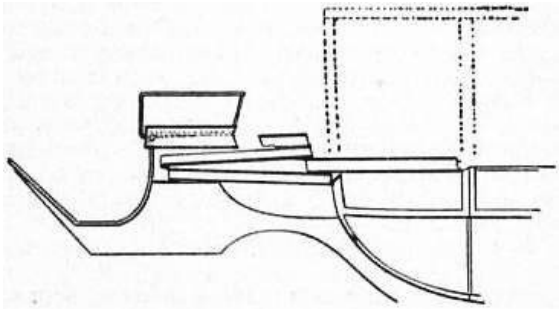

FIG. 4.

In the matter of style certain types of carriages have passed through marked changes. Extreme lightness was at one time considered by many the one desideratum both as to appearance and actual weight, in providing which ease of movement and comfortable seating of the occupants became secondary considerations—though to these extremes builders of repute were always opposed. Still, when at the International Exhibition of Paris 1889, it was seen that the Parisian builders had suddenly gone in the opposite direction, the world of fashion in carriages was taken by surprise. From being built upon easy, flowing, graceful lines, it was seen, with some revulsion of feeling, that these were to be displaced by the deep, full-bodied victoria, brougham and landau. Only by slow degrees did this characteristic find acceptance with English connoisseurs, and then only in a modified form, though eventually in a greater or less degree it is now the prevailing style.

While the better types of English carriages are still preeminent in their constructive qualities, and represent the well-known characteristics of individual firms, some emulation may be excited by the elegant taste and careful workmanship which French builders display in points of finish, both internally and externally. Of the various types of carriages now in vogue, the victoria, in its many varieties of form, is the most popular, accompanied, as of necessity, by the double victoria, sociable, brougham, landaulet and landau. Four-in-hand coaches for private use, as well as the “road” coaches, are built on a smaller scale than formerly; 6 ft. 8 in. may now be taken as the standard height of the roof from the ground. Owing to the encouragement given by the Four-in-hand and Coaching Clubs, the ascendancy of this style of driving is still preserved to Great Britain; and in association with it the char-à-banc, mail phaeton, wagonette, and four-wheel dog-cart retain their popularity. Of two-wheeled vehicles the polo-cart and ralli-cart are most in favour, to which may be added the governess-car, which is found convenient for many purposes not implied by its name. For a few years an effort was made, but with very indifferent success, to bring into fashion the tandem-cart, which may again be considered almost obsolete in England.

America has long held a prominent position in connexion with the carriage industry. In all the chief cities manufactories on a colossal scale are to be found, producing thousands of vehicles annually and equipped with the most perfect labour-saving machinery; and as vehicles of any particular pattern—many of small value—are required, not singly, but in large numbers, much economy is exercised in their manufacture. It is remarkable that, as a contrast to the popular buggy, wagon and rockaway of the United States, which are to be found in infinite variety, carriage establishments of the wealthy are not considered complete unless furnished with some of a European character, selected from the most eminent firms of London or Paris, in addition to others of their own manufacture. In Paris preference is given to an excess of bulk, with elaborate scroll ornamentation and diminutive windows, forming indeed, by reason of its exaggeration, a distinctive class. In respect of workmanship and finish, carriages by the best-known American builders leave nothing to be desired.

The International Exhibition of Paris 1900 brought together examples from various continental countries, in some of which a preference for curvilinear outline was displayed, but the best examples followed very closely the well-known English styles. In the French section it was interesting to find a revival of the once all-prevailing chariot, barouche and britzska, suspended on C and under-springs, with perch, but with ideas of lightness somewhat out of proportion to their general character.

Coach-making, or the carriage-manufacturing industry, is a combination of crafts rarely united in one trade, embracing as it does work in such divers materials as wood, iron, steel, brass, cloth, silk, leather, oils and colours, glass, ivory, hair, indiarubber, &c. Many divisions of labour and numerous highly-skilled artisans are consequently employed in the various stages in the construction of a high-class carriage. The workmen include body-makers, who build up the parts in which persons sit; carriage-makers, who make and fit together all the under parts of the vehicle on which the body rests; wheelwrights, joiners and fitters; several classes of smiths, for special work connected with the strengthening of the body framework

by means of long edge plates, the construction of under works, tiring and wheels, manufacture of springs, axle-trees, &c. Painting is an important part of the business, those professing it being divided into body, carriage and heraldry painters. Trimmers are needed who fit up the upholstery of the interior, and budget trimmers who sew on the patent leather covering to dasher wings, &c.

A very great deal in the coach-making industry depends upon the selection of materials. Ash is the kind of wood required in the framework both of body and carriage. The quality best suited for the body is that of full-grown mild and free nature; for the carriage that which is strong and robust; that for carriage-poles should be of younger growth, straight and tough in quality. An important consideration is the seasoning of this timber. Planks of various thicknesses are required, varying from 1½ in. to 6 in., the time required for seasoning being one year for every inch of thickness. After the framework is made, the body is panelled with ¼ in. mild Honduras mahogany, plain and free from grain, every joint and groove carefully coated with ground white lead to exclude water. The roof is covered with ¼ in. wide pine boards, unless when superseded by an American invention, by which, in order to obtain the needful width frequently of 5 ft. or upwards, boards are cut from the circumference of the tree, instead of through its diameter; three thicknesses of very thin wood are then glued together under pressure, the grain of the centre running across the outer plies, the whole forming a solid covering without joints. Birch and elm of 1 in. thickness also enter into the construction in many carriages; for floor and lining boards pine is the material used.

Wheel-making is a very important branch of the business, in which, owing to the increased lightness now required, many modern improvements have been introduced. The timber used in an ordinary carriage wheel is wych elm for the naves, heart of oak for the spokes, and ash for the felloes. American hickory has of late years been also largely used for spokes in exceptionally light wheels, as well as the American method of making the rim in two sections of straight-grained ash or hickory bent to the required circle. This method has much to recommend it, more especially for wheels with indiarubber tires, in which the wood felloes are not required to be nearly so deep as for steel tires. One well-known feature in light wheels is the “Warner nave,” which is a solid iron casting with mortices to receive the spokes, and being of small diameter gives the wheel a light appearance.

For springs the finest quality of steel is made from Swedish ore, but the ordinary English spring steel by the best makers leaves nothing to be desired. To secure the most perfect elasticity it is important that the tapering down of the ends of each plate should be done by hand labour on the anvil, and that the plates should not be more than ¼ in. in thickness. To obtain cheapness wholesale spring-makers adopt the method of squeezing the ends of spring plates between eccentric rollers, and so produce the tapered form, which, however, is too short and gives a lumpy and unsightly appearance to the spring when put together, so that by this they lose much of their pliability.

The iron mounting of coach work requires the skill of experienced smiths, and gives scope for much taste and judgment in shaping the work, and providing strength suited to the relative strain to which it will be subjected. Axle-trees are not made by coach-builders, but by firms who make it their special business. They are of two kinds, the “mail,” which are secured to the wheel by three bolts passing through the nave, and the “collinge” (invented in 1792), the latter made secure by gun-metal cone-shaped collets and nuts. The axle boxes which are wedged into the nave are of three kinds, cast, chilled and wrought iron, in all cases case-hardened, the first being the cheapest and the last the most costly. Many attempts have been made to improve upon the collinge axle-tree, but none of them has got far beyond the experimental stage.

No branch of coach-building contributes more to the elegance of the vehicle than that of painting. To obtain the needful perfection the work has to pass through several stages before reaching the finishing colour, which must be of the finest quality. The varnish used is copal, of which there are two kinds, the one for finishing the body, the other the carriage. In first-class work as many as eighteen or twenty coats will be required to complete the various stages. After a carriage has been in use about twelve months, it is practicable to revive the brilliant gloss on the panels by hand-polishing with the aid of rottenstone and oil, a process which requires a specially trained man to do successfully.

The trimming of the interior of a carriage requires much skill and judgment on the part of the workmen in providing really comfortable, well-fitted seats and neatness of workmanship. In the middle of the 19th century figured tabaret or satin were much used, but for many years past morocco has been almost universally preferred. Silk lutestring spring curtains, Brussels or velvet pile carpet, complete the interior, unless are added neat morocco covered trays with mirror, &c., for ladies’ convenience. Electric light is now frequently used for the interior, and can be applied with much neatness and efficiency. Road lamps, door handles, polished silver or brass furniture, are supplied to the coach-builder by firms whose special business it is to make them. Lever brakes are now a very ordinary requirement. Much

judgment is needful to make them efficient, and careful workmanship to prevent rattle. Indiarubber is the best material for blocks applied to steel tires, and cast iron for indiarubber tires. The “Bowden wire” recently introduced is in some cases a convenient and light alternative to the long bar connecting the handle with the hind cross levers, and has the advantage of passing out of sight through the interior of the body.

(J. A. M‘N.)

CARRICKFERGUS, a seaport and watering-place of Co. Antrim, Ireland, in the east parliamentary division; on the northern shore of Belfast Lough, 9½ m. N.E. of Belfast by the Northern Counties (Midland) railway. Pop. of urban district (1901) 4208. It stretches for about 1 m. along the shore of the Lough. The principal building is the castle, originally built by John de Courci towards the close of the 12th century, and subsequently much enlarged. It stands on a projecting rock above the sea, and was formerly a place of much strength. It is still maintained as an arsenal, and mounted with heavy guns. The ancient donjon or keep, 90 ft. in height, is still in good preservation. The town walls, built by Sir Henry Sidney, are still visible on the west and north, and the North Gate remains. The parish church of St Nicholas, an antiquated cruciform structure with curious Elizabethan work in the north transept, and monuments of the Chichester family, was originally a chapel or oratory dependent on a Franciscan monastery. The entrance to a subterranean passage between the two establishments is still visible under the communion-table of the church. The gaol, built on the site of the monastery above mentioned, was formerly the county of Antrim prison. The court-house, which adjoins the gaol, is a modern building. The town has some trade in domestic produce, and in leather and linen manufactures, there being several flax spinning-mills and bleach-works in the immediate neighbourhood. Distilling is carried on. The harbour admits vessels of 500 tons. The fisheries are valuable, especially the oyster fisheries. At Duncrue about 2 m. from the town, rock salt of remarkable purity and in large quantity is found in the Triassic sandstone. The neighbouring country is generally hilly, and Slieve True (1100 ft.) commands a magnificent prospect.

In 1182, John de Courci, to whom Henry II. had granted all the parts of Ulster he could obtain possession of by the sword, fixed a colony in this district. The castle came in the 13th century into possession of the De Lacy family, who, being ejected, invited Edward Bruce to besiege it (1315). After a desperate resistance the garrison surrendered. In 1386, the town was burned by the Scots, and in 1400 was destroyed by the combined Scots and Irish. Subsequently, it suffered much by famine and the occasional assaults of the neighbouring Irish chieftains, whose favour the townsmen were at length forced to secure by the payment of an annual tribute. In the reign of Charles I. many Scottish Covenanters settled in the neighbourhood to avoid the persecution directed against them. In the civil wars, from 1641, 407
Carrickfergus was one of the chief places of refuge for the Protestants of the county of Antrim; and on the 10th of June 1642, the first Presbytery held in Ireland met here. In that year the garrison was commanded by General Robert Munro, who, having afterwards relinquished the cause of the English parliament, was surprised and taken prisoner by Sir Robert Adair in 1648. At a later period Carrickfergus was held by the partisans of James II., but surrendered in 1689 to the forces under King William’s general Schomberg; and in 1690 it was visited by King William, who landed here on his expedition to Ireland. In 1760 it was surprised by a French squadron under Commodore Thurot, who landed with about 1000 men, and, after holding the place for a few days, evacuated it on the approach of the English troops. Eighteen years later Paul Jones, in his ship the “Ranger,” succeeded in capturing the “Drake,” a British sloop-of war, in the neighbouring bay; but he left without molesting the town. In the reign of Queen Elizabeth the town obtained a charter, and this was confirmed by James I., who added the privilege of sending two burgesses to the Irish parliament. The corporation, however, was superseded, under the provisions of the Municipal Reform Act of 1840, by a board of municipal commissioners. Carrickfergus was a parliamentary borough until 1885; and a county of a town till 1898, having previously (till 1850) been the county town of county Antrim. But its importance was sapped by the vicinity of Belfast, and its historical associations are now its chief interest.

CARRICKMACROSS, a market town of Co. Monaghan, Ireland, in the south parliamentary division, 68 m. N.W. of Dublin on a branch of the Great Northern railway. Pop. of urban district (1901) 1874. It has a pleasant, elevated site, a considerable agricultural trade, and a famous manufacture of lace, which is carried on in various conventual establishments. There are some remains of an Elizabethan castle, a seat of the earls of Essex, which was destroyed during the wars of 1641; the ruins of the old church of St Finbar commemorate the same disastrous period.

CARRICK-ON-SHANNON, a market town and the county town of Co. Leitrim, Ireland, in the south parliamentary division, beautifully situated on the left bank of the upper Shannon, between Loughs Allen and Boderg, close to the confluence of the Boyle. Pop. (1901) 1118. It is on the Sligo branch of the Midland Great Western railway, 90 m. W.N.W. of Dublin, the station being across the river in county Roscommon. Though having so small a population it is the largest town in the county, is the seat of the assizes, and has quays and some river trade. The surrounding country, with its waterways, loughs and woods, is of considerable beauty.

CARRICK-ON-SUIR, a market town of Co. Tipperary, Ireland, in the east parliamentary division, on the north (left) bank of the Suir, 14¼ m. W.N.W. from Waterford by the Waterford & Limerick line of the Great Southern & Western railway. Pop. of urban district (1901) 5406. It was formerly a walled town, and contains some ancient buildings, such as the castle, erected in 1309, formerly a seat of the dukes of Ormonde, now belonging to the Butler family, a branch of which takes the title of earl from the town. On the other side of the river, connected by a bridge of the 14th century, and another of modern erection, stands the suburb of Carrickbeg, in county Waterford, where an abbey was founded in 1336. The woollen manufactures for which the town was formerly famous are extinct. A thriving export trade is carried on in agricultural produce, condensed milk is manufactured, and slate is extensively quarried in the neighbourhood, while some coal is exported from the neighbouring fields. Dredging has improved the navigable channel of the river, which is tidal to this point and is lined with quays.

CARRIER, JEAN BAPTISTE (1756-1794), French Revolutionist and Terrorist, was born at Yolet, a village near Aurillac in Upper Auvergne. In 1790 he was a country attorney (counsellor for the *bailliage* of Aurillac) and in 1792 he was chosen deputy to the National Convention. He was already known as one of the influential members of the Cordeliers club and of that of the Jacobins. After the subjugation of Flanders he was one of the commissioners nominated in the close of 1792 by the Convention, and sent into that country. In the following year he took part in establishing the Revolutionary Tribunal. He voted for the death of Louis XVI., was one of the first to call for the arrest of the duke of Orleans, and took a prominent part in the overthrow of the Girondists (on the 31st of May). After a mission into Normandy, Carrier was sent, early in October 1793, to Nantes, under orders from the Convention to suppress the revolt which was raging there, by the most severe measures. Nothing loth, he established a revolutionary tribunal, and formed a body of desperate men, called the Legion of Marat, for the purpose of destroying in the swiftest way the masses of prisoners heaped in the jails. The form of trial was soon discontinued, and the victims were sent to the guillotine or shot or cut down in the prisons *en masse*. He also had large numbers of prisoners put on board vessels with trap doors for bottoms, and sunk in the Loire. This atrocious process, known as the *Noyades* of Nantes, gained for Carrier a reputation for wanton cruelty. Since in his mission to Normandy he had been very moderate, it is possible that, as he was nervous and ill when sent to Nantes, his mind had become unbalanced by the

atrocities committed by the Vendean and royalist armies. Naturally, the stories told of him are not all true. He was recalled by the Committee of Public Safety on the 8th of February 1794, took part in the attack on Robespierre on the 9th Thermidor, but was himself brought before the Revolutionary Tribunal on the 11th and guillotined on the 16th of November 1794.

See Comte Fleury, *Carrier à Nantes*, 1793-1794 (Paris, 1897); Alfred Lallié, *J.B. Carrier, représentant du Cantal à la Convention 1756-1794 d'après de nouveaux documents* (Paris, 1901). These works, and the others of Lallié, are inspired by strong royalist sympathies and are not altogether to be accepted.

CARRIER, a general term for any person who conveys the goods of another for hire, more specifically applied to the tradesmen, now largely superseded by the railway system, who convey goods in carts or wagons on the public roads. In jurisprudence, however, the term is collectively applied to all conveyers of property, whether by land or water; and in this sense the changes and enlargements of the system of transit throughout the world have given additional importance to the subject. The law by which carriers, both by land and sea, are made responsible for the goods entrusted to them, is founded on the praetorian edict of the civil law, to which the ninth title of the fourth book of the Pandect is devoted. The edict itself is contained in these few words, "*nautae, caupones, stabularii, quod cujusque salvum fore receperint, nisi restituent, in eos judicium dabo.*" The simplicity of the rule so announced has had a most beneficial influence on the commerce of the world. Throughout the great civilized region which took its law directly from Rome, and through the other less civilized countries which followed the same commercial code, it laid a foundation for the principle that the carrier's engagement to the public is a contract of indemnity. It bound him in the general case, to deliver what he had been entrusted with, or its value,—thus sweeping away all secondary questions or discussions as to the conditions of mere or less culpability on his part under which loss or damage may have occurred; and it left any limitations of this general responsibility to be separately adjusted by special contract.

The law of England recognizes a distinction between a common and a private carrier. The former is one who holds himself out to the public as ready to carry for hire from place to place the goods of such persons as choose to employ him. The owner of a stagecoach, a railway company, the master of a general ship, a wharfinger carrying goods on his own lighters are common carriers; and it makes no difference that one of the *termini* of the journey is out of England. It has been held, however, that a person who carries only passengers is not a common carrier; nor of course is a person who merely engages to carry the goods of particular individuals or to carry goods upon any particular occasion. A common carrier is subject at law to peculiar liabilities. He is bound to carry the goods of any person who offers to pay his hire, unless there is a good reason to the contrary, as, for example, when his carriage is full, or the article is not such as he is in the habit of conveying. He ought to carry the goods in the usual course without unnecessary deviation or delay. To make him liable there must be a due delivery of the goods to him in the known course of his business. His charge must be reasonable; and he must not give undue preference to any customer or class of customers. The latter principle, as enforced by statute, has come to be of great importance in the law of railway companies. In respect of goods entrusted to him, the carrier's liability, unless limited by a special contract, is, as already stated, that of an insurer. There is no question of negligence as in the case of injury to passengers, for the warranty is simply to carry safely and securely. The law, however, excepts losses or injuries occasioned immediately "by the act of God or the king's enemies"—words which have long had a strict technical signification. It would appear that concealment without fraud, on the part of the customer, will relieve the carrier from his liability for *negligence*, but not for actual *misfeasance*. Fraud or deceit by the customer (*e.g.*, in misrepresenting the real value of the goods) will relieve the carrier from his liability. The responsibility of the carrier ceases only with the delivery of the goods to the proper consignee. By the Carriers' Act 1830 the liability of carriers for gold, silver, &c. (in general "articles of great value in small compass") is determined. Should the article or parcel exceed £10 in value, the carrier is not to be liable for loss unless such value is declared by the customer and the carrier's increased charge paid. Where the value is thus declared, the carrier may, by public notice, demand an increased charge, for which he must, if required, sign a receipt. Failing such receipt or notice, the carrier must refund the increased charge and remain liable as at common law. Except as above no mere notice or declaration shall affect a carrier's liability; but he may

make special contracts with his customers. The carriage of goods by sea is subject to special regulations (see AFFREIGHTMENT). The carriage of goods by railway and canal is subject to the law of common carrier, except where varied by particular statutes, as the Railway and Canal Traffic Acts 1854 to 1894 and the Regulation of Railways Acts 1840 to 1893. The effect of these acts is to prevent railway companies as common carriers from limiting by special contract their liability to receive, forward and deliver goods, unless the conditions embodied in the special contract are reasonable, and the contract is in writing and signed by, or on behalf of, the sender. A railway company must provide reasonable facilities for forwarding passengers' luggage; where luggage is taken into the carriage with a passenger, the company is responsible for it only in so far as loss or damage is due to the passenger's interference with the company's exclusive control of it. As carriers of passengers companies are bound, in the absence of any special contract, to exercise due care and diligence, and are responsible for personal injuries only when they have been occasioned by negligence or want of skill. Where there has been contributory negligence on the part of the passenger, *i.e.* where he might, by the exercise of ordinary care, have avoided the consequences of the defendants' negligence—he is not entitled to recover. By the act of 1846 (commonly called Lord Campbell's Act), when a person's death has been caused by such negligence as would have entitled him to an action had he survived, an action may be maintained against the party responsible for the negligence on behalf of the wife, husband, parent or child of the deceased. Previously such cases had been governed by the maxim *actio personalis moritur cum persona*.

CARRIÈRE, MORITZ (1817-1895), German philosopher and historian, was born at Griedel in Hesse Darmstadt on the 5th of March 1817. After studying at Giessen, Göttingen and Berlin, he spent a few years in Italy studying the fine arts, and established himself in 1842 at Giessen as a teacher of philosophy. In 1853 he was appointed professor at the university of Munich, where he lectured mainly on aesthetics. He died in Munich on the 19th of January 1895. An avowed enemy of Ultramontanism, he contributed in no small degree to making the idea of German unity more palatable to the South Germans. Carrière identified himself with the school of the younger Fichte as one who held the theistic view of the world which aimed at reconciling the contradictions between deism and pantheism. Although no obstinate adherent of antiquated forms and prejudices, he firmly upheld the fundamental truths of Christianity. His most important works are: *Aesthetik* (Leipzig, 1859; 3rd ed., 1885), supplemented by *Die Kunst im Zusammenhang der Kulturentwicklung und der Ideale der Menschheit* (3rd ed., 1877-1886); *Die philosophische Weltanschauung der Reformationszeit* (Stuttgart, 1847; 2nd ed., Leipzig, 1886), and *Die sittliche Weltordnung* (Leipzig, 1877; 2nd ed., 1891), in which he recognized both the immutability of the laws of nature and the freedom of the will. He described his view of the world and life as "real-idealism." His essay on Cromwell (in *Lebensskizzen*, 1890), which may be considered his political confession of faith, also deserves mention. His complete works were published at Leipzig, 14 vols., in 1886-1894.

See S.P.V. Lind in *Zeitschrift f. Philos.* (cvi, 1895, pp. 93-101); W. Christ in *Allgemeine deutsche Biographie* (1903).

CARRINGTON, CHARLES ROBERT WYNN-CARINGTON, 1ST EARL (1843-), English statesman, son of the 2nd Baron Carrington (d. 1868), was educated at Eton and Trinity, Cambridge, and sat in the House of Commons as a Liberal for High Wycombe from 1865 till he succeeded to the title in 1868. He was governor of New South Wales 1885-1890, lord chamberlain 1892-1895, and became president of the board of agriculture in 1905, having a seat in the cabinet in Sir H. Campbell-Bannerman's and Mr Asquith's ministries. He was created Earl Carrington and Viscount Wendover in 1895. The Carrington barony was conferred in 1796 on Robert Smith (1752-1838), M.P. for Nottingham, a member of a famous banking family, the title being suggested by one held from 1643 to 1706 in another family of Smith in no way connected. The 2nd baron married as his second wife one of the two

daughters of Lord Willoughby de Eresby, and their son, through her, became in 1879 joint hereditary lord great chamberlain of England. The 2nd Baron took the surname of Carrington, afterwards altered to Caington, instead of Smith.

CARRINGTON, RICHARD CHRISTOPHER (1826-1875), English astronomer, son of a brewer at Brentford, was born in London on the 26th of May 1826. Though intended for the Church, his studies and tastes inclined him to astronomy, and with a view to gaining experience in the routine of an observatory he accepted the post of observer in the university of Durham. Finding, however, that there was little chance of obtaining instruments suitable for the work which he wished to undertake, he resigned that appointment and established in 1853 an observatory of his own at Redhill. Here he devoted three years to a survey of the zone of the heavens within 9 degrees of the North Pole, the results of which are contained in his *Redhill Catalogue of 3735 Stars*. But his name is chiefly perpetuated through his investigation of the motions of sun-spots, by which he determined the elements of the sun's rotation and made the important discovery of a systematic drift of the photosphere, causing the rotation-periods of spots to lengthen with increase of solar latitude. He died on the 27th of November 1875.

For further information see *Month. Notices Roy. Astr. Society*, xiv. 13, xviii. 23, 109, xix. 140, 161, xxxvi. 137; *Memoirs Roy. Astr. Soc.*, xxvii. 139; *The Times*, Nov. 22 and Dec. 7, 1875; *Roy. Society's Cat. Scient. Papers*, vols. i. and vii.; Introductions to Works.

CARROCCIO; a war chariot drawn by oxen, used by the medieval republics of Italy. It was a rectangular platform on which the standard of the city and an altar were erected; priests held services on the altar before the battle, and the trumpeters beside them encouraged the fighters to the fray. In battle the carroccio was surrounded by the bravest warriors in the army and it served both as a rallying-point and as the palladium of the city's honour; its capture by the enemy was regarded as an irretrievable defeat and humiliation. It was first employed by the Milanese in 1038, and played a great part in the wars of the Lombard league against the emperor Frederick Barbarossa. It was afterwards adopted by other cities, and first appears on a Florentine battlefield in 1228. The Florentine carroccio was usually followed by a smaller car bearing the *martinella*, a bell to ring out military signals. When war was regarded as likely the *martinella* was attached to the door of the church of Santa Maria in the Mercato Nuovo in Florence and rung to warn both citizens and enemies. In times of peace the carroccio was in the keeping of some great family which had distinguished itself by signal services to the republic.

Accounts of the carroccio will be found in most histories of the Italian republics; see for instance, M. Villani's *Chronache*, vi. 5 (Florence, 1825-1826); P. Villari, *The Two First Centuries of Florentine History*, vol. i. (Engl. transl., London, 1894); Gino Capponi, *Storia della Repubblica di Firenze*, vol. i. (Florence, 1875).

CARRODUS, JOHN TIPLADY (1836-1895), English violinist, was born on the 20th of January 1836, at Keighley, in Yorkshire. He made his first appearance as a violinist at the age of nine, and had the advantage of studying between the ages of twelve and eighteen at Stuttgart, with Wilhelm Bernhard Molique. On his return to England in 1853 Costa got him engagements in the leading orchestras. He was a member of the Covent Garden opera orchestra from 1855, made his début as a solo player at a concert given on the 22nd of April 1863 by the Musical Society of London, and succeeded Sainton as leader at Covent Garden in 1869. He died at Hampstead on the 13th of July 1895. For many years he had led the Philharmonic orchestra and those of the great provincial festivals. He published two violin

solos and a "*Morceau de salon,*" and was a very successful teacher.

CARROLL, CHARLES (1737-1832), American political leader, of Irish ancestry, was born at Annapolis, Maryland, on the 19th of September 1737. He was educated abroad in French Jesuit colleges, studied law at Bourges, Paris and London, and in February 1765 returned to Maryland, where an estate known as "Carrollton," in Frederick county, was settled upon him; he always signed his name as "Charles Carroll of Carrollton." Before and during the War of Independence, he was a whig or patriot leader, and as such was naturally a member of the various local and provincial extra-legal bodies—committees of correspondence, committees of observation, council of safety, provincial convention (1774-1776) and constitutional convention (1776). From 1777 until 1800 he was a member of the Maryland senate. In April-June 1776 he, with Samuel Chase and Benjamin Franklin, was a member of the commission fruitlessly sent by the continental congress to Canada for the purpose of persuading the Canadians to join the thirteen revolting colonies. From 1776 to 1779 he sat in the continental congress, rendering important services as a member of the board of war, and signing on the 2nd of August 1776 the Declaration of Independence, though he had not been elected until the day on which that document was adopted. He out-lived all of the other signers. He was a member of the United States Senate from 1789 to 1792. From 1801 until his death, at Baltimore, on the 14th of November 1832, he lived in retirement, his last public act being the formal ceremony of starting the construction of the Baltimore and Ohio railway (July 4, 1828). In politics, after the formation of parties, he was a staunch Federalist. Of unusual ability, high character and great wealth, he exercised a powerful influence, particularly among his co-religionists of the Roman Catholic faith, and he used it to secure the independence of the colonies and to establish a stable central government.

See the *Life* by Kate Mason Rowland (1898).

CARROLL, JOHN (1735-1815), American Roman Catholic prelate, was born at Upper Marlborough, Prince George's county, Maryland, on the 8th of January 1735, the son of wealthy Catholic parents and a cousin of Charles Carroll "of Carrollton." He was educated at St Omer's in Flanders, becoming a novitiate in the Society of Jesus in 1753, and then at the Jesuit college in Liège, being ordained priest in 1769 and becoming professor of philosophy and theology. In 1771 he became a professed father of the Society of Jesus and professor at Bruges. As tutor to the son of Lord Stourton, he travelled through Europe in 1772-1773. After the papal brief of the 21st of July 1773 suppressed the Society of Jesus, he accompanied its English members then in Flanders to England. In 1774 he returned to America, and set to work at a mission at Rock Creek, Montgomery county, Maryland, where his mother lived. He shared the feeling for independence growing among the American colonists, foreseeing that it would mean greater religious freedom. In 1776, at the request of the continental congress, he accompanied Benjamin Franklin, Charles Carroll and Samuel Chase on their mission to secure the aid or neutrality of the French-Canadians, and though unsuccessful it gained for him the friendship of Franklin. In 1783 he took a prominent part in the petition to Rome to take the control of the American church away from London; and on Franklin's recommendation, Carroll was named prefect apostolic, the American church being recognized as a distinct body in a decree issued by Cardinal Antonelli on the 9th of June 1784. In the summer of 1785 he began his visitations; in 1786 he induced the general chapter to authorize a Catholic seminary (now Georgetown University); and at the same session it was voted that the condition of the church required a bishop, accountable directly to the pope (and not to the Congregation of the Propaganda) and chosen by the American clergy. Consent to this course was given by Antonelli in a letter of the 12th of July 1788. The clergy met at Whitemarsh, Maryland, and Baltimore was adopted as the episcopal seat, Carroll being chosen as bishop; and on the 6th of November 1789 Pius VI. issued a bull to that effect, Carroll being consecrated at Lulworth Castle, England, on the 15th of August 1790.

On his return from England the bishop saw Georgetown College completed (1791), thanks

to moneys he had received from English Catholics. His first synod met on the 7th of November 1791; and on the 16th he issued the “Circular on Christian Marriage,” which attacked marriage by any save “lawful pastors of our church.” In 1795 the Rev. Leonard Neale (1746-1817) was appointed his coadjutor. In 1799, after the death of Washington, Bishop Carroll bade his clergy hold the 22nd of February 1800 as a day of mourning, and on that day delivered in his pro-cathedral a memorial discourse which attracted much attention. Already in 1802 he was pressing for the creation of new sees in his diocese, and the Louisiana Purchase of 1803 gave added weight to this request; in September 1805 the Propaganda made him administrator apostolic of the diocese of New Orleans, to which he appointed John Olivier as vicar general; and in 1808 Pius VII. divided Carroll’s great diocese into four sees, Boston, New York, Philadelphia and Bardstown (Kentucky), suffragan to the metropolitanate of Baltimore, of which Carroll actually became archbishop by the assumption of the long delayed *pallium* on the 18th of August 1811, having consecrated three suffragans in the autumn of 1810. In 1811 ecclesiastical jurisdiction over the Danish and Dutch West Indies was bestowed upon him. Carroll was now an old man, and the shock of the war of 1812, which as a staunch Federalist he had opposed until its actual declaration, together with the action of the Holy See in appointing to the sees of Philadelphia and New York other candidates than those of his recommendation, weighed on his mind. He died in Georgetown on the 3rd of December 1815. He may well be reckoned the greatest figure in the Roman Catholic Church of the United States. His position in the church had never been easy, partly because he had been a prominent member of the Society of Jesus. The great size of his diocese had made it unwieldy; and his struggle to secure the independence of the American church had been a difficult one. As a defender of papal and episcopal authority he had, especially in Philadelphia and Baltimore, to deal with churches whose trustees insisted that they and their parishes alone could choose priests, that bishop or prefect could not object to their choice. Akin to this difficulty was the desire of Catholics of different nationalities to have separate churches, a desire often created or encouraged by intriguing and ambitious priests. Besides these and other internal annoyances, Carroll had to meet the deep-seated distrust of his church in communities settled almost exclusively by Protestants.

See John Gilmary Shea, *History of the Catholic Church in the United States*, vol. ii. (1763-1815), (Akron and New York, 1888); and Daniel Brent, *Biographical Sketch of the Most Rev. John Carroll, First Archbishop of Baltimore, with Select Portions of His Writings*, edited by John Carroll Brent (Baltimore, 1843).

CARRONADE, a piece of ordnance invented, by the application of an old principle of gun construction, to serve as a ship’s gun. The inventor was the antiquary General Robert Melville (1728-1809). He designed the piece in 1759, and called it the “smasher,” but it was not adopted in the British navy till 1779, and was then known as the “carronade,” from the Carron works on the Carron river in Stirlingshire, Scotland, where it was first cast by Mr Gascoigne. The carronade had a powder chamber like many of the earliest guns known, and was similar to a mortar. It was short, light, had a limited range, but was destructive at close quarters. Carronades were added to the existing armaments of guns proper or long guns. A 38-gun frigate carried ten carronades, and was therefore armed with 48 pieces of ordnance. As the official classifications were not changed, they were misleading guides to the real strength of British ships, which always carried more pieces than they were described as carrying. The same remark applies to French and American ships when the use of the carronade extended from the British to other navies.

CARROT. Wild carrot, *Daucus carota*, a member of the natural order Umbelliferae, grows wild in fields and on roadsides and sea-shores in Britain and the north temperate zone generally of the Old World. It is an annual and resembles the cultivated carrot, except in the root, which is thin and woody. It is the origin of the cultivated carrot, which can be developed from it in a few generations. M. Vilmorin succeeded in producing forms with thick fleshy roots and the biennial habit in four generations. In the cultivated carrot, during the first

season of growth, the stem remains short and bears a rosette of graceful, long-stalked, branched leaves with deeply cut divisions and small, narrow ultimate segments. During this period the plant devotes its energies to storing food, chiefly sugar, in the so-called root, which consists of the upper part of the true root and the short portion of the stem between the root and the lowest leaves. A transverse section of the root shows a central core, generally yellow in colour, and an outer red or scarlet rind. The core represents the wood of an ordinary stem and the outer ring the soft outer tissue (bast and cortex). In the second season the terminal bud in the centre of the leaf-rosette grows at the expense of the stored nourishment and lengthens to form a furrowed, rather rough, branched stem, 2 or 3 ft. high, and bearing the flowers in a compound umbel. The umbel is characterized by the fact that the small leaves (bracts) which surround it, resemble the foliage leaves on a much reduced scale, and ultimately curve inwards, the whole inflorescence forming a nest-like structure. The flowers are small, the outer white, the central ones often pink or purplish. The fruit consists of two one-seeded portions, each portion bearing four rows of stiff spinous projections, which cause the fruits when dropped to cling together, and in a natural condition help to spread the seed by clinging to the fur of animals. On account of these projections the seeds cannot be sown evenly without previous rubbing with sand or dry ashes to separate them. As usual in the members of the order Umbelliferae, the wall of the fruit is penetrated lengthwise by canals containing a characteristic oil.

Carrots vary considerably in the length, shape and colour of their roots, and in the proportion of rind to core. The White Belgian, which gives the largest crops, has a very thick root which is white, becoming pale green above, where it projects above ground. For nutritive purposes it is inferior to the red varieties. The carrot delights in a deep sandy soil, which should be well drained and deeply trenched. The ground should be prepared and manured in autumn or winter. For the long-rooted sorts the soil should be at least 3 ft. deep, but the Short Horn varieties may be grown in about 6 in. of good compost laid on the top of a less suitable soil. Peat earth may be usefully employed in lightening the soil. Good carrots of the larger sorts may be grown in unfavourable soils by making large holes 18 in. deep with a crowbar, and filling them up with sandy compost in which the seeds are to be sown. The main crop is sown at the end of March or beginning of April. After sowing, it is only necessary to thin the plants, and keep them clear of weeds. The roots are taken up in autumn and stored during winter in a cool shed or cellar.

CARRYING OVER, or CONTINUATION, a stock exchange term for the operation by which the settlement of a bargain transacted for money or for a given account, may for a consideration (called either a “contango” or a “backwardation”) be postponed from one settling day to another. Such a continuation is equivalent to a sale “for the day” and a repurchase for the succeeding account, or to a purchase “for the day” and a resale for the succeeding account. The price at which such transactions are adjusted is the “making-up” price of the day. (See ACCOUNT and STOCK EXCHANGE.)

CARSIOLI (mod. *Carsoli*), an ancient city of Italy, on the Via Valeria, 42 m. E. by N. of Rome. It was founded in the country of the Aequi between 302 and 298 B.C., just after the establishment of Alba Fucens, no doubt as a stronghold to guard the road to the latter. It is mentioned in 211 B.C. as one of the twelve out of thirty Latin colonies which protested their inability to furnish more men or money for the war against Hannibal. We find it used in 168 B.C. like Alba Fucens as a place of confinement for political prisoners. It was sacked in the Social War, but probably became a *municipium* after it, though we hear but little of it. The modern town of Carsoli first appears in a diploma of A.D. 866, but the old site does not seem to have been abandoned until the 13th century. It is now occupied only by vineyards, and lies about 2100 ft. above sea-level, in a plain surrounded by mountains, now called Piano del Cavaliere. The line of the city walls (originally in tufa, and reconstructed in limestone), built of rectangular blocks, can be traced, and so can the scanty remains of several buildings, including the *podium* or base, of a temple, and also the ancient branch road from the Via

Valeria (which itself keeps just south-east of Carsioli), traversing the site from north to south. The forty-third milestone of the Via Valeria still lies at or near its original site; it was set up by Nerva in A.D. 97. One mile to the north-west of Carsioli are the remains of an ancient aqueduct consisting of a buttressed wall of concrete crossing a valley.

See G.J. Pfeiffer and T. Ashby in *Supplementary Papers of the American School in Rome*, i. (1905), 108 seq.

(T. As.)

CARSON, CHRISTOPHER ["KIT"] (1809-1868), American hunter and scout, was born in Madison county, Kentucky, on the 24th of December 1809. When he was a year old his parents removed to Howard county, Missouri, then a frontier settlement, and the boy was early trained in the hardships and requirements of pioneer life. He served for a while as a saddler's apprentice, and after 1826 devoted himself to the life of a professional guide and hunter. He was hunter for the garrison at Bent's Fort on the Arkansas river in what is now Bent county, Colorado, from 1832 to 1840, and accompanied John C. Frémont on his exploring expeditions of 1842 and 1843-1844, and on his California expedition in 1845-1846. Carson took part in the Mexican War, and, after the rush to the Pacific Coast began, engaged as a guide to convoy emigrants and drovers across the plains and mountains. In 1854 he became Indian agent at Taos, New Mexico, in which position, through his knowledge of the Indian traits and language, he was able to exercise for many years a restraining influence over the warlike Apaches and other tribes. During the Civil War he rendered invaluable services to the Federal cause in the south-west as chief scout in charge of the various bodies of irregular scouts and rangers participating in the constant border warfare that characterized the conflict in that part of the Union. In March 1865 he was breveted brigadier-general of volunteers for gallantry in the battle of Valverde (on the 21st of February 1862) and for distinguished services in New Mexico, and after the war resumed his position as Indian agent, which he held until his death at Fort Lyon, Colorado, on the 23rd of May 1868. "Kit" Carson occupies in the latter period of American pioneer history a position somewhat similar to that held by Daniel Boone and David Crockett at an earlier period, as the typical frontier hero and Indian fighter, and his hairbreadth escapes and personal prowess are the subject of innumerable stories.

See Charles Burdett, *Life of Kit Carson, the Great Western Hunter and Guide* (New York, 1859; new ed., 1877); and De Witt C. Peters, *The Life and Adventures of Kit Carson, the Nestor of the Rocky Mountains, from Facts Narrated by Himself* (New York, 1858).

CARSON CITY, the capital of Nevada, U.S.A., and the county seat of Ormsby county, about 120 m. N.E. of Sacramento, California. Pop. (1890) 3950; (1900) 2100; (1910) 2466. It is served by the Virginia and Truckee railway, which has repair shops here, and by stage to Lake Tahoe, 12 m. W. of the city. It is picturesquely situated in Eagle valley, near the east base of the Sierra Nevada, at an elevation of 4720 ft. above the sea. Within 1 m. of the city are Shaws Hot Springs. The city is a distributing point for the neighbouring mining region. Among the public buildings are the capitol, the United States government building, a United States mint, and a state orphans' home; in the vicinity are the state prison and a United States government school for Indians. The industrial interests of the city are principally in mining, lumbering and agriculture. It has an excellent supply of mountain spring water. Carson City (named in honour of Christopher Carson) was settled in 1851 as a trading post, was laid out as a town in 1858, was made the capital of the state and the county seat of the newly erected county in 1861, and was chartered as a city in 1875.

CARSTARES (or CARSTAIRS), **WILLIAM** (1649-1715), Scottish clergyman, was born at Cathcart, near Glasgow, on the 11th of February 1649, the son of the Rev. John Carstares, a member of the extreme Covenanting party of Protestors. He was educated at the university of Edinburgh, and then passed over to Utrecht, where he commenced his lifelong friendship with the prince of Orange, and began to take an active part in the politics of his country. The government disliked Carstares for several reasons. He was the intimate of William; he had been the bearer of messages between the disaffected in Scotland and Holland; and he was believed to be concerned with Sir James Steuart (1635-1715) in the authorship of a pamphlet —*An Account of Scotland's Grievances by reason of the D. of Lauderdale's Ministrie, humbly tendered to his Sacred Majesty*. Accordingly, on his return to England, at the close of 1674, he was committed to the Tower; the following year he was transferred to Edinburgh Castle, and it was not till August 1679 that he was released. After this he visited Ireland, and then became pastor to a Nonconformist congregation at Cheshunt. During 1682 he was in Holland, but in the following year he was again in London, and was implicated in the Rye House Plot. On its discovery he was examined before the Scottish Council; though the torture of the thumb-screw was applied, he refused to utter a word till he was assured that his admissions would not be used in evidence, and in the disclosures he then made he displayed great discretion. On his return to Holland he was rewarded by William's still warmer friendship, and the post of court chaplain; and after the Revolution he continued to hold this office, under the title of royal chaplain for Scotland. He was the confidential adviser of the king, especially with regard to Scottish affairs, and rendered important service in promoting the Revolution Settlement. On the accession of Anne, Carstares retained his post as royal chaplain, but resided in Edinburgh, having been elected principal of the university. He was also minister of Greyfriars', and afterwards of St Giles', and was four times chosen moderator of the general assembly. He took an important part in promoting the Union, and was consulted by Harley and other leading Englishmen concerning it. During Anne's reign, the chief object of his policy was to frustrate the measures which were planned by Lord Oxford to strengthen the Episcopalian Jacobites—especially a bill for extending the privileges of the Episcopalians and the bill for replacing in the hands of the old patrons the right of patronage, which by the Revolution Settlement had been vested in the elders and the Protestant heritors. On the accession of George I., Carstares was appointed, with five others, to welcome the new dynasty in the name of the Scottish Church. He was received graciously, and the office of royal chaplain was again conferred upon him. A few months after he was struck with apoplexy, and died on the 28th of December 1715.

See *State-papers and Letters addressed to William Carstares*, to which is prefixed a Life by M'Cormick (1774); Story's *Character and Career of William Carstares* (1874); Andrew Lang's *History of Scotland* (1907).

CARSTENS, ARMUS JACOB (1754-1798), German painter, was born in Schleswig, and in 1776 went to Copenhagen to study. In 1783 he went to Italy, where he was much impressed by the work of Giulio Romano. He then settled in Lübeck as a portrait painter, but was helped to visit Rome again in 1792, and gradually produced some fine subject and historical paintings, *e.g.* "Plato's Symposium" and the "Battle of Rossbach"—which made him famous. He was appointed professor at Berlin, and in 1795 a great exhibition of his works was held in Rome, where he died in 1798. Carstens ranks as the founder of the later school of German historical painting.

CARSULAE, an ancient city of Umbria, on the Via Flaminia, 19 m. N. of Narnia (mod. *Narni*) and 24 m. S.S.W. of Mevania (mod. *Bevagna*). It is little mentioned in ancient literature. The town was a *municipium*. The Via Flaminia is well preserved and enters the north gate of the town, the archway of which still stands. Remains of buildings may also be seen upon the site, and the outline of an amphitheatre is visible. The town of Cesi, 3 m. to the south-east, has polygonal walls, and may perhaps be regarded as an Umbrian city which was destroyed by the Romans, Carsulae being constructed in its stead. The medieval city, as so

often happened in Italy, returned to the pre-Roman site.

See G. Gamurrini in *Notizie degli Scavi* (1884), 149; for the tombs, L. Lanzi, in *Notizie degli Scavi* (1902), 592.

CART (A.S. *crœt*, Gaelic *cairt*; connected with “car”), a general term for various kinds of vehicles (see Carriage), in some cases for carrying people, but more particularly for transporting goods, for agricultural or postal purposes, &c., or for carriers. Though constructed in various ways, the simplest type for goods is two-wheeled, topless and springless; but as a general term “cart” is used in combination with some more specific qualification (dog-cart, donkey-cart, road-cart, polo-cart, &c.), when it is employed for pleasure purposes. The “dog-cart,” so called because originally used to convey sporting dogs, is a more or less elevated two-wheeled carriage, generally with scats back to back, in front and behind; the “governess-cart” (presumably so called from its use for children), a very low two-wheeled pony-carriage, has two side seats facing inwards; the “tax-cart,” a light two-wheeled farmer’s cart, was so called because formerly exempted from taxation as under the value of £21.

CARTAGENA, or Carthagena, a city, seaport, and the capital of the department of Bolívar, Colombia, South America, on the Caribbean coast, in 10° 25′ 48″ N., 75° 34′ W. Pop. (1905, official estimate) 14,000. The population of Cartagena is largely composed of blacks and mixed races, which form the predominant type on the lowland plains of northern Colombia. The well-to-do whites of Cartagena usually have country houses on the Turbaco hills, where the temperature is much lower than on the coast. The mean annual temperature in the city is 82°, and the port is classed as very unhealthful, especially for unacclimatized foreigners. The harbour, which is the best on the north coast of South America, is formed by an indentation of the coast-line shut in by two long islands lying parallel to the mainland. It covers an area of about 62.5 sq. m. and affords deep and secure anchorages and ample facilities for loading and unloading large vessels. The city itself has no modern quays, and large vessels do not approach within a mile of its landing-stages, but the railway pier (lengthened 120 ft. in 1898) on the mainland opposite permits the mooring of vessels alongside. There were formerly two entrances to the harbour—the Boca Grande (large mouth) between the low sandy island or peninsula on which the city stands and the island of Tierra Bomba, and the Boca Chica (small mouth) at the south end of the latter island. The Boca Grande was filled with stone after the city had been captured three times, because of the ease with which an enemy’s ships could pass through it at any time, and the narrow and more easily defended Boca Chica, 7 m. farther south, has since been used.

The city occupies a part of the upper island or peninsula facing the northern end of the harbour, and is separated from the mainland on the east by a shallow lagoon-like extension of the bay which is bridged by a causeway passing through the extramural suburb of Xiximani on another island. The old city, about ¾ m. long, north and south, and ½ m. wide, is enclosed by a heavy wall, in places 40 ft. thick, and is defended by several formidable-looking forts, which have long been dismantled, but are still in a good state of preservation. At the mainland end of the causeway leading from the city is the fort of San Felipe, about 100 ft. above sea-level, adapted as a distributing reservoir in the city’s waterworks; and behind it are verdure-covered hills rising to an elevation of 500 ft., forming a picturesque background to the grey walls and red-tiled roofs of the city. The streets are narrow, irregular and roughly paved, but are lighted by electricity; tramway lines run between the principal points of the city and suburbs. The houses are built with thick walls of stone and brick round open courts, in the Moorish style, and their iron-barred doors and windows give them the appearance of being a part of the fortifications. Among the numerous churches, the largest and most imposing is the Jesuit church of San Juan de Dios, with its double towers and celebrated marble pulpit; an old monastery adjoins. Cartagena is an episcopal see, and its cathedral dates from colonial times. The city was once the headquarters of the Inquisition in South America, and the edifice which it occupied, now private property, is an object of much

interest. The water supply of the city was formerly obtained from rainwater tanks on the walls or by carriage from springs a few miles inland. But in 1906 an English company received a concession to bring water by pipes from springs on the Turbaco hills, 300 ft. above the sea.

The commercial importance of Cartagena declined greatly during the period of civil disorders which followed the war for independence, but in later years has revived. In the reign of Philip II. the Spaniards had opened a canal ("El Dique") through some marshes and lagoons into a small western outlet of the Magdalena, which gave access to that river at Calamar, about 81 m. above the bar at its mouth; during Cartagena's decline this was allowed to fill up; it was reopened in 1846 for a short time and then was obstructed again by river floods; but in 1881 it was reopened for steam navigation. Towards the end of the 19th century a railway, 65 m. long, was built between Cartagena and Calamar. Imports consist of cotton, linen and woollen fabrics, hardware, cutlery and machinery, kerosene, glass and earthenware; and the exports of cattle, sugar, tobacco, coffee, coco-nuts and fibre, dividivi and dye-woods, vegetable ivory, rubber, hides and skins, medicinal forest products, gold, silver and platinum. The aggregate value of the exports in 1906 was $3,788,094 U.S. gold.

Cartagena was founded in 1533 by Pedro de Heredia. In 1544 it was captured by pirates, who plundered the town; in 1585 by Sir Francis Drake, who exacted a large ransom; and in 1697 by the French, who obtained from it more than £1,000,000. In 1741 Admiral Vernon unsuccessfully besieged the town. It was taken by Bolívar in 1815, but was surrendered to the royalists in the same year. It was recaptured by the republicans on the 25th of September 1821, and thereafter remained in their possession. It figured prominently in the political agitations and revolutions which followed, and underwent a siege in the civil war of 1885. It was an important naval station under Spanish colonial rule, and is the principal naval station of Colombia.

CARTAGENA, or CARTHAGENA, a seaport of south-eastern Spain, in the province of Murcia; in 37° 36′ N. and 0° 58′ W., at the terminus of a branch railway from the city of Murcia, and on the Mediterranean Sea. Pop. (1900) 99,871. Cartagena is fortified, and possesses an arsenal and naval dockyards. Together with Ferrol and San Fernando near Cadiz, the other great naval stations of Spain, it is governed by an admiral with the title of captain-general. It has also an episcopal see.

The city stands on a hill separated by a little plain from the harbour; towards the north and east it communicates with a fertile valley; on the south and west it is hemmed in by high mountains. Its grey houses have a neglected, almost a dilapidated appearance, from the friable stone of which they are constructed; and there are no buildings of antiquarian interest or striking architectural beauty, except, perhaps, the ruined citadel and the remnants of the town walls. The wide streets are traversed by a system of tramways, which pass through modern suburbs to the mining district about two leagues inland, and on the west a canal enables small vessels to enter the town without using the port. The harbour, the largest in Spain after that of Vigo, and the finest on the east coast, is a spacious bay, deep, except near its centre, where there is a ledge of rock barely 5 ft. under water. It is dominated, on the seaward side, by four hills, and approached by a narrow entrance, with forts on either hand; a breakwater affords shelter on the east, and on the west is the Arsenal Basin, often regarded as the original harbour of the Carthaginians and Romans. The island called La Escombrera, the ancient *Scombraria* (*i.e.* "mackerel fishery"), 2½ m. south, protects Cartagena from the violence of wind and waves. The mines near the city are very productive, and thousands of men and beasts are employed in transporting lead, iron, copper, zinc and sulphur to the coast. The industrial and commercial progress of Cartagena was much hindered, during the first half of the 19th century, by the prevalence of epidemic diseases, the abandonment of the arsenal, and rivalry with the neighbouring port of Alicante. Its sanitary condition, though still defective, was improved by the drainage of the adjacent Almajar Marsh; and after 1870, when the population had dwindled to about 26,000, Cartagena advanced rapidly in size and wealth. The opening of the railway enabled it to compete successfully with Alicante, and revived the mining and metallurgical industries, while considerable sums were expended on bringing the coast and land defences up to date, and adding new quays, docks and other harbour works. As a naval station, Cartagena suffered severely in 1898 from the maritime disasters of the Spanish-American War; and its

commerce was much affected when, at the beginning of the same year, Porman, or Portman, a mining village on a well-sheltered bay about 11 m. east, was declared by royal order an independent port. Vessels go to Porman to land coke and coal, and to load iron ore and lead. From Cartagena the principal exports are metallic ores, esparto grass, wine, cereals and fruit. Esparto grass, which grows freely in the vicinity, is the *spartum*, or Spanish broom, which gave the town its Roman designation of *Carthago Spartaria*. It is still used locally for making shoes, ships' cables, mats and a kind of spun cloth. Timber is largely imported from the United States, Sweden and Russia; coal from Great Britain; dried codfish from Norway and Newfoundland. In 1904, exclusive of coasters and small craft trading with north-west Africa, 662 ships of 604,208 tons entered the port of Cartagena, 259 being British and 150 Spanish; while 90 vessels were accommodated at Porman.

Cartagena was founded about the year 243 B.C. by the Carthaginian Hasdrubal, and was called *Carthago Nova* or New Carthage, to distinguish it from the African city of Carthage. It was conveniently situated opposite to the Carthaginian territory in Africa, and was early noted for its harbour. Its silver and gold mines were the source of great wealth both to the Carthaginians and to the Romans. In 210 B.C. this important place, the headquarters and treasure city of the Punic army, was stormed and taken with great slaughter by P. Scipio. The city continued to flourish under the Romans, who made it a colony, with the name *Colonia Victrix Julia Nova Carthago*. In A.D. 425 it was pillaged and nearly destroyed by the Goths. Cartagena was a bishopric from about 400 to 1289, when the see was removed to Murcia. Under the Moors it became an independent principality, which was destroyed by Ferdinand II. of Castile in 1243, restored by the Moors, and finally conquered by James I. of Aragon in 1276. It was rebuilt by Philip II. of Spain (1527-1598) for the sake of its harbour. In 1585 it was sacked by an English fleet under Sir Francis Drake. In 1706, in the War of the Spanish Succession, it was occupied by Sir John Leake; and in the next year it was retaken by the duke of Berwick. On the 5th of November 1823 it capitulated to the French. In consequence of the insurrection in Spain, Cartagena was in 1844 again the scene of warfare. On the 23rd of August 1873 it was bombarded by the Spanish fleet under Admiral Lobos; on the 11th of October a battle took place off the town, between the ships of the government and the rebels, and on the 12th of January 1874 Cartagena was occupied by the government troops.

See *Biblioteca histórica de Cartagena*, by G. Vicent y Portillo (Madrid, 1889, &c.); *Fechos y fechas de Cartagena*, by I. Martinez Rito (Cartagena, 1894); and *Serie de los obispos de Cartagena*, by P. Diaz Casson (Madrid, 1895).

CARTAGO, the capital of the province of Cartago, in Costa Rica, Central America; 13 m. E.S.E. of San José by the trans-continental railway. Pop. (1900) 4536. Cartago is built 4930 ft. above sea-level, on the fertile and beautiful plateau of San José, and at the southern base of the volcano Irazú (11,200 ft.). Some of its older buildings, especially the churches, are of considerable interest; but all bear marks of the volcanic disturbances from which the town has suffered on many occasions—notably in 1723, when it was nearly overwhelmed by the bursting of the flooded crater of Irazú, and in 1841, when it was shattered by an earthquake. There are hot mineral springs much frequented by invalids at Bella Vista, a suburb connected with the town by a tramway 3 m. long. The local trade is chiefly in coffee of fine quality, which is readily cultivated in the rich volcanic soil of the neighbourhood. Cartago is said to have been in existence as early as 1522; it was probably named in 1563 by the Spaniard Vazquez de Coronado, to whom its foundation is often ascribed. Though several times plundered by buccaneers, it retained its importance as the capital of Costa Rica until 1823, when it is said by tradition to have contained 30,000 inhabitants. Its prosperity rapidly diminished after the transference of the seat of government to San José, in 1823, but somewhat revived with the development of railways after 1871.

CARTE, THOMAS (1686-1754), English historian, was born at Dusmoon, near Clifton. He was educated at Oxford, and was first brought into notice by his controversy with Dr Henry Chandler regarding the Irish massacre, in which he defended Charles I. His attachment to

the Stuarts also caused him to remain a non-juror, and on the discovery of the plot of Atterbury, whose secretary he was, he was forced to flee to France. There he collected materials for an English edition of De Thou and Rigault, which were purchased and published by Dr Mead. Being recalled to England through the influence of Queen Caroline, he published, in 1738, *A General Account of the Necessary Materials for a History of England*. The first volume of his *Central History of England*, which is only of value for its vast and careful collection of facts, was published in 1747. By the insertion in it of the statement that the king's evil had been cured by the Pretender, Carte forfeited the favour of most of his patrons. He, however, continued to publish; and the 2nd volume appeared in 1750, the 3rd in 1752, the 4th in 1755. He published also a *Life of James, duke of Ormond*, containing a collection of letters, &c. (3 vols., 1735-1736; new ed., in 6 vols., Oxford, 1851), and a *History of the Revolutions of Portugal*, with letters of Sir R. Southwell during his embassy there (London, 1740). His papers became the property of the university of Oxford, and were deposited in the Bodleian library.

CARTER, ELIZABETH (1717-1806), English poet and translator, daughter of the Rev. Nicholas Carter, was born at Deal, in Kent, on the 16th of December 1717. Dr Carter educated his children, boys and girls, alike; but Elizabeth's slowness tired his patience, and it was only by great perseverance that she conquered her natural incapacity for learning. She studied late at night and early in the morning, taking snuff and chewing green tea to keep herself awake; thus causing severe injury to her health. She learned Greek and Latin, and Dr Johnson said concerning a celebrated scholar that he "understood Greek better than any one whom he had ever known except Elizabeth Carter." She learned also Hebrew, French, German, Italian, Spanish, Portuguese, and lastly some Arabic. She studied astronomy, ancient geography, and ancient and modern history. Edward Cave was a friend of Dr Carter, and in 1734 some of Elizabeth's verses, signed "Eliza," appeared in the *Gentleman's Magazine*, to which she contributed for many years. In 1738 Cave published her *Poems upon Particular Occasions*; in 1739 she translated from the French an attack on Pope's *Essay on Man* by J.P. de Crousaz; and in the same year appeared her translation from the Italian of Algarotti's *Newtonianismo per le Dame*, under the title of *Sir Isaac Newton's Philosophy explained for the use of the Ladies, in six Dialogues on Light and Colour*. Her translation of Epictetus (1758) was undertaken in 1749 to please her friends, Thomas Secker (afterwards archbishop of Canterbury) and his niece, Catherine Talbot, to whom the translation was sent, sheet by sheet, as it was done. In 1762 Miss Carter printed a second collection of *Poems on Several Occasions*. Her letters to Miss Talbot contain an account of a tour on the continent undertaken in 1763 in company with Edward and Elizabeth Montagu and William Pulteney, 1st earl of Bath. Dr Carter, from 1762 to his death in 1774, lived with his daughter in a house at Deal, which she had purchased. An annuity was settled on her by Sir William Pulteney and his wife, who had inherited Lord Bath's fortune; and she had another annuity from Mrs Montagu. Among Miss Carter's friends and correspondents were Samuel Johnson, Bishop Butler, Richard Savage, Horace Walpole, Samuel Richardson, Edmund Burke, Hannah More, and Elizabeth Vesey, who was a leader of literary society. She died in Clarges Street, Piccadilly, on the 19th of February 1806.

Her *Memoirs* were published in 1807; her correspondence with Miss Talbot and Mrs Vesey in 1809; and her letters to Mrs Montagu in 1817. See also *A Woman of Wit and Wisdom* (1906), a biography by Alice C.C. Gaussen.

CARTERET, SIR GEORGE (c. 1610-1680), English politician, was born between 1609 and 1617 on the island of Jersey, where his family had long been prominent landholders. He was the son of Helier de Carteret of St Ouen, and in his youth was trained to follow the sea. In 1639 he became comptroller of the English navy. During the Civil War he was active in behalf of the king. In 1643 he succeeded by reversion from his uncle, Sir Philip Carteret, to the post of bailiff of Jersey, and in the same year was appointed by the king lieutenant-governor of the island. After subduing the Parliamentary party in the island, he was commissioned (1644) a

vice-admiral of Jersey and “the maritime parts adjacent,” and by virtue of that office he carried on from there an active privateering campaign in the Royalist cause. Parliament branded him as a pirate and excluded him specifically from future amnesty. His rule in Jersey was severe, but profitable to the island; he developed its resources and made it a refuge for Royalists, among whom in 1646 and again in 1649-1650 was Prince Charles, who created Carteret a knight and baronet. In 1650, in consideration of Carteret’s services, Charles granted to him “a certain island and adjacent islets near Virginia, in America,” which were to be called New Jersey; but no settlement upon this grant was made. In 1651 Carteret, after a seven weeks’ siege, was compelled to surrender Jersey to a Parliamentary force; he then joined the Royalist exiles in France, where for a time he held a command in the French navy. He returned to England at the Restoration, became a privy councillor, sat in parliament for Portsmouth, and also served as vice-chamberlain of the royal household, a position to which he had been appointed in 1647. From 1661 to 1667 he was treasurer of the navy. He rendered valuable service during the Dutch War, but his lax methods of keeping accounts led to his being censured by parliament. In 1667 he became a deputy treasurer of Ireland. He continued nevertheless in the royal favour, and subsequently was appointed one of the commissioners of the admiralty and a member of the board of trade and plantations. He belonged to that group of courtiers interested in the colonization of America, and was one of the eight to whom Charles II. granted the country of the Carolinas by the charters of 1663 and 1665. In 1664 James, duke of York, granted that part of his American territory between the Hudson and Delaware rivers to Sir George Carteret and John, Lord Berkeley, and in Carteret’s honour this tract received the name of New Jersey. Sir George’s relative, Philip Carteret (d. 1682), was sent over as governor in 1665, but was temporarily deposed in 1672 by the discontented colonists, who chose James Carteret (perhaps a natural son of Sir George) as “president.” Philip Carteret was restored to his office in 1674. In this year Lord Berkeley disposed of his share of the grant, which finally fell under the control of William Penn and his associates. With them Carteret agreed (1676) upon a boundary line which divided the colony into East and West Jersey. He died in January 1680, and two years later his heirs disposed of his New Jersey holdings to Penn and other Quakers.

CARTESIANISM,[1] the general name given to the philosophy developed principally in the works of Descartes, Malebranche and Spinoza. It is impossible to exhibit the full meaning of these authors except in connexion, for they are all ruled by one and the same thought in different stages of its evolution. It may be true that Malebranche and Spinoza were prepared, the former by the study of Augustine, the latter by the study of Jewish philosophy, to draw from Cartesian principles consequences which Descartes never anticipated. But the foreign light did not alter the picture on which it was cast, but only let it be seen more clearly. The consequences were legitimately drawn. It may be shown that they lay in the system from the first, and that they were evolved by nothing but its own immanent dialectic. At the same time it is not likely that they would ever have been brought into such clear consciousness, or expressed with such consistency, except by a philosopher whose circumstances and character had completely detached him from all the convictions and prejudices of the age. In Malebranche, Cartesianism found an interpreter whose meditative spirit was fostered by the cloister, but whose speculative boldness was restrained by the traditions of the Catholic church. In Spinoza it found one who was in spirit and position more completely isolated than any monk, who was removed from the influence of the religious as well as the secular world of his time, and who in his solitude seemed scarcely ever to hear any voice but the voice of philosophy. It is because Cartesianism found such a pure organ of expression that its development is, in some sense, complete and typical. Its principles have been carried to their ultimate result, and we have before us all the data necessary to determine their value.

The Philosophy of Descartes.—Descartes was, in the full sense of the word, a partaker of the modern spirit. He was equally moved by the tendencies that produced the Reformation, and the tendencies that produced the revival of letters and science. Like Erasmus and Bacon, he sought to escape from a transcendent and unreal philosophy of the other world, to the knowledge of man and the world he lives in. But like Luther, he found within human experience, among the matters nearest to man, the consciousness of God, and therefore his renunciation of scholasticism did not end either in materialism or in that absolute distinction between faith and reason which inevitably leads to the downfall of faith. What was peculiar to Descartes, however, was the speculative interest which made it impossible for him to rest in

mere experience, whether of things spiritual or of things secular, which made him search, both in our consciousness of God and our consciousness of the world, for the links by which they are bound to the consciousness of self. In both cases it is his aim to go back to the beginning, to retrace the unconscious process by which the world of experience was built up, to discover the hidden logic that connects the different parts of the structure of belief, to substitute a reasoned system, all whose elements are interdependent, for an unreasoned congeries of opinions. Hence his first step involves reflection, doubt and abstraction. Turning the eye of reason upon itself, he tries to measure the value of that collection of beliefs of which he finds himself possessed; and the first thing that reflection seems to discover is its accidental and unconnected character. It is a mass of incongruous materials, accumulated without system and untested. Its elements have been put together under all kinds of influences, without any conscious intellectual process, and therefore we can have no assurance of them. In order that we may have such assurance we must unweave the web of experience and thought which we have woven in our sleep, that we may begin again at the beginning and weave it over again with "clear and distinct" consciousness of what we are doing. *De omnibus dubitandum est.* We must free ourselves by one decisive effort from the weight of custom, prejudice and tradition with which our consciousness of the world has been overlaid, that in that consciousness in its simplest and most elementary form we may find the true beginning of knowledge. The method of doubt is at the same time a method of abstraction, by which Descartes rises above the thought of the particular objects of knowledge, in order that he may find the primary truth in which lies the very definition of knowledge, of the reason why anything can be said to be true. First disappears the whole mass of dogmas and opinions as to God and man which are confessedly received on mere authority. Then the supposed evidence of sense is rejected, for external reality is not immediately given in sensation. It is acknowledged by all that the senses often mislead us as to the nature of things without us, and perhaps they may also mislead us as to there being anything without us at all. Nay, by an effort, we can even carry doubt beyond this point; we can doubt even mathematical truth. When, indeed, we have our thoughts directed to the geometrical demonstration, when the steps of the process are immediately before our minds, we cannot but assent to the proposition that the angles of a triangle are equal to two right angles; but when we forget or turn away our thoughts from such demonstration, we can imagine that God or some powerful spirit is playing upon our minds to deceive them, also that even our most certain judgments may be illusory. In this naïve manner does Descartes express the idea that there are necessities of thought prior to, and presupposed in the truth of geometry. He is seeking to strip thought of all the "lendings" that seem to come to it from anything but itself, of all relation to being that can be supposed to be given to it from without, that he may discover the primary unity of thought and being on which all knowledge depends. And this he finds in pure self-consciousness. Whatever I abstract from, I cannot abstract from self, from the "I think" that, as Kant puts it, accompanies all our ideas; for it was in fact the very independence of this universal element on the particulars that made all our previous abstraction possible. Even doubt rests on certitude; alone with self I cannot get rid of this self. By an effort of thought I separate my thinking self from all that I think, but the thinking self remains, and in thinking I am. *Cogito, ergo sum*: "I think, therefore I am." The objective judgment of self-consciousness is bound up with or involved in the very faculty of judging, and therefore remains when we abstract from all other objective judgments. It is an assertion involved in the very process by which we dismiss all other assertions. Have we not then a right to regard it as a primitive unity of thought and being, in which is contained, or out of which may be developed, the very definition of truth?

Principle of doubt.

Certainty of the thinking self.

The sense in which Descartes understood his first principle becomes clearer when we look at his answers to the objections made against it. On the one hand it was challenged by those who asked, like Gassendi, why the argument should be based especially on thought, and why we might not say with as good a right, *ambulo, ergo sum*: "I walk, therefore I am." Descartes explains that it is only as referred to consciousness that walking is an evidence of my existence; but if I say, "I am conscious of walking, therefore I exist," this is equivalent to saying, "I think in one particular way, therefore I exist." But it is not thinking in a particular way, but thinking in general that is coextensive with my existence. I am not always conscious of walking or of any other special state or object, but I am always conscious, for except in consciousness there is no ego or self, and where there is consciousness there is always an ego. "Do I then always think, even in sleep?" asks the objector; and Descartes exposes himself to the criticisms of Locke, by maintaining that it is impossible that there should ever be an interval in the activity of consciousness, and by insisting that as man is essentially a thinking substance, the child thinks, or is self-conscious, even in its mother's womb. The difficulty disappears when we observe that the question as to the conditions under which self-

Difficulties of the "cogito, ergo sum."

consciousness is developed in the individual human subject does not affect the nature of self-consciousness in itself or in its relation to knowledge. The force of Descartes's argument really lies in this, that the world as an intelligible world exists only for a conscious self, and that therefore the unity of thought and being in self-consciousness is presupposed in all knowledge. Of this self it is true to say that it exists only as it thinks, and that it thinks always. *Cogito, ergo sum* is, as Descartes points out, not a syllogism, but the expression of an identity which is discerned by the simple intuition of the mind.[2] If it were otherwise, the major "*omne quod cogitat existit*" would require to have been known before the minor "*cogito*"; whereas on the contrary it is from the immediate consciousness of being as contained in self-consciousness that that major can alone be derived. Again, when Hobbes and others argued that thinking is or may be a property of a material substance, Descartes answers that the question whether the material and the thinking substance are one does not meet us at the outset, but can only be solved after we have considered what is involved in the conception of these different substances respectively.[3] In other words, to begin by treating thinking as a quality of a material substance, is to go outside of the intelligible world for an explanation of the intelligible world. It is to ask for something prior to that which is first in thought. If it be true that the consciousness of self is that from which we cannot abstract, that which is involved in the knowledge of anything, then to go beyond it and seek for a reason or explanation of it in anything else is to go beyond the beginning of knowledge; it is to ask for a knowledge before knowledge.

Descartes, however, is himself unfaithful to this point of view; for, strictly taken, it would involve the consequence, not only that there is nothing prior to the pure consciousness of self, but that there can be no object which is not in necessary relation to it. Hence there can be no absolute opposition between thought and anything else, no opposition which thought itself does not transcend. But Descartes commits the error of making thought the property of a substance, a *res cogitans*, which as such can immediately or directly apprehend nothing but thoughts or ideas; while, altogether outside of these thoughts and ideas, there is another substance characterized by the property of extension, and with which thought has nothing to do. Matter in space is thus changed, in Kantian language, into a "thing in itself," an object out of all relation to the subject; and on the other hand, mind seems to be shut up in the magic circle of its own ideas, without any capacity of breaking through the circle or apprehending any reality but itself. Between thought and being, in spite of their *subjective* unity in self-consciousness, a great gulf seems still to be fixed, which cannot be crossed unless thought should become extended, or matter think. But to Descartes the dualism is absolute, because it is a presupposition with which he starts. Mind cannot go out of itself, cannot deal with anything but thought, without ceasing to be mind; and matter must cease to be matter ere it can lose its absolute externality, its nature as having *partes extra partes*, and acquire the unity of mind. They are opposed as the divisible and the indivisible, and there is no possible existence of matter in thought except a representative existence. The ideal (or, as Descartes calls it, objective) existence of matter *in* thought and the real (or, as Descartes calls it, formal) existence of matter *out of* thought are absolutely different and independent things.

Proof of existence of God.

It was, however, impossible for Descartes to be content with a subjective idealism that confined all knowledge to the tautological expression of self-consciousness "I am I," "What I perceive I perceive." If the individual is to find in his self-consciousness the principle of all knowledge, there must be something in it which transcends the distinction of self and not self, which carries him beyond the limit of his own individuality. What then is the point where the subjective consciousness passes out into the objective, from which it seemed at first absolutely excluded? Descartes answers that it is through the connexion of the consciousness of self with the consciousness of God. It is because we find God in our minds that we find anything else. The proof of God's existence is therefore the hinge on which the whole Cartesian philosophy turns, and it is necessary to examine the nature of it somewhat closely.

Descartes, in the first place, tries to extract a criterion of truth out of the *cogito, ergo sum*. Why am I assured of my own existence? It is because the conception of existence is at once and immediately involved in the consciousness of self. I can logically distinguish the two elements, but I cannot separate them; whenever I clearly and distinctly conceive the one, I am forced to think the other along with it. But this gives me a rule for all judgments whatever, a principle which is related to the *cogito, ergo sum* as the formal to the material principle of knowledge. Whatever we cannot separate from the clear and distinct conception of anything, necessarily belongs to it in reality; and on the other hand, whatever we can separate from the clear and distinct conception of anything, does not necessarily belong to it in reality. Let us therefore set an object clearly before us, let us sever it in thought so far as is possible from all other objects, and we shall at once be able to determine what properties and relations are essential and what are not essential to it. And if we find empirically that any

object manifests a property or relation not involved in the clear and distinct conception of it, we can say with certainty that such property or relation does not belong to it except by arbitrary arrangement, or, in other words, by the external combination of things which in their own nature have no affinity or connexion.

Now, by the application of this principle, we might at once assure ourselves of many mathematical truths; but, as has been already shown, there is a point of view from which we may doubt even these, so long as the idea of a God that deceives us is not excluded. If it is not certain that there is a God that cannot lie, it is not certain that there is an objective matter in space to which mathematical truth applies. But the existence of God may be proved in two ways. In the first place, it may be proved through the principle of causality, which is a self-evident truth. We have in our mind many ideas, and according to the principle of causality, all these ideas must be derived from something that contains a "formal" reality which corresponds to their "objective" reality, *i.e.* which contains at least as much reality in its existence out of thought as they contain in their existence in thought. Now we might derive from ourselves not only the ideas of other minds like ourselves, but possibly also of material objects, since these are lower in the scale of existence than ourselves, and it is conceivable that the idea of them might be got by omitting some of the qualities which distinguish ourselves. But the idea of God, of a being who is eternal and immutable, all-powerful, all-wise, and all-good, cannot be derived from our own limited and imperfect existence. The origin, therefore, must be sought in a being who contains actually in himself all that is contained in our idea of him.

Descartes's metaphysics.

It was objected by some of the critics of Descartes that the idea of God as the infinite Being is merely negative, and that it is derived from the finite simply by abstracting from its conditions. Descartes answers that the case is just the reverse—the infinite is the positive idea, and the finite is the negative, and therefore the former is the presupposition of the latter. As Kant, at a later date, pointed out that space is not a general conception, abstracted from the ideas of particular spaces, and representing the common element in them, but that, on the contrary, the ideas of particular spaces are got by the limitation of the one infinite space that is prior to them, so Descartes maintains in general that the idea of the finite is had only by limitation of the infinite, and not the idea of the infinite by abstraction from the particular determinations of the finite. It is a necessary consequence of this that the self-consciousness of a finite being is bound up with the consciousness of the infinite. Hence the idea of God is not merely one among other ideas which we have, but it is the one idea that is necessary to our very existence as thinking beings, the idea through which alone we can think ourselves, or anything else. "I ought never to suppose," says Descartes, "that my conception of the infinite is a negative idea, got by negation of the finite, just as I conceive repose to be merely negation of movement, and darkness merely the negation of light. On the contrary, I see manifestly that there is more reality in the infinite than in the finite substance, and that therefore I have in me the notion of the infinite, *even in some sense prior to the notion of the finite*, or, in other words, that the notion of myself in some sense presupposes the notion of God; for how could I doubt or desire, how could I be conscious of anything as a want, how could I know that I am not altogether perfect, if I had not in me the idea of a being more perfect than myself, by comparison with whom I recognize the defects of my own existence?"[4] Descartes then goes on in various ways to illustrate the thesis that the consciousness of a defective and growing nature cannot give rise to the idea of infinite perfection, but on the contrary presupposes it. We could not think of a series of approximations unless there were somehow present to us the idea of the completed infinite as the goal we aim at. If we had not the consciousness of ourselves as finite *in relation* to the infinite, either we should not be conscious of ourselves at all, or we should be conscious of ourselves as infinite. The image of God is so impressed by him upon us, that we "conceive that resemblance wherein the idea of God is contained by the same faculty whereby we are conscious of ourselves." In other words, our consciousness of ourselves is at the same time consciousness of our finitude, and hence of our relation to a being who is infinite.

The principle which underlies the reasoning of Descartes is that to be conscious of a limit, is to transcend it. We could not feel the limits either upon our thought or upon our existence, we could not doubt or desire, if we did not already apprehend something beyond these limits. Nay, we could not be conscious of our existence as individual selves if we were not conscious of that which is not ourselves, and of a unity in which both self and not-self are included. Our individual life is therefore to us as self-conscious beings a part of a wider universal life. Doubt and aspiration are but the manifestation of this essential division and contradiction of a nature which, as conscious of itself, is at the same time conscious of the whole in which it is a part. And as the existence of a self and its consciousness are one, so we may say that a thinking being is not only an individual, but always in some sense identified with that universal unity of being to which it is essentially related.

If Descartes had followed out this line of thought, he would have been led at once to the pantheism of Spinoza, if not beyond it. As it is, he is on the verge of contradiction with himself when he speaks of the consciousness of God as *in some sense* prior to the consciousness of self. How can anything be prior to the first principle of knowledge? It is no answer to say that the consciousness of God is the *principium essendi*, while the consciousness of self is the *principium cognoscendi*. For, if the idea of God is prior to the idea of self, knowledge must begin where existence begins, with God. The words "in some sense," with which Descartes qualifies his assertion of the priority of the idea of God, only betray his hesitation and his partial consciousness of the contradiction in which he is involved. Some of Descartes's critics presented this difficulty to him in another form, and accused him of reasoning in a circle when he said that it is because God cannot lie that we are certain that our clear and distinct ideas do not deceive us. The very existence of the conscious self, the *cogito, ergo sum*, which is the first of all truths and therefore prior in certitude to the existence of God, is believed only because of the clearness and distinctness with which we apprehend it. How then, they argued, could God's truthfulness be our security for a principle which we must use in order to prove the being of God? The answer of Descartes is somewhat lame. We cannot doubt any self-evident principle, or even any truth based on a self-evident principle, when we are directly contemplating it in all the necessity of its evidence; it is only when we forget or turn away from this evidence, and begin to think of the possibility of a deceitful God, that a doubt arises which cannot be removed except by the conviction that God is true.[5] It can scarcely be said that this is a *dignus vindice nodus*, or that God can fitly appear as a kind of second-best resource to the forgetful spirit that has lost its direct hold on truth and its faith in itself. God, truth, and the human spirit are thus conceived as having merely external and accidental relations with each other. What Descartes, however, is really expressing in this exoteric way is simply that beneath and beyond all particular truths lies the great general truth of the unity of thought and existence. In contemplating particular truth, we may not consciously relate it to this unity, but when we have to defend ourselves against scepticism we are forced to realize this relation. The ultimate answer to any attack upon a special aspect or element of truth must be to show that the fate of truth itself, the very possibility of knowledge, is involved in the rejection of it, and that we cannot doubt it without doubting reason itself. But to doubt reason is, in the language of Descartes, to doubt the truthfulness of God, for, in his view, the idea of God is involved in the very constitution of reason. Taken in this way then, the import of Descartes's answer is, that the consciousness of self, like every other particular truth, is not at first seen to rest on the consciousness of God, but that when we realize what it means we see that it does so rest. But if this be so, then in making the consciousness of self his first principle of knowledge, Descartes has stopped short of the truth. It can only be the first principle if it is understood, not as the consciousness of the individual self, but in a sense in which the consciousness of self is identical with the consciousness of God.

Descartes, however, is far from a clear apprehension of the ultimate unity of thought and being, which nevertheless he strives to find in God. Beginning with an absolute separation of the *res cogitans* from the *res extensa*, he is continually falling back into dualism just when he seemed to have escaped from it. Even in God the absolute unity, idea and reality fall asunder; our idea of God is not God in us, it is only an idea of which God's existence is the cause. But the category of causality, if it forms a bridge between different things, as here between knowing and being, at the same time repels them from each other. It is a category of external relation which may be adequate to express the relation of the finite to the finite, but not the relation of the finite to the infinite. We cannot conceive God as the cause of our idea of him, without making God a purely objective and therefore finite existence. Nor is the case better when we turn to the so-called ontological argument,—that existence is necessarily involved in the idea of God, just as the property of having its angles equal to two right angles is involved in the idea of a triangle. If indeed we understood this as meaning that thought transcends the distinction between itself and existence, and that therefore existence cannot be a thing in itself out of thought, but must be an intelligible world that exists as such only for the thinking being, there is some force in the argument. But this meaning we cannot find in Descartes, or to find it we must make him inconsistent with himself. He was so far from having quelled the phantom "thing in itself," that he treated matter in space as such a thing, and thus confused externality of space with externality to the mind. On this dualistic basis, the ontological argument becomes a manifest paralogism, and lies open to all the objections that Kant brought against it. That the idea of God involves existence, proves only that God, if he exists at all, exists by the necessity of his being. But the link that shall bind thought to existence is still wanting, and, in consistency with the other presuppositions of Descartes, it cannot be supplied.

But again, even if we allow to Descartes that God is the unity of thought and being, we must still ask what kind of unity? Is it a mere generic unity, reached by abstraction, and therefore leaving out all the distinguishing characteristics of the particulars under it? Or is it a concrete unity to which the particular elements are subordinated, but in which they are

nevertheless included? To answer this question, we need only look at the relation of the finite to the infinite, as it is expressed in that passage already quoted, and in many others. Descartes always speaks of the infinite as a purely affirmative or positive existence, and of the finite in so far as it is distinguished from the infinite, as purely negative, or in other words as a nonentity. "I am," he says, "a mean between God and nothing, between the Supreme Being and not-being. In so far as I am created by God, there is nothing in me that can deceive me or lead me into error. But on the other hand, if I consider myself as participating in nothingness or not-being, inasmuch as I am not myself the Supreme Being, but in many ways defective, I find myself exposed to an infinity of errors. Thus error as such is not something real that depends on God, but simply a defect; I do not need to explain it by means of any special faculty bestowed on me by God, but merely by the fact that the faculty for discerning truth from error with which he has endowed me, is not infinite."[6] But if we follow out this principle to its logical result, we must say not only that error is a consequence of finitude, but also that the very *existence* of the finite as such is an error or illusion. All finitude, all determination, according to the well-known Spinozistic aphorism, is negation, and negation cannot constitute reality. To know the reality of things, therefore, we have to abstract from their limits, or in other words, the only reality is the infinite. Finite being, *qua* finite, has no existence, and finite self-consciousness, consciousness of a self in opposition to or limited by a not-self, is an illusion. But Descartes does not thus reason. He does not see "anything in the nature of the infinite which should exclude the existence of finite things." "What," he asks, "would become of the power of that imaginary infinite if it could create nothing? Perceiving in ourselves the power of thinking, we can easily conceive that there should be a greater intelligence elsewhere. And even if we should suppose that intelligence increased *ad infinitum*, we need not fear that our own would be lessened. And the same is true of all other attributes which we ascribe to God, even of his power, provided only that we do not suppose that the power in us is not subjected to God's will. In all points, therefore, he is infinite without any exclusion of created things."[7] The truth of this view we need not dispute; the question is as to its consistency with Cartesian principles. It may be a higher idea of God to conceive him as revealing himself in and to finite creatures; but it is a different idea from that which is implied in Descartes's explanations of error. It is an inconsistency that brings Descartes nearer to Christianity, and nearer, it may also be said, to a true metaphysic; but it is not the less an inconsistency with his fundamental principles, which necessarily disappears in their subsequent development. To conceive the finite as constituted not merely by the absence of some of the positive elements of the infinite, but as in necessary unity with the infinite; to conceive the infinite as not merely that which has no limits or determinations, but as that which is self-determined and self-manifesting, which through all finitude and manifestation returns upon itself, may not be erroneous. But it would not be difficult to show that the adoption of such a conception involves the rejection or modification of almost every doctrine of the Cartesian system.

Mind and matter.

In connexion with this inconsistency we may notice the very different relations in which Descartes conceives mind on the one side and matter on the other, to stand towards God, who yet is the cause of both, and must therefore, by the principle of causality, contain in himself all that is in both. Matter and mind are to Descartes absolute opposites. Whatever can be asserted of mind can be denied of matter, whatever can be asserted of matter can be denied of mind. Matter is passive, mind is active; matter is extended, and therefore divisible *ad infinitum*; mind is an indivisible unity. In fact, though of this Descartes is not conscious, the 417
determination of the one is mediated by its opposition to the other; the ideas of object and subject, the self and not-self, are terms of a relation distinguishable but inseparable. But in the idea of God we must find a unity which transcends this difference in one way or another, whether by combining the two under a higher notion, or, as it would be more natural to expect on Cartesian principles, by abstracting equally from the particular characteristics of both. Descartes really does neither, or rather he acts partly on the one principle and partly on the other. In his idea of God he abstracts from the properties of matter but not from those of mind. "God," he says, "contains in himself *formaliter* all that is in mind, but only *eminenter* all that is in matter";[8] or, as he elsewhere expresses it more popularly, he *is* mind, but he is only the creator of matter. And for this he gives as his reason, that matter as being divisible and passive is essentially imperfect. *Ipsa natura corporis multas imperfectiones involvit*, and, therefore, "there is more analogy between sounds and colours than there is between material things and God." But the real imperfection here lies in the abstractness of the Cartesian conception of matter as merely extended, merely passive; and this is balanced by the equal abstractness of the conception of mind or self-consciousness as an absolutely simple activity, a pure intelligence without any object but itself. If matter as absolutely opposed to mind is imperfect, mind as absolutely opposed to matter is equally imperfect. In fact they are the elements or factors of a unity, and lose all meaning when severed from each other, and if we are to seek this unity by abstraction, we must equally abstract from both.

The result of this one-sidedness is seen in the fact that Descartes, who begins by separating

mind from matter, ends by finding the essence of mind in pure will, *i.e.* in pure formal self-determination. Hence God's will is conceived as absolutely arbitrary, not determined by any end or law, for all laws, even the necessary truths that constitute reason, spring from God's determination, and do not precede it. "He is the author of the essence of things no less than their existence," and his will has no reason but his will. In man there is an intelligence with eternal laws or truths involved in its structure, which so far limits his will. "He finds the nature of good and truth already determined by God, and his will cannot be moved by anything else." His highest freedom consists in having his will determined by a clear perception of the nature of good and truth, and "he is never indifferent except when he is ignorant of it, or at least does not see it so clearly as to be lifted above the possibility of doubt."[9] Indifference of will is to him "the lowest grade of liberty," yet, on the other hand, in nothing does the image of God in him show itself more clearly than in the fact that his will is not limited by his clear and distinct knowledge, but is "in a manner infinite." For "there is no object of any will, even the infinite will of God, to which our will does not extend."[10] Belief is a free act, for as we can yield our assent to the obscure conceptions presented by sense and the imagination, and thus allow ourselves to be led into error, so on the other hand we can refuse to give this assent, or allow ourselves to be determined by anything but the clear and distinct ideas of intelligence. That which makes it possible for us to err is that also in which the divine image in us is most clearly seen. We cannot have the freedom of God whose will creates the object of his knowledge; but in reserving our assent for the clear and distinct perceptions of intelligence, we, as it were, re-enact for ourselves the divine law, and repeat, so far as is possible to finite beings, the transcendent act of will in which truth and good had their origin.

Reason and will.

The inherent defect of this view is the divorce it makes between the form and the matter of intelligence. It implies that reason or self-consciousness is one thing, and that truth is another and quite different thing, which has been united to it by the arbitrary will of God. The same external conception of the relation of truth to the mind is involved in the doctrine of innate ideas. It is true that Descartes did not hold that doctrine in the coarse form in which it was attributed to him by Locke, but expressly declares that he has "never said or thought at any time that the mind required innate ideas which were separated from the faculty of thinking. He had simply used the word innate to distinguish those ideas which are derived from that faculty, and not from external objects or the determination of the will. Just as when we say generosity is innate in certain families, and in certain others diseases, like the gout or the stone, we do not mean to imply that infants in their mother's womb are affected with these complaints."[11] Yet Descartes, as we have seen, does not hold that these truths are involved in the very nature of intelligence as such, so that we cannot conceive a self-conscious being without them. On the contrary, we are to regard the divine intelligence as by arbitrary act determining that two and two should be four, or that envy should be a vice. We are "*not* to conceive eternal truth flowing from God as rays from the sun."[12] In other words, we are not to conceive all particular truths as different aspects of one truth. It is part of the imperfection of man's finite nature that he "finds truth and good determined for him." It is something given,—given, indeed, along with his very faculty of thinking, but still *given* as an external limit to it. It belongs not to his nature as spirit, but to his finitude as man.

After what has been said, it is obvious that the transition from God to matter must be somewhat arbitrary and external. God's truthfulness is pledged for the reality of that of which we have *clear and distinct ideas*; and we have clear and distinct ideas of the external world so long as we conceive it simply as extended matter, infinitely divisible, and moved entirely from without,—so long, in short, as we conceive it as the direct opposite of mind, and do not attribute to it any one of the properties of mind. "Omnes proprietates, quas in ea clare percipimus, ad hoc unum reducuntur, quod sit partibilis et mobilis, secundum partes." We must, therefore, free ourselves from the obscure and confused modes of thought which arise whenever we attribute any of the secondary qualities, which exist merely in our sensations, to the objects that cause these sensations. The subjective character of such qualities is proved by the constant change which takes place in them, without any change of the object in which they are perceived. A piece of wax cannot lose its extension; but its colour, its hardness, and all the other qualities whereby it is presented to sense, may be easily altered. What is objective in all this is merely an extended substance, and the modes of motion or rest through which it is made to pass. In like manner we must separate from our notion of matter all ideas of *actio in distans—e.g.* we must explain weight not as a tendency to the centre of the earth or an attraction of distant particles of matter, but as a consequence of the pressure of other bodies, immediately surrounding that which is felt to be heavy.[13] For the only conceivable *actio in distans* is that which is mediated by thought, and it is only in so far as we suppose matter to have in it a principle of activity like thought, that we can accept such explanations of its motion. Again, while we must thus keep our conception of matter clear of all elements that do not belong to it, we must also be careful not to take away from it those that *do* belong to it. It is a defect of distinctness in our ideas when we conceive an attribute as existing apart

Truth of external world.

from its substance, or a substance without its attribute; for this is to treat elements that are only separated by a "distinction of reason," as if they were distinct things. The conception of the possibility of a vacuum or empty space arises merely from our confusing the possible separation of any mode or form of matter from matter in general with the impossible separation of matter in general from its own essential attribute. Accordingly, in his physical philosophy, Descartes attempts to explain everything on mechanical principles, starting with the hypothesis that a certain quantity of motion has been impressed on the material universe by God at the first, a quantity which can never be lost or diminished, and that space is an absolute plenum in which motion propagates itself in circles.

Material universe a mechanism.

It is unnecessary to follow Descartes into the detail of the theory of vortices. It is more to the purpose to notice the nature of the reasons by which he is driven to regard such a mechanical explanation of the universe as necessary. A real or substantive existence is, in his view, a *res completa*, a thing that can be conceived as a whole in itself without relations to any other thing. Now matter and mind are, he thinks, such complete existences, so long as we conceive them, as pure intelligence must conceive them, as abstract opposites of each other; and do not permit ourselves to be confused by those mixed modes of thought which are due to sense or imagination. Descartes does not see that in this very abstract opposition there is a bond of union between mind and matter, that they are correlative opposites, and therefore in their separation *res incompletae*. In other words, they are merely elements of reality substantiated by abstract thought into independent realities. He indeed partly retracts his assertion that mind and matter severed from each other are *res completae*, when he declares that neither can be conceived as existing apart from God, and that therefore, strictly speaking, God alone is a substance. But, as we have seen, he avoids the necessary inference that in God the opposition between mind and matter is reconciled or transcended, by conceiving God as abstract self-consciousness or will, and the material world not as his necessary manifestation, but simply as his creation,—as having its origin in an act of bare volition and that only. His God is the God of monotheism and not of Christianity, and therefore the world is to God always a foreign matter which he brings into being, and acts on from without, but in which he is not revealed.

Animals automata.

It is a natural consequence of this view that nature is essentially *dead matter*, that beyond the motion it has received from God at the beginning, and which it transmits from part to part without increase or diminution, it has no principle of activity in it. Every trace of vitality in it must be explained away as a mere false reflection upon it of the nature of mind. The world is thus "cut in two with a hatchet," and there is no attraction to overcome the mutual repulsion of its severed parts. Nothing can be admitted in the material half that savours of self-determination, all its energy must be communicated, not self-originated; there is no room for gravitation, still less for magnetism or chemical affinity, in this theory. *A fortiori*, animal life must be completely explained away. The machine may be very complicated, but it is still, and 418
can be nothing but, a machine. If we once admitted that matter could be anything but mechanical, we should be on the way to admit that matter could become mind. When a modern physical philosopher declares that everything, even life and thought, is ultimately reducible to matter, we cannot always be certain that he means what he seems to say. Not seldom the materialist *soi-disant*, when we hear his account of the properties of matter, turns out to be something like a spiritualist in disguise; but when Descartes asserted that everything *but* mind is material, and that the animals are automata, there is no such dubiety of interpretation. He said what he meant, and meant what he said, in the hardest sense his words can bear. *His* matter was not even gravitating, much less living; it had no property except that of retaining and transmitting the motion received from without by pressure and impact. And *his* animals were automata, not merely in the sense of being governed by sensation and instinct, but precisely in the sense that a watch is an automaton. Henry More cries out against the ruthless consequence with which he develops his principles to this result. "In this," he says, "I do not so much admire the penetrative power of your genius as I tremble for the fate of the animals. What I recognize in you is not only subtlety of thought, but a hard and remorseless logic with which you arm yourself as with a sword of steel, to take away life and sensation with one blow, from almost the whole animal kingdom." But Descartes was not the man to be turned from the legitimate result of his principles by a scream. "Nec moror astutias et sagacitates canum et vulpium, nec quaecunque alia propter cibum, venerem, aut metum a brutis fiunt. *Profiteor enim me posse perfacile illa omnia ut a sola membrorum conformatione profecta explicare.*"[14]

Nature of sensation.

The difficulty reaches its height when Descartes attempts to explain the union of the body and spirit in man. Between two substances which, when clearly and distinctly conceived, do not imply each other, there can be none but an artificial unity,—a unity of composition that still leaves them external to each other. Even God cannot make them one in any higher sense.[15] And as it is impossible in the nature

of mind to see any reason why it should be embodied, or in the nature of matter to see any reason why it should become the organ of mind, the union of the two must be taken as a mere empirical fact. When we put on the one side all that belongs to intelligence, and on the other all that belongs to matter, there is a residuum in our ideas which we cannot reduce to either head. This residuum consists of our appetites, our passions, and our sensations, including not only the feelings of pain and pleasure, but also the perceptions of colour, smell, taste, of hardness and softness, and all the other qualities apprehended by touch. These must be referred to the union of mind with body. They are subjective in the sense that they give us no information as to the nature either of things or of mind. Their function is only to indicate what things are useful or hurtful to our composite nature as such, or in other words what things tend to confirm or dissolve the unity of mind and body. They indicate that *something* is taking place in our body, or without it, and so stimulate us to some kind of action, but *what* it is that is taking place they do not tell us. There is no resemblance in the sensation of pain produced by great heat to the rending of the fibres of our body that causes it. But we do not need to know the real origin of our sensation to prevent us going too near the fire. Sensation leads us into error only when we are not conscious that its office is merely practical, and when we attempt to make objective judgments by means of its obscure and confused ideas, *e.g.* when we say that there is heat in our hands or in the fire. And the remedy for this error is to be found simply in the clear conviction of the subjectivity of sensation.

These views of the nature of sense, however, at once force us to ask how Descartes can consistently admit that a subjective result such as sensation, a result in mind, should be produced by matter, and on the other hand how an objective result, a result in matter, should be effected by mind. Descartes explains at great length, according to his modification of the physiology of the day, that the pineal gland, which is the immediate organ of the soul, is acted on by the nerves through the “animal spirits,” and again by reaction upon these spirits produces motions in the body. It is an obvious remark that this explanation either materializes mind, or else puts for the solution the very problem to be solved. It was therefore in the spirit of Descartes, it was only making explicit what is involved in many of his expressions, when Geulincx, one of his earliest followers, formulated the theory of occasional causes. The general approval of the Cartesian school proved that this was a legitimate development of doctrine. Yet it tore away the last veil from the absolute dualism of the system, which had so far stretched the antagonism of mind and matter that no mediation remained possible, or what is the same thing, remained possible only through an inexplicable will of God. The intrusion of such a *Deus ex machina* into philosophy only showed that philosophy by its violent abstraction had destroyed the unity of the known and intelligible world, and was, therefore, forced to seek that unity in the region of the unknown and unintelligible. If our light be darkness, then in our darkness we must seek for light; if reason be contradictory in itself, truth must be found in unreason. The development of the Cartesian school was soon to show what is the necessary and inevitable end of such worship of the unknown.

Theory of occasional causes.

To the ethical aspect of his philosophy, Descartes, unlike Spinoza, only devoted a subordinate attention. In a short treatise, however, he discussed the relation of reason to the passions. After we have got over the initial difficulty, that matter should give rise to effects in mind, and mind in matter, and have admitted that in man the unity of mind and body turns what in the animals is mere mechanical reception of stimulus from without and reaction upon it into an action and reaction mediated by sensation, emotion and passion, another question presents itself. How can the mere natural movement of passion, the nature of which is fixed by the original constitution of our body, and of the things that act upon it, be altered or modified by pure reason? For while it is obvious that morality consists in the determination of reason by itself, it is not easy to conceive how the same being who is determined by passion from without should also be determined by reason from within. How, in other words, can a spiritual being maintain its character as self-determined, or at least determined only by the clear and distinct ideas of the reason which are its innate forms, in the presence of this foreign element of passion that seems to make it the slave of external impressions? Is reason able to crush this intruder, or to turn it into a servant? Can the passions be annihilated, or can they be spiritualized? Descartes could not properly adopt either alternative; he could not adopt the ethics of asceticism, for the union of body and mind is, in his view, natural; and hence the passions which are the results of that union are in themselves good. They are provisions of nature for the protection of the unity of soul and body, and stimulate us to the acts necessary for that purpose. Yet, on the other hand, he could not admit that these passions are capable of being completely spiritualized; for so long as the unity of body and soul is regarded as merely external and accidental, it is impossible to think that the passions which arise out of this unity can be transformed into the embodiment and expression of reason.

Ethics.

Descartes, indeed, points out that every passion has a lower and a higher form, and while

in its lower or primary form it is based on the obscure ideas produced by the motion of the animal spirits, in its higher form it is connected with the clear and distinct judgments of reason regarding good and evil. If, however, the unity of soul and body be a unity of composition, there is an element of obscurity in the judgments of passion which cannot be made clear, an element in desire that cannot be spiritualized. If the mind be external to the passions it can only impose upon them an external rule of moderation. On such a theory no *ideal* morality is possible to man in his present state; for, in order to the attainment of such an ideal morality, it would be necessary that the accidental element obtruded into his life as a spiritual being by his connexion with the body should be expelled. What can be attained under present conditions is only to abstract so far as is possible from external things, and those relations to external things into which passion brings us. Hence the great importance which Descartes attaches to the distinction between things in our power and things not in our power. What is not in our power includes all outward things, and therefore it is our highest wisdom to regard them as determined by an absolute fate, or the eternal decree of God. We cease to wish for the impossible; and therefore to subdue our passions we only need to convince ourselves that no effort of ours can enable us to secure their objects. On the other hand, that which is within our power, and which, therefore, we cannot desire too earnestly, is virtue. But virtue in this abstraction from all objects of desire is simply the harmony of reason with itself, the ἀταραξία of the Stoic under a slight change of aspect. Thus in ethics, as in metaphysics, Descartes ends not with a reconciliation of the opposed elements, but with a dualism, or at best, with a unity which is the result of abstraction.

The Philosophy of Malebranche.—Malebranche was prepared, by the ascetic training of the cloister and the teaching of Augustine, to bring to clear consciousness and expression many of the tendencies that were latent and undeveloped in the philosophy of Descartes. To use a chemical metaphor, the Christian Platonism of the church father was a medium in which Cartesianism could precipitate the product of its elements. Yet the medium was, as we shall see, not a perfect one, and hence the product was not quite pure. Without metaphor, Malebranche, by his previous habits of thought, was well fitted to detect and develop the pantheistic and ascetic elements of his master's philosophy. But he was not well fitted to penetrate through the veil of popular language under which the discordance of that philosophy with orthodox Christianity was hidden. On the contrary, the whole training of the Catholic priest, and especially his practical spirit, with that tendency to compromise which a practical spirit always brings with it, enabled him to conceal from himself as well as from others the logical result of his principles. And we do not wonder even when we find him 419
treating as a "miserable" the philosopher who tore away the veil.

Malebranche saw "*all things in God.*" In other words, he taught that knowledge is possible only in so far as thought is the expression, not of the nature of the individual subject as such, but of a universal life in which he and all other rational beings partake. "No one can feel my individual pain; every one can see the truth which I contemplate—why is it so? The reason is that my pain is a modification of my substance, but truth is the common good of all spirits."[16] This idea is ever present to Malebranche, and is repeated by him in an endless variety of forms of expression. Thus, like Descartes, but with more decision, he tells us that the idea of the infinite is prior to the idea of the finite. "We conceive of the infinite being by the very fact that we conceive of being without thinking whether it be finite or no. But in order that we may think of a finite being, we must necessarily cut off or deduct something from the general notion of being, which consequently we must previously possess. Thus the mind does not apprehend anything whatever, except in and through the idea that it has of the infinite; and so far is it from being the case that this idea is formed by the confused assemblage of all the ideas of particular things as the philosophers maintain, that, on the contrary, all these particular ideas are only participations in the general idea of the infinite, just as God does not derive his being from the creatures, but all the creatures are imperfect participations of the divine Being."[17] Again, he tells us, in the same chapter, that "when we wish to think of any particular thing, we first cast our view upon all being, and then apply it to the consideration of the object in question. We could not desire to see any particular object unless we saw it already in a confused and general way, and as there is nothing which we cannot desire to see, so all objects must be in a manner present to our spirit." Or, as he puts it in another place, "our mind would not be capable of representing to itself the general ideas of genera and species if it did not see all things as contained in one; for every creature being an individual we cannot say that we are apprehending any created thing when we think the general idea of a triangle."

Relation of

The main idea that is expressed in all these different ways is simply this, that to determine any individual object as such, we must relate it to, and distinguish it from, the whole of which it is a part; and that, therefore, thought could never apprehend anything if it did not bring with itself the idea of the intelligible world as a unity.

the Divine mind to human knowledge.

Descartes had already expressed this truth in his *Meditations*, but he had deprived it of its full significance by making a distinction between the being and the idea of God, the former of which, in his view, was only the cause of the latter. Malebranche detects this error, and denies that there is any idea of the infinite, which is a somewhat crude way of saying that there is no division between the idea of the infinite and its reality. What Reid asserted of the external world, that it is not represented by an idea in our minds, but is actually present to them, Malebranche asserted of God. No individual thing, he tells us—and an idea is but an individual thing—could represent the infinite. On the contrary, all individual things are represented through the infinite Being, who contains them all in his substance "très efficace, et par conséquence très intelligible."[18] We know God by himself, material things only by their ideas in God, for they are "unintelligible in themselves, and we can see them only in the being who contains them in an intelligible manner." And thus, unless we in some way "saw God, we should be able to see nothing else." The vision *of* God or *in* God, therefore, is an "intellectual intuition" in which seer and seen, knower and known, are one. Our knowledge of things is our participation in God's knowledge of them.

When we have gone so far with Malebranche, we are tempted to ask why he does not follow out his thought to its natural conclusion. If the idea of God is not separable from his existence, if it is through the idea of him that all things are known, and through his existence that all things are, then it would seem necessarily to follow that our consciousness of God is but a part of God's consciousness of himself, that our consciousness of self and other things is but God's consciousness of them, and lastly, that there is no existence either of ourselves or other things except in this consciousness. To understand Malebranche is mainly to understand how he stopped short of results that seemed to lie so directly in the line of his thought.

To begin with the last point, it is easy to see that Malebranche only asserts unity of idea and reality in God, to deny it everywhere else, which with him is equivalent to asserting it in general and denying it in particular. To him, as to Descartes, the opposition between mind and matter is absolute. Material things cannot come into our minds nor can our minds go out of themselves "pour se promener dans les cieux."[19] Hence they are in themselves absolutely unknown; they are known only in God, in whom are their ideas, and as these ideas again are quite distinct from the reality, they "might be presented to the mind without anything existing." That they exist *out* of God in another manner than the intelligible manner of their existence *in* God, is explained by a mere act of His will, that is, it is not explained at all. Though we see all things in God, therefore, there is no connexion between his existence and theirs. The "world is not a necessary emanation of divinity; God is perfectly self-sufficient, and the idea of the infinitely perfect Being can be conceived quite apart from any other. The existence of the creatures is due to the free decrees of God."[20] Malebranche, therefore, still treats of external things as "things in themselves," which have an existence apart from thought, even the divine thought, though it is only in and through the divine thought they can be known by us. "To see the material world, or rather to judge that it exists (since in itself it is invisible), it is necessary that God should reveal it to us, for we cannot see the result of his arbitrary will through necessary reason."[21]

But if we know external things only through their idea in God, how do we know ourselves? Is it also through the idea of us in God? Here we come upon a point in which Malebranche diverges very far from his master. We do not, he says, properly *know* ourselves at all as we know God or even external objects. We are conscious of ourselves by inner sense (*sentiment interieur*), and from this we know *that* we are, but we do not know *what* we are. "We know the existence of our soul more distinctly than of our body, but we have not so perfect a knowledge of our soul as of our body." This is shown by the fact that from our idea of body as extended substance, we can at once see what are its possible modifications. In other words, we only need the idea of extended substance to see that there is an inexhaustible number of figures and motions of which it is capable. The whole of geometry is but a development of what is given already in the conception of extension. But it is not so with our consciousness of self, which does not enable us to say prior to actual experience what sensations or passions are possible to us. We only know what heat, cold, light, colour, hunger, anger and desire are by feeling them. Our knowledge extends as far as our experience and no further. Nay, we have good reason to believe that many of these modifications exist in our soul only by reason of its accidental association with a body, and that if it were freed from that body it would be capable of far other and higher experiences. "We know by feeling that our soul is great, but perhaps we know almost nothing of what it is in itself." The informations of sense have, as Descartes taught, only a practical but no theoretical value; they tell us nothing of the external world, the real nature of which We know not through touch and taste and sight, but only through our idea of extended substances; while of the nature of the soul they do not tell us much more than that it exists and that it is not material. And in this latter case we have no idea, nothing better than sense to raise us above its illusions. It is clear from these

statements that by self-consciousness Malebranche means consciousness of desires and feelings, which belong to the individual as such, and not consciousness of self as thinking. He begins, in fact, where Descartes ended, and identifies the consciousness of self as thinking, and so transcending the limits of its own particular being, with the consciousness or idea of God. And between the consciousness of the finite in sense and the consciousness of the infinite in thought, or in other words, between the consciousness of the universal and the consciousness of the individual, he sees no connexion. Malebranche is just one step from the pantheistic conclusion that the consciousness of finite individuality as such is illusory, and that as all bodies are but modes of one infinite extension, so all souls are but modes of one infinite thought. But while he willingly accepts this result in regard to matter, his religious feelings prevent him from accepting it in relation to mind. He is driven, therefore, to the inconsistency of holding that sense and feeling, through which in his view we apprehend the finite as such, give us true though imperfect knowledge of the soul, while the knowledge they give us of body is not only imperfect but false.[22] Thus the finite spirit is still allowed to be a substance, distinct from the infinite, though it holds its substantial existence on a precarious tenure. It is left hanging, we may say, on the verge of the infinite, whose attraction must soon prove too strong for it. Ideas are living things, and often remould the minds that admit them in spite of the greatest resistance of dead custom and traditionary belief. In the grasp of a logic that overpowers him the more easily in that he is unconscious of its tendency. Malebranche is brought within one step of the pantheistic conclusion, and all his Christian feeling and priestly training can do is *just* to save him from denial of the personality of man.

But even this denial is not the last word of pantheism. When the principle that the finite is known only in relation to the infinite, the individual only in relation to the universal, is interpreted as meaning that the infinite and universal is complete in itself without the finite and individual, when the finite and individual is treated as a mere accidental existence due to the "arbitrary will of God," it ceases to be possible to conceive even God as a spirit. Did Malebranche realize what he was saying when he declared that God was "being in general," but not any particular being? At any rate we can see that the same logic that leads him almost to deny the reality of finite beings, leads him also to seek the divine nature in something more abstract and general even than thought. If we must abstract from all relation to the finite in order to know God as he is, is it not necessary for us also to abstract from self-consciousness, for self-consciousness has a negative element in it that is something definite, and therefore limited? We do not wonder, therefore, when we find Malebranche saying that reason does not tell us that God is a spirit, but only that he is an infinitely perfect being, and that he must be conceived rather as a spirit than as a body simply because spirit is more perfect than body. "When we call God a spirit, it is not so much to show positively what he is, as to signify that he is not material." But as we ought not to give him a bodily form like man's, so we ought not to think of his spirit as similar to our own spirits, although we can conceive nothing more perfect. "It is necessary rather to believe that as he contains in himself the properties of matter without being material, so he comprehends in himself the perfections of created spirits without being a spirit as we alone can conceive spirits, and that his true name is 'He who is,' *i.e.* Being without restriction, Being infinite and universal."[23] Thus the essentially self-revealing God of Christianity gives way to pure spirit, and pure spirit in its turn to the eternal and incomprehensible substance of which we can say nothing but that it is. The divine substance contains in it, indeed, everything that is in creation, but it contains them *eminenter* in some incomprehensible form that is reconcilable with its infinitude. But we have no adequate name by which to call it except Being. The curious metaphysic of theology by which, in his later writings, Malebranche tried to make room for the incarnation by supposing that the finite creation, which *as* finite is unworthy of God, was made worthy by union with Christ, the divine Word, shows that Malebranche had some indistinct sense of the necessity of reconciling his philosophy with his theology; but it shows also the necessarily artificial nature of the combination. The result of the union of such incongruous elements was something which the theologians at once recognised as heterodox and the philosophers as illogical.

There was another doctrine of Malebranche which brought him into trouble with the theologians, and which was the main subject of his long controversy with Arnauld. This was his denial of particular providence. As Leibnitz maintained that this is the best of all possible worlds, and that its evils are to be explained by the negative nature of the finite, so Malebranche, with a slight change of expression derived evil from the nature of particular or individual existence. It is not conformable to the nature of God to act by any but universal laws, and these universal laws necessarily involve particular evil consequences, though their ultimate result is the highest possible good. The question why there should be any particular existence, any existence but God, seeing such existence necessarily involves evil, remains insoluble so long as the purely pantheistic view of God is maintained; and it is this view which is really at the bottom of the assertion that he can have no particular volitions. To the coarse and anthropomorphic conception of particular providence Malebranche may be right in objecting, but on the other hand, it cannot be doubted that any theory in which the universal

is absolutely opposed to the particular, the infinite to the finite, is unchristian as well as unphilosophical. For under this dualistic presupposition, there seem to be only two possible alternatives open to thought: either the particular and finite must be treated as something independent of the universal and infinite, which involves an obvious contradiction, or else it must be regarded as absolute nonentity. We find Malebranche doing the one or the other as occasion requires. Thus he vindicates the freedom of man's will on the ground that the universal will of God does not completely determine the particular volitions of man; and then becoming conscious of the difficulty involved in this conception, he tries, like Descartes, to explain the particular will as something merely negative, a defect, and not a positive existence.

Reason and will.

But to understand fully Malebranche's view of freedom and the ethical system connected with it, we must notice an important alteration which he makes in the Cartesian theory of the relation of will and intelligence. To Descartes, as we have seen, the ultimate essence of mind lay in pure abstract self-determination or will, and hence he based even moral and intellectual truth on the arbitrary decrees of God. With Malebranche, on the other hand, abstraction goes a step further; and the absolute is sought not in the subject as opposed to the object, not in pure formal self-determination as opposed to that which is determined, but in a unity that transcends this difference. With him, therefore, will ceases to be regarded as the essence of intelligence, and sinks into a property or separable attribute of it. As we can conceive an extended substance without actual movement, so, he says, we can conceive a thinking substance without actual volition. But "matter or extension without motion would be entirely useless and incapable of that variety of forms for which it is made; and we cannot, therefore, suppose, that an all-wise Being would create it in this way. In like manner, if a spiritual or thinking substance were without will, it is clear that it would be quite useless, for it would not be attracted towards the objects of its perception, and would not love the good for which it is made. We cannot therefore conceive an intelligent being so to fashion it."[24] Now God need not be conceived as creating at all, for he is self-sufficient; but if he be a creator of spirits, he must create them for himself. "God cannot will that there should exist a spirit that does not love him, or that loves him less than any other good."[25] The craving for good in general, for an absolute satisfaction, is a *natural* love of God that is common to all. "The just, the wicked, the blessed, and the damned all alike love God with this love." Out of this love of God arises the love we have to ourselves and to others, which are the *natural inclinations* that belong to all created spirits. For these inclinations are but the elements of the love which is in God, and which therefore he inspires in all his creatures. "Il s'aime, il nous aime, il aime toutes ses créatures; il ne fait donc point d'esprits qu'il ne les porte à l'aimer, à s'aimer, et à aimer toutes les créatures."[26] Stripping this thought of its theological vesture, what is expressed here is simply that as a spiritual being each man is conscious of his own limited and individual existence, as well as of the limited and individual existence of other beings like himself, only in relation to the whole in which they are parts, so he can find his own good only in the good of the whole, and he is in contradiction with himself so long as he rests in any good short of that. His love of happiness, his natural inclinations both selfish and social, may be therefore regarded as an undeveloped form of the love of God; and the ideal state of his inclinations is that in which the love of self and of others are explicitly referred to that higher affection, or in which his love does not proceed from a part to the whole, but from the whole to the parts.

Ethics.

The question of morals to Malebranche is the question how these *natural inclinations* are related to the particular passions. Sensation and passion arise out of the connexion of body and soul, and their use is only to urge us to attend to the wants of the former. We can scarcely hear without a smile the simple monastic legend which Malebranche weaves together about the original nature of the passions and their alteration by the Fall. "It is visibly a disorder that a spirit capable of knowing and loving God should be obliged to occupy itself with the needs of the body." "A being altogether occupied with what passes in his body and with the infinity of objects that surround it cannot be thinking on the things that are truly good."[27] Hence the necessity of an immediate and instinctive warning from the senses in regard to the relations of things to our organism, and also of pains and pleasures which may induce us to attend to this warning. "Sensible pleasure is the mark that nature has attached to the use of certain things in order that without having the trouble of examining them by reason, we may employ them for the preservation of the body, but not in order that we may love them."[28] Till the Fall the mind was merely united to the body, not subjected to it, and the influence of these pleasures and pains was only such as to make men attend to their bodily wants, but not to occupy the mind, or fill it with sensuous joys and sorrows, or trouble its contemplation of that which is really good. Our moral aim should therefore be to restore this state of things, to weaken our union with the body and strengthen our union with God. And to encourage us in pursuing this aim we have to remember that union with God is natural to the spirit, and that, while even the condition of union with the body is artificial, the condition of subjection to the body is wholly

unnatural to it. Our primary tendency is towards the supreme good, and we only love the objects of our passions in so far as we "determine towards particular, and therefore false goods, the love that God gives us for himself." The search for happiness is really the search for God in disguise, and even the levity and inconstancy with which men rush from one finite good to another, is a proof that they were made for the infinite. Furthermore, this natural love of God, or inclination for good in general, "gives us the power of suspending our consent in regard to those particular goods which do not satisfy it."[29] If we refuse to be led by the obscure and confused voice of instinctive feeling, which arises from and always tends to confirm our union with the body, and wait for the light of reason which arises from and always tends to confirm our union with God, we have done all that is in our power, the rest is God's work. "If we only judge precisely of that which we see clearly, we shall never be deceived. For then it will not be we that judge, but the universal reason that judges in us."[30] And as our love, even of particular goods, is a confused love of the supreme good, so the clear vision of God inevitably brings with it the love of him. "We needs must love the highest when we see it." When it is the divine reason that speaks in us it is the divine love that moves us, "the same love wherewith God loves himself and the things he has made."[31]

The general result of the ethics of Malebranche is ascetic. The passions, like the senses, have no relation to the higher life of the soul; their value is only in relation to the union of soul and body, a union which is purely accidental or due to the arbitrary will of God. The more silently they discharge their provisional function, and the less they disturb or interfere with the pure activity of spirit, the more nearly they approach to the only perfection that is possible for them. Their ideal state is to remain or become again simple instincts that act mechanically like the circulation of the blood. Universal light of reason casts no ray into the obscurity of sense; its universal love cannot embrace any of the objects of particular passion. It is indeed recognized by Malebranche that sensation in man is mixed with thought, that the passions in him are forms of the love of good in general. But this union of the rational with the sensuous nature is regarded merely as a confusion which is to be cleared up, *not* in a higher unity of the two elements, but simply by the withdrawal of the spirit from contact with that which darkens and defiles it. Of a transformation of sense into thought, of passion into duty—an elevation of the life of sense till it becomes the embodiment and expression of the life of reason—Malebranche has no conception. Hence the life of reason turns with him to mysticism in theory and to asceticism in practice. His universal is abstract and opposed to the particular; instead of explaining it, it explains it away.

A certain tender beauty as of twilight is spread over the world as we view it through the eyes of this cloistered philosopher, and we do not at first see that the softness and ideality of the picture is due to the gathering darkness. Abstraction seems only to be purifying, and not destroying, till it has done its perfect work. Malebranche conceived himself to be presenting to the world only the purest and most refined expression of Christian ethics and theology. But if we obey his own continual advice to think clearly and distinctly, if we divest his system of all the sensuous and imaginative forms in which he has clothed it, and reduce it to the naked simplicity of its central thought, what we find is not a God that reveals himself in the finite, and to the finite, but the absolute substance which has no revelation, and whose existence is the negation of all but itself. Thus to tear away the veil, however, there was needed a stronger, simpler, and freer spirit—a spirit less influenced by opinion, less inclined to practical compromise, and gifted with a stronger "faith in the whispers of the lonely muse" of speculation than Malebranche.

The Philosophy of Spinoza.—It is a remark of Hegel's that Spinoza, as a Jew, first brought into European thought the idea of an absolute unity in which the difference of finite and infinite is lost. Some later writers have gone further, and attempted to show that the main doctrines by which his philosophy is distinguished from that of Descartes were due to the direct influences of Jewish writers like Maimonides, Gersonides, and Hasdai Crescas, rather than to the necessary development of Cartesian ideas. And it is undoubtedly true that many points of similarity with such writers, reaching down even to verbal coincidence, may be detected in the works of Spinoza, although it is not so easy to determine how much he owed to their teaching. His own view of his obligations is sufficiently indicated by the fact, that while in his ethics he carries on a continual polemic against Descartes, and strives at every point to show that his own doctrines are legitimately derived from Cartesian principles, he only once refers to Jewish philosophy as containing an obscure and unreasoned anticipation of these doctrines. "Quod quidam Hebraeorum quasi per nebulam vidisse videntur qui scilicet statuunt Deum Dei intellectum resque ab ipso intellectas unum et idem esse."[32] It may be that the undeveloped pantheism and rationalism of the Jewish philosophers had a deeper influence than he himself was aware of, in emancipating him from the traditions of the synagogue, and giving to his mind its first philosophical bias. In his earlier work there are Neoplatonic ideas and expressions which in the *Ethics* are rejected or remoulded into a form more suitable to the spirit of Cartesianism. But the question, after all, has little more than a

biographical interest. In the Spinozistic philosophy there are few differences from Descartes which cannot be traced to the necessary development of Cartesian principles; and the comparison of Malebranche shows that a similar development might take place under the most diverse intellectual conditions. What is most remarkable in Spinoza is just the freedom and security with which these principles are followed out to their last result. His Jewish origin and his breach with Judaism completely isolated him from every influence but that of the thought that possesses him. And no scruple or hesitation, no respect for the institutions or feelings of his time interferes with his speculative consequence. He exhibits to us the almost perfect type of a mind without superstitions, which has freed itself from all but reasoned and intelligent convictions, or, in the Cartesian phrase, “clear and distinct ideas”; and when he fails, it is not by any inconsistency, or arbitrary stopping short of the necessary conclusions of his logic, but by the essential defect of his principles.

Geometrical method applied to metaphysics.

Spinoza takes his idea of method from mathematics, and after the manner of Euclid, places at the head of each book of his *Ethics* a certain number of definitions, axioms, and postulates which are supposed to be intuitively certain, and to form a sufficient basis for all that follows. Altogether there are twenty-seven definitions, twenty axioms, and eight postulates. If Spinoza is regarded as the most consequent of philosophers it cannot be because he has based his system upon so many fragmentary views of truth; it must be because a deeper unity has been discerned in the system than is visible on the first aspect of it. We must, therefore, to a certain extent distinguish between the form and the matter of his thought, though it is also true that the defective form itself involves a defect in the matter.

What in the first instance recommends the geometrical method to Spinoza is, not only its apparent exactness and the necessity of its sequence, but, so to speak, its disinterestedness. Confusion of thought arises from the fact that we put ourselves, our desires and feelings and interests, into our view of things; that we do not regard them as they are in themselves, in their essential nature, but look for some final cause, that is, some relation to ourselves by which they may be explained. For this reason, he says, “the truth might for ever have remained hid from the human race, if mathematics, which looks not to the final cause of figures, but to their essential nature and the properties involved in it, had not set another type of knowledge before them.” To understand things is to see how all that is true of them flows from the clear and distinct idea expressed in their definition, and ultimately, it is to see how all truth flows from the *essentia Dei* as all geometrical truth flows from the idea of quantity. To take a mathematical view of the universe, therefore, is to raise ourselves above all consideration of the end or tendency of things, above the fears and hopes of mortality into the region of truth and necessity. “When I turned my mind to this subject,” he says in the beginning of his treatise on politics, “I did not propose to myself any novel or strange aim, but simply to demonstrate by certain and indubitable reason those things which agree best with practice. And in order that I might inquire into the matters of this science with the same freedom of mind with which we are wont to treat lines and surfaces in mathematics, I determined not to laugh or to weep over the actions of men, but simply to understand them; and to contemplate their affections and passions, such as love, hate, anger, envy, arrogance, pity and all other disturbances of soul not as vices of human nature, but as properties pertaining to it in the same way as heat, cold, storm, thunder pertain to the nature of the atmosphere. For these, though troublesome, are yet necessary, and have certain causes through which we may come to understand them, and thus, by contemplating them in their truth, gain for our minds as much joy as by the knowledge of things that are pleasing to the senses.” All our errors as to the nature of things arise from our judging them from the point of view of the part and not of the whole, from appoint of view determined by their relation to our own individual being, and not from a point of view determined by the nature of the things themselves; or, to put the same thing in another way, from the point of view of sense and imagination, and not from the point of view of intelligence. Mathematics shows us the inadequacy of such knowledge when it takes us out of ourselves into things, and when it presents these things to us as objects of universal intelligence apart from all special relation to our individual feelings. And Spinoza only wishes that the same universality and freedom of thought which belongs to mathematics, because its objects *do not* interest the passions, should be extended to those objects that *do* interest them. Purity from interest is the first condition of the philosopher’s being; he must get beyond the illusion of sense and passion that makes our own lives so supremely important and interesting to us simply because they are our own. He must look at the present as it were through an inverted telescope of reason, that will reduce it to its due proportion and place in the sum of things. To the heat of passion and the higher heat of imagination, Spinoza has only one advice—“Acquaint yourself with God and be at peace.” Look not to the particular but to the universal, view things not under the form of the finite and temporal, but *sub quadam specie aeternitatis.*

The illusion of the finite—the illusion of sense, imagination and passion, which, in Bacon’s language, tends to make men judge of things *ex analogia hominis* and not *ex analogia*

Sense the source of error.

universi, which raises the individual life, and even the present moment of the individual life, with its passing feelings, into the standard for measuring the universe—this, in the eyes of Spinoza, is the source of all error and evil to man. On the other hand, his highest good is to live the universal life of reason, or what is the same thing, to view all things from their centre in God, and to be moved only by the passion for good in general, "the intellectual love of God." In the treatise *De Emendatione Intellectus*, Spinoza takes up this contrast in the first instance from its moral side. "All our felicity or infelicity is founded on the nature of the object to which we are joined by love." To love the things that perish is to be in continual trouble and disturbance of passion; it is to be full of envy and hatred towards others who possess them; it is to be ever striving after that which, when we attain it, does not satisfy us; or lamenting over the loss of that which inevitably passes away from us; only "love to an object that is infinite and eternal feeds the soul with a changeless and unmingled joy." But again our love rests upon our knowledge; if we saw things as they really are we should love only the highest object. It is because sense and imagination give to the finite an independence and substantiality that do not belong to it, that we waste our love upon it as if it were infinite. And as the first step towards truth is to understand our error, so Spinoza proceeds to explain the defects of common sense, or in other words, of that first and unreflected view of the world which he, like Plato, calls opinion. Opinion is a kind of knowledge derived partly from hearsay, and partly from *experientia vaga*. It consists of vague and general conceptions of things, got either from the report of others or from an experience which has not received any special direction from intelligence. The mind that has not got beyond the stage of opinion takes things as they present themselves in its individual experience; and its beliefs grow up by association of whatever happens to have been found together in that experience. And as the combining principle of the elements of opinion is individual and not universal, so its conception of the world is at once fragmentary and accidental. It does not see things in their connexion with the unity of the whole, and hence it cannot see them in their true relation to each other. "I assert expressly," says Spinoza, "that the mind has no adequate conception either of itself or of external things, but only a confused knowledge of them, so long as it perceives them only in the common order of nature, *i.e.* so long as it is *externally determined* to contemplate this or that object by the accidental concourse of things, and so long as it is not *internally* determined by the unity of thought in which it considers a number of things to understand their agreements, differences and contradictions."[33]

Vices of abstraction and imagination.

There are two kinds of errors which are usually supposed to exclude each other, but which Spinoza finds to be united in opinion. These are the errors of abstraction and imagination; the former explains its vice by defect, the latter its vice by excess. On the one hand, opinion is abstract and one-sided; it is defective in knowledge and takes hold of things only at one point. On the other hand, and just because of this abstractness and one-sidedness, it is forced to give an artificial completeness and independence to that which is essentially fragmentary and dependent. The word "abstract" is misleading, in so far as we are wont to associate with abstraction the idea of a mental effort by which parts are separated from a given whole; but it may be applied without violence to any imperfect conception, in which things that are really elements of a greater whole are treated as if they were *res completae*, independent objects, complete in themselves. And in this sense the ordinary consciousness of man is often the victim of abstractions when it supposes itself most of all to be dealing with realities. The essences and substances of the schoolman may delude him, but he cannot think these notions clearly without seeing that they are only abstract elements of reality, and that they have a meaning only in relation to the other elements of it. But common sense remains unconscious of its abstractness because imagination gives a kind of substantiality to the fragmentary and limited, and so makes it possible to conceive it as an independent reality. Pure intelligence seeing the part as it is in itself could never see it but as a part. Thought, when it rises to clearness and distinctness in regard to any finite object, must at once discern its relation to other finite objects and to the whole,—must discern, in Spinozistic language, that it is "modal" and not "real." But though it is not possible to *think* the part as a whole it is possible to picture it as a whole. The limited image that fills the mind's eye seems to need nothing else for its reality. We cannot think a house clearly and distinctly in all the connexion of its parts with each other without seeing its necessary relation to the earth on which it stands, to the pressure of the atmosphere, &c. The very circumstances by which the possibility of such an existence is explained make it impossible to conceive it apart from other things. But nothing hinders me from resting on a house as a complete picture by itself. Imagination represents things in the externality of space and time, and is subjected to no other conditions but those of space and time. Hence it can begin anywhere and stop anywhere. For the same cause it can mingle and confuse together all manner of inconsistent forms—can imagine a man with a horse's head, a candle blazing in vacuo, a speaking tree, a man changed into an animal. There may be elements in the nature of these things that would prevent such combinations; but these elements are not necessarily present to the ordinary

consciousness, the abstractness of whose conceptions leaves it absolutely at the mercy of imagination or accidental association. To thought in this stage anything is possible that can be pictured. On the other hand, as knowledge advances, this freedom of combination becomes limited, "the less the mind understands and the more it perceives the greater is its power of fiction, and the more it understands the narrower is the limitation of that power. For just as in the moment of consciousness we cannot imagine that we do not think, so after we have apprehended the nature of body we cannot conceive of a fly of infinite size, and after we know the nature of a soul we cannot think of it as a square, though we may use the words that express these ideas."[34] Thus, according to Spinoza, the range of possibility narrows as knowledge widens, until to perfected knowledge posibility is lost in necessity.

Insufficiency of the individual.

From these considerations it follows that all thought is imperfect that stops short of the absolute unity of all things. Our first imperfect notion of things as isolated from each other, or connected only by co-existence and succession, is a mere imagination of things. It is a fictitious substantiation of isolated moments in the eternal Being. Knowledge, so far as it deals with the finite, is engaged in a continual process of self-correction which can never be completed, for at every step there is an element of falsity, in so far as the mind rests in the contemplation of a certain number of the elements of the world, as if they constituted a complete whole by themselves, whereas they are only a part, the conception of which has to be modified at the next step of considering its relation to the other parts. Thus we rise from individuals of the first to individuals of the second order, and we cannot stop short of the idea of "all nature as one individual whose parts vary through an infinite number of modes, without change of the whole individual."[35] At first we think of pieces of matter as independent individuals, either because we can picture them separately, or because they preserve a certain proportion or relation of parts through their changes. But on further consideration, these apparent substances sink into modes, each of which is dependent on all the others. All nature is bound together by necessary law, and not an atom could be other than it is without the change of the whole world. Hence it is only in the whole world that there is any true individuality or substance. And the same principle applies to the minds of men. Their individuality is a mere semblance caused by our abstraction from their conditions. Isolate the individual man, and he will not display the character of a thinking being at all. His whole spiritual life is bound up with his relations to other minds, past and present. He has such a life, only in and through that universal life of which he is so infinitesimal a part that his own contribution to it is as good as nothing. "Vis qua homo in existendo perseverat limitata est, et a potentia causarum externarum infinite superatur."[36] What can be called his own? His body is a link in a cyclical chain of movement which involves all the matter of the world, and which as a whole remains without change through all. His mind is a link in a great movement of thought, which makes him the momentary organ and expression of one of its phases. His very consciousness of self is marred by a false abstraction, above which he must rise ere he can know himself as he really is.

"Let us imagine," says Spinoza in his fifteenth letter, "a little worm living in blood which has vision enough to discern the particles of blood, lymph, &c., and reason enough to observe how one particle is repelled by another with which it comes into contact, or communicates a part of its motion to it. Such a worm would live in the blood as we do in this part of the universe, and would regard each particle of it, not as a part, but as a whole, nor could it know how all the parts are influenced by the universal nature of the blood, and are obliged to accommodate themselves to each other as is required by that nature, so that they co-operate together according to a fixed law. For if we suppose that there are no causes outside of the blood which could communicate new motions to it, and no space beyond the blood, nor any other bodies to which its particles could transfer their motion, it is certain that the blood as a whole would always maintain its present state, and its particles would suffer no other variations than those which may be inferred from the given relation of the motion of the blood to lymph, chyle, &c. And thus in that case the blood would require to be considered always as a whole and not as a part. But since there are many other causes which influence the laws of the nature of blood, and are in turn influenced thereby, other motions and other variations must arise in the blood which are not due to the proportion of motion in its constituents but also to the relation between that motion and external causes. And therefore we cannot consider the blood as a whole, but only as a part of a greater whole."

"Now we can think, and indeed ought to think, of all natural bodies in the same manner in which we have thought of this blood, for all bodies are surrounded by other bodies, and reciprocally determine and are determined by them, to exist and operate in a fixed and definite way, so as to preserve the same ratio of motion and rest in the whole universe. Hence it follows that every body, in so far as it exists under a certain definite modification, ought to be considered as merely a part of the whole universe which agrees with its whole, and thereby is in intimate union with all the other parts; and since the nature of the universe is not limited like that of the blood, but absolutely infinite, it is clear that by this nature, with its

infinite powers, the parts are modified in an infinite number of ways, and compelled to pass through an infinity of variations. Moreover, when I think of the universe as a substance, I conceive of a still closer union of each part with the whole; for, as I have elsewhere shown, it is the nature of substance to be infinite, and therefore every single part belongs to the nature of the corporeal substance, so that apart therefrom it neither can exist nor be conceived. And as to the human mind, I think of it also as of part of nature, for I think of nature as having in it an infinite power of thinking, which, as infinite, contains in itself the idea of all nature, and whose thoughts run parallel with all existence."

From this point of view it is obvious that our knowledge of things cannot be real and adequate, except in so far as it is determined by the idea of the whole, and proceeds from the whole to the parts. A knowledge that proceeds from part to part must always be imperfect; it must remain external to its object, it must deal in abstractions or mere *entia rationis*, which it may easily be led to mistake for realities. Hence Spinoza, like Plato, distinguishes reason whose movement is regressive (from effect to cause, from variety to unity) from *scientia intuitiva*, whose movement is progressive, which "proceeds from the adequate idea of certain of God's attributes to an adequate knowledge of the nature of things."[37] The latter alone deserves to be called science in the highest sense of the term. "For in order that our mind may correspond to the exemplar of nature, it must develop all its ideas from the idea that represents the origin and source of nature, so that that idea may appear as the source of all other ideas."[38] The regressive mode of knowledge has its highest value in preparing for the progressive. The knowledge of the finite, ere it can become perfectly adequate, must be absorbed and lost in the knowledge of the infinite.

The whole dominates the parts.

In a remarkable passage in the *Ethics*, Spinoza declares that the defect of the common consciousness of men lies not so much in their ignorance, either of the infinite or of the finite, as in their incapacity for bringing the two thoughts together, so as to put the latter in its proper relation to the former. All are ready to confess that God is the cause both of the existence and of the nature of things created, but they do not realize what is involved in this confession—and hence they treat created things as if they were substances, that is, as if they were Gods. "Thus while they are contemplating finite things, they think of nothing less than of the divine nature; and again when they turn to consider the divine nature, they think of nothing less than of their former fictions on which they have built up the knowledge of finite things, as if these things could contribute nothing to our understanding of the divine nature. Hence it is not wonderful that they are always contradicting themselves."[39] As Spinoza says elsewhere, it belongs to the very nature of the human mind to know God, for unless we know God we could know nothing else. The idea of the absolute unity is involved in the idea of every particular thing, yet the generality of men, deluded by sense and imagination, are unable to bring this implication into clear consciousness, and hence their knowledge of God does not modify their view of the finite. It is the business of philosophy to correct this defect, to transform our conceptions of the finite by relating it to the infinite, to complement and complete the partial knowledge produced by individual experience by bringing it into connexion with the idea of the whole. And the vital question which Spinoza himself prompts us to ask is how far and in what way this transformation is effected in the Spinozistic philosophy.

Finite things modes of infinite substance.

There are two great steps in the transformation of knowledge by the idea of unity as that idea is conceived by Spinoza. The first step involves a change of the conception of individual finite things by which they lose their individuality, their character as independent substances, and come to be regarded as modes of the infinite. But secondly, this negation of the finite as such is not conceived as implying the negation of the distinction between mind and matter. Mind and matter still retain that absolute opposition which they had in the philosophy of Descartes, even after all limits have been removed. And therefore in order to reach the absolute unity, and transcend the Cartesian dualism, a second step is necessary, by which the independent substantiality of mind and matter is withdrawn, and they are reduced into attributes of the one infinite substance. Let us examine these steps successively.

The method by which the finite is reduced into a mode of the infinite has already been partially explained. Spinoza follows to its legitimate result the metaphysical or logical principles of Descartes and Malebranche. According to the former, as we nave seen, the finite presupposes the infinite, and, indeed, so far as it is real, it is identical with the infinite. The infinite is absolute reality, because it is pure affirmation, because it is that which *negationem nullam involvit*. The finite is distinguished from it simply by its limit, *i.e.* by its wanting something which the infinite has. At this point Spinoza takes up the argument. If the infinite be the real, and the finite, so far as it is distinguished therefrom, the unreal, then the supposed substantiality or individuality of finite beings is an illusion. In itself the finite is but an abstraction, to which imagination has given an apparent independence. All limitation or

Application to nature of matter.

determination is negative, and in order to apprehend positive reality we must abstract from limits. By denying the negative, we reach the affirmative; by annihilating finitude in our thought, and so undoing the illusory work of the imagination, we reach the indeterminate or unconditioned being which alone truly is. All division, distinction and relation are but *entia rationis.* Imagination and abstraction can give to them, as they can give to mere negation and nothingness, "a local habitation and a name," but they have no objective meaning, and in the highest knowledge, in the *scientia intuitiva*, which deals only with reality, they must entirely disappear. Hence to reach the truth as to matter, we must free ourselves from all such ideas as figure or number, measure or time, which imply the separation and relation of parts. Thus in his 50th letter, in answer to some question about figure, Spinoza says, "to prove that figure is negation, and not anything positive, we need only consider that the whole of matter conceived indefinitely, or in its infinity, can have no figure; but that figure has a place only in finite or determinate bodies. He who says that he perceives figure, says only that he has before his mind a limited thing and the manner in which it is limited. But this limitation does not pertain to a thing in its 'esse,' but contrariwise in its 'non-esse' (*i.e.* it signifies, not that some positive quality belongs to the thing, but that something is wanting to it). Since, then, figure is but limitation, and limitation is but negation, we cannot say that figure is anything." The same kind of reasoning is elsewhere (*Epist.* 29) applied to solve the difficulties connected with the divisibility of space or extension. Really, according to Spinoza, extension is indivisible, though modally it is divisible. In other words, parts *ad infinitum* may be taken in space by the abstracting mind, but these parts have no separate existence. You cannot rend space, or take one part of it out of its connexion with other parts. Hence arises the impossibility of asserting either that there is an infinite number of parts in space, or that there is not. The solution of the antinomy is that neither alternative is true. There are many things "quae nullo numero explicari possunt," and to understand these things we must abstract altogether from the idea of number. The contradiction arises entirely from the application of that idea to the infinite. We cannot say that space has a finite number of parts, for every finite space must be conceived as itself included in infinite space. Yet, on the other hand, an infinite number is an absurdity; it is a number which is not a number. We escape the difficulty only when we see that number is a category inapplicable to the infinite, and this to Spinoza means that it is not applicable to reality, that it is merely an abstraction, or *ens imaginationis.*

Nature of mind.

The same method which solves the difficulties connected with the nature of matter is applied to mind. Here also we reach the reality, or thing in itself, by abstracting from all determination. All conceptions, therefore, that involve the independence of the finite, all conceptions of good, evil, freedom and responsibility disappear. When W. Blyenburg accuses Spinoza of making God the author of evil, Spinoza answers that evil is an *ens rationis* that has no existence for God. "Evil is not something positive, but a state of privation, and that not in relation to the divine, but simply in relation to the human intelligence. It is a conception that arises from that generalizing tendency of our minds, which leads us to bring all beings that have the external form of man under one and the same definition, and to suppose that they are all equally capable of the highest perfection we can deduce from such a definition. When, therefore, we find an individual whose works are not consistent with this perfection, straightway we judge that he is deprived of it, or that he is diverging from his own nature,—a judgment we should never make if we had not thus referred him to a general definition, and supposed him to be possessed of the nature it defines. But since God does not know things abstractly, or through such general definitions, and since there cannot be more reality in things than the divine intelligence and power bestows upon them, it manifestly follows that the defect which belongs to finite things, cannot be called a privation in relation to the intelligence of God, but only in relation to the intelligence of man."[40] Thus evil and good vanish when we consider things *sub specie aeternitatis*, because they are categories that imply a certain independence in finite beings. For the idea of a moral standard implies a relation of man to the absolute good, a relation of the finite to the infinite, in which the finite is not simply lost and absorbed in the infinite. But Spinoza can admit no such relation. In the presence of the infinite the finite disappears, for it exists only by abstraction and negation; or it *seems* to us to exist, not because of what is present to our thoughts, but because of what is not present to them. As we think ourselves free because we are conscious of our actions but not of their causes, so we think that we have an individual existence only because the infinite intelligence is not wholly but only partially realized in us. But as we cannot really divide space, though we can think of a part of it, so neither can we place any real division in the divine intelligence. In this way we can understand how Spinoza is able to speak of the human mind as part of the infinite thought of God, and of the human body as part of the infinite extension of God, while yet he asserts that the divine substance is simple, and not made up of parts. So far as they exist, they must be conceived as parts of the divine substance, but when we look directly at that divine substance their separate existence altogether disappears.

It has, however, been already mentioned that this ascending movement of abstraction does

not at once and directly bring Spinoza to the absolute unity of substance. The principle that "determination is negation," and that therefore the absolute reality is to be found only in the indeterminate, would lead us to expect this conclusion; but the Cartesian dualism prevents Spinoza from reaching it. Mind and matter are so absolutely opposed, that even when we take away all limit and determination from both, they still retain their distinctness. Raised to infinity, they still refuse to be identified. We are forced, indeed, to take from them their substantial or substantive existence, for there can be no other substance but God, who includes all reality in himself. But though reduced to attributes of a common substance, the difference of thought and extension is insoluble. The independence of individual finite things disappears whenever we substitute thought for imagination, but even to pure intelligence, extension remains extension, and thought remains thought. Spinoza seems therefore reduced to a dilemma; he cannot surrender either the unity or the duality of things, yet he cannot relate them to each other. The only course left open to him is to conceive each attribute in its turn as the whole substance, and to regard their difference as the difference of expression. As the patriarch was called by the two names of Jacob and Israel, under different aspects, each of which included the whole reality of the man, so our minds apprehend the absolute substance in two ways, each of which expresses its whole nature.[41] In this way the extremes of absolute identity and absolute difference seem to be reconciled. There is a complete parallelism of thought and extension, "ordo et connexio idearum idem est ac ordo et connexio rerum,"[42] yet there is also a complete independence and absence of relation between them, for each is the whole. A thing in one expression cannot be related to itself in another expression. Hence in so far as we look at the substance under the attribute of thought, we must take no account of extension, and in so far as we look at it under the attribute of extension, we must equally refuse to take any account of thought. This parallelism may be best illustrated by Spinoza's account of the relation of the human soul and body. The soul is the idea of the body, and the body is the object of the soul, whatever is in the one really is in the other ideally; yet this relation of object and subject does not imply any connexion. The motions and changes of the body have to be accounted for partly by itself, partly by the influence of other bodies; and the thoughts of the soul in like manner have to be accounted for partly by what God thinks as constituting the individual mind, and partly by what he thinks as constituting the minds of other individuals. But to account for thought by the motions of the body, or for the motions of the body by thought, is to attempt to bridge the impassable gulf between thought and extension. It involves the double absurdity of accounting for a thing by itself, and of accounting for it by that which has nothing in common with it.

Soul and body.

Spinoza's refuge from Descartes' dualism.

In one point of view, this theory of Spinoza deserves the highest praise for that very characteristic which probably excited most odium against it at the time it was first published, namely, its exaitation of matter. It is the mark of an imperfect spiritualism to hide its eyes from outward nature, and to shrink from the material as impure and defiling. But its horror and fear are proofs of weakness; it flies from an enemy it cannot overcome. Spinoza's bold identification of spirit and matter, God and nature, contains in it the germ of a higher idealism than can be found in any philosophy that asserts the claims of the former at the expense of the latter. A system that begins by making nature godless, will inevitably end, as Schelling once said, in making God unnatural. The expedients by which Descartes keeps matter at a distance from God, were intended to maintain his pure spirituality; but their ultimate effect was seen in his reduction of the spiritual nature to mere will. As Christianity has its superiority over other religions in this, that it does not end with the opposition of the human to the divine, the natural to the spiritual, but ultimately reconciles them, so a true idealism must vindicate its claims by absorbing materialism into itself. It was, therefore, a true instinct of philosophy that led Spinoza to raise matter to the co-equal of spirit, and at the same time to protest against the Cartesian conception of matter as mere inert mass, moved only by impulse from without. "What were a God that only impelled the world from without?" says Goethe. "It becomes him to stir it by an inward energy, to involve nature in himself, himself in nature, so that that which lives and moves and has a being in him can never feel the want of his power or his spirit."

Spinoza's higher idealsim.

While, however, Spinoza thus escapes some of the inconsequences of Descartes, the contradiction that was *implicit* in the Cartesian system between the duality and the unity, the attributes and the substance, in his system becomes *explicit*. When so great emphasis is laid upon the unity of substance, it becomes more difficult to explain the difference of the attributes. The result is, that Spinoza is forced to account for it, not by the nature of substance itself, but by the nature of the intelligence to which it is revealed. "By substance," he says, "I understand that which is in itself, and is conceived through itself. By attribute I understand the same thing, nisi quod attributum dicatur respectu inteltectus substantiae certum talem naturam tribuentis."[43] Hence we are naturally led with J.E. Erdmann to think of the

Logical diffculties in Spinoza's

 intelligence dividing the substance as a kind of prism that breaks the white light into different colours, through each of which the same world is seen, only with a different aspect. But if the intelligence in itself is but a mode of one of the attributes, how can it be itself the source of their distinction?

The key to this difficulty is that Spinoza has really, and almost in spite of his logical principles, two opposite conceptions of substance, between which he alternates without ever bringing them to a unity. On the one hand, in accordance with the principle that determination is negation, substance must be taken as that which is utterly indeterminate, like the Absolute of the Buddhist, which we can characterize only by denying of it everything that we assert of the finite. In this view, no predicate can be applied univocally to God and to the creatures; he differs from them, not only in existence, but in essence.[44] If we follow out this view to its legitimate result, God is withdrawn into his own absolute unity, and no difference of attributes can be ascribed to him, except in respect of something else than himself. It is owing to the defects of out intelligence that he appears under different forms or expressions; in himself he is pure being, without form or expression at all. But, on the other hand, it is to be observed, that while Spinoza really proceeds by abstraction and negation, he does not *mean* to do so. The abstract is to him the unreal and imaginary, and what he means by substance is not simply Being in general, the conception that remains when we omit all that distinguishes the particulars, but the absolute totality of things conceived as a unity in which all particular existence is included and subordinated. Hence at a single stroke the indeterminate passes into the most determinate Being, the Being with no attributes at all into the Being constituted by an infinite number of attributes. And while, under the former conception, the defect of our intelligence seemed to be that it divided the substance, or saw a difference of attributes in its absolute unity, under the second conception its defect lies in its apprehending only two out of the infinite multitude of these attributes.

To do justice to Spinoza, therefore, we must distinguish between the actual effect of his logic and its effect as he conceived it. The actual effect of his logic is to dissolve all in the ultimate abstraction of Being, from which we can find no way back to the concrete. But his intent was simply to relate all the parts to that absolute unity which is the presupposition of all thought and being, and so to arrive at the most concrete and complete idea of the reality of things. He failed to see what is involved in his own principle that determination is negation; for if affirmation is impossible without negation, then the attempt to divorce the two from each other, the attempt to find a purely affirmative being, must necessarily end in the barest of all abstractions being confused with the unity of all things. But even when the infinite substance is defined as the negative of the finite, the idea of the finite becomes an essential element in the conception of the infinite. Even the Pantheist, who says that God is what finite things are not, in spite of himself recognizes that God has a relation to finite things. Finite things may in his eyes have no positive relation to God, yet they have a negative relation; it is through their evanescence and transitoriness, through their nothingness, that the eternal, the infinite reality alone is revealed to him. Spinoza is quite conscious of this process, conscious that he reaches the affirmation of substance by a negation of what he conceives as the purely negative and unreal existence of finite things, but as he regards the assertion of the finite as merely an illusion due to *our* imagination, so he regards the correction of this illusion, the negation of the finite as a movement of reflection which belongs merely to our intelligence, and has nothing to do with the nature of substance in itself. We find the true affirmation by the negation of the negative, but in itself affirmation has no relation to negation. Hence his absolute being is the dead all-absorbing substance and not the self-revealing spirit. It is the being without determination, and not the being that determines itself. There is no reason in the nature of substance why it should have either attributes or modes; neither individual finite things nor the general distinction of mind and matter can be deduced from it. The descending movement of thought is not what Spinoza himself said it should be, an evolution, but simply an external and empirical process by which the elements dropped in the ascending movement of abstraction are taken up again with a merely nominal change. For the sole difference in the conception of mind and matter as well as in the conception of individual minds and bodies which is made by their reference to the idea of God, is that they lose their substantive character and become adjectives. Aristotle objected to Plato that his ideas were merely αίσθητὰ ἀΐδια, that is, that his idealization of the world was merely superficial, and left the things idealized very much what they were before to the sensuous consciousness; and the same may be said of Spinoza's negation of finite things. It was an external and imperfect negation, which did not transform the idea of the finite, but merely substituted the names of attributes and modes for the names of general and individual substances.

The same defective logic, by which the movement of thought in determining the substance is regarded as altogether external to the substance itself, is seen again in Spinoza's conceptions of the relations of the attributes to each other. Adopting the Cartesian opposition of mind and matter, he does not see, any more than Descartes, that in their opposition they

are correlative. Or if he did see it (as seems possible from a passage in his earliest treatise),[45] he regarded the correlation as merely subjective, merely belonging to our thought. They are to him only the two attributes which we happen to know out of the infinite number belonging to God. There is no necessity that the substance should manifest itself in just these attributes and no others, for abstract substance is equally receptive of all determinations, and equally indifferent to them all. Just because the unity is merely generic, the differences are accidental, and do not form by their union any complete whole. If Spinoza had seen that matter in itself is the correlative opposite of mind in itself, he need not have sought by abstracting from the difference of these elements to reach a unity which is manifested in that very difference, and his absolute would have been not substance but spirit. This idea he never reached, but we find him approximating to it in two ways. On the one hand, he condemns the Cartesian conception of matter as passive and self-external, or infinitely divisible—as, in short, the mere opposite of thought.[46] And sometimes he insists on the parallelism of extension and thought at the expense of their opposition in a way that almost anticipates the assertion by Leibnitz of the essential identity of mind and matter. On the other hand, he recognizes that this parallelism is not complete. Thought is not like a picture; it is conscious, and conscious not only of itself, but of extension. It transcends therefore the absolute distinction between itself and other attributes. It is only because he cannot rid himself of the phantom of an extended matter as a thing in itself, which is entirely different from the idea of it, that Spinoza is prevented from recognising in mind that unity that transcends all distinctions, even its own distinction from matter. As it is, his main reason for saying that intelligence is not an attribute of God, but merely a mode, seems to be this, that the thought of God must be conceived as producing its own object, *i.e.* as transcending the distinction of subject and object which is necessary to our intelligence.[47] But this argument of itself points to a concrete quite as much as to an abstract unity. It is as consistent with the idea of absolute spirit as with that of absolute substance. Spinoza's deliberate and formal doctrine is undoubtedly the latter; but he constantly employs expressions which imply the former, as when he speaks of God as *causa sui*. The higher idea inspires him, though his consciousness only embraces the lower idea.

Spinoza's ethical system.

The ethical philosophy of Spinoza is determined by the same principles and embarrassed by the same difficulties as his metaphysics. In it also we find the same imperfect conception of the relation of the positive to the negative elements, and, as a consequence, the same confusion of the highest unity of thought, the affirmation that subordinates and transcends all negation with mere abstract affirmation. Or, to put the same thing in ethical language, Spinoza teaches a morality which is in every point the opposite of asceticism, a morality of self-assertion or self-seeking, and not of self-denial. The *conatus sese conservandi* is to him the supreme principle of virtue;[48] yet this self-seeking is supposed, under the guidance of reason, to identify itself with the love of man and the love of God, and to find blessedness not in the reward of virtue, but in virtue itself. It is only confusion of thought and false mysticism that could object to this result on the ground of the element of self still preserved in the *amor Dei intellectualis*. For it is just the power of identifyihg himself with that which is wider and higher than his individual being that makes morality possible to man. But the difficulty lies in this, that Spinoza will not admit the negative element, the element of mortification or sacrifice, into morality at all, even as a moment of transition. For him there is no dead self, by which we may rise to higher things, no losing of life that we may find it. For the negative is nothing, it is evil in the only sense in which evil exists, and cannot be the source of good. The higher affirmation of our own being, the higher seeking of ourselves which is identical with the love of God, must therefore be regarded as nothing distinct in kind from that first seeking of our natural self which in Spinoza's view belongs to us in common with the animals, and indeed in common with all beings whatever. It must be regarded merely as a direct development and extension of the same thing. The main interest of the Spinozistic ethics therefore lies in observing by what steps he accomplishes this transition, while excluding altogether the idea of a real division of the higher and the lower life, the spirit and flesh, and of a conflict in which the former is developed through the sacrifice of the latter.

Finite creatures exist only as modes of the divine substance, only so far as they partake in the infinite, or what is the same thing with Spinoza, in the purely affirmative or self-affirming nature of God. They therefore must also be self-affirming. They can never limit themselves; their limit lies in this, that they are not identified with the infinite substance which expresses itself also in other modes. In other words, the limit of any finite creature, that which makes it finite, lies without it, and its own existence, so far as it goes, must be pure self-assertion and self-seeking. "Unaquaeque res quantum in se est in suo esse perseverare conatur," and this *conatus* is its very essence or inmost nature.[49] In the animals this *conatus* takes the form of appetite, in man of desire, which is "appetite with the consciousness of it."[50] But this constitutes no essential difference between appetite and desire, for "whether a man be conscious of his appetite or no, the appetite remains one and the same thing."[51] Man therefore, like the animals, is purely self-asserting and self-seeking. He can neither know nor

will anything but his own being, or if he knows or wills anything else, it must be something involved in his own being. If he knows other beings, or seeks their good, it must be because their existence and their good are involved in his own. If he loves and knows God it must be because he cannot know himself without knowing God, or find his supreme good anywhere but in God.

What at first makes the language difficult to us is the identification of will and intelligence. Both are represented as affirming their objects. Descartes had prepared the way for this when he treated the will as the faculty of judging or giving assent to certain combinations of ideas, and distinguished it from the purely intellectual faculties by which the ideas are apprehended. By this distinction he had, as he supposed, secured a place for human freedom. Admitting that intelligence is under a law of necessity, he claimed for the Will a certain latitude or liberty of indifference, a power of giving or withholding assent in all cases where the relations of ideas were not absolutely clear and distinct. Spinoza points out that there is no ground for such a distinction, that the acts of apprehension and judgment cannot be separated from each other. "In the mind there is no volition, *i.e.* no affirmation or negation which is not immediately involved in the idea it apprehends," and therefore "intellect and will are one and the same thing."[52] If, then, there is no freedom except the liberty of indifference, freedom is impossible. Man, like all other beings and things, is under an absolute law of necessity. All the actions of his will, as well as of his intelligence, are but different forms of the self-assertive tendency to which he cannot but yield, because it is one with his very being, or only ideally distinguishable therefrom. There is, however, another idea of liberty. Liberty as the opposite of necessity is an absurdity—it is impossible for either God or man; but liberty as the opposite of slavery is possible, and it is actually possessed by God. The divine liberty consists in this, that God acts from the necessity of his own nature alone, and is not in any way determined from without. And the great question of ethics is, How far can man partake in this liberty? At first it would seem impossible that he should partake in it. He is a finite being, whose power is infinitely surpassed by the power of other beings to which he is related. His body acts only as it is acted on, and his mind cannot therefore apprehend his body, except as affected by other things. His self-assertion and self-seeking are therefore confused with the asserting and seeking of other things, and are never pure. His thought and activity cannot be understood except through the influence of other things which lie outside of his consciousness, and upon which his will has no influence. He cannot know clearly and distinctly either himself or anything else; how then can he know his own good or determine himself by the idea of it?

The answer is the answer of Descartes, that the apprehension of any finite thing involves the adequate idea of the infinite and eternal nature of God.[53] This is the primary object of intelligence, in which alone is grounded the possibility of knowing either ourselves or anything else. In so far as our knowledge is determined by this idea, or by the ideas of other things, which are referred to this idea and seen in its light, in so far its action flows from an internal and not an external necessity. In so far, on the other hand, as we are determined by the affections of the body, ideas in which the nature of our own body and the nature of other things are confused together, in so far we are determined by an external necessity. Or to put the same thing in what has been shown to be merely another way of expression, in so far as we are determined by pure intelligence we are free, but in so far as we are determined by opinion and imagination we are slaves.

From these premises it is easy to see what form the opposition of reason and passion must necessarily take with Spinoza. The passions belong to our nature as finite; they are grounded on, or rather are but another form of inadequate ideas; but we are free only in so far as our ideas either immediately are, or can be made, adequate. Our idea of God is adequate *ex vi termini*; our ideas of the affections of our body are inadequate, but can be made adequate in so far as they are referred to the idea of God. And as the idea of God is purely affirmative, this reference to the idea of God implies the elimination of the negative element from the ideas of the affections of the body, "for nothing that is positive in a false idea is removed by the presence of truth as such."[54] Brought into contact with the idea of God, all ideas become true and adequate, by the removal of the negative or false element in them. The idea of God is, as it were, the touchstone which distinguishes the gold from the dross. It enables us to detect the higher spiritual element in the natural passions, and to sever the element belonging to that pure love of self which is identical with the love of perfection from the elements belonging to that impure love of our own finite individuality as such which is identical with the love of evil.

Implicit difficulties.

The imperfection in Spinoza's development of this principle has already been indicated. It is in fact the same imperfection which runs through his whole system. Just as he supposed that the ideas of finite things were at once made consistent with the idea of the infinite when he had named them modes, so here his conception of the change through which selfish natural desire must pass in order to become spiritual is far too superficial and external. Hence he has no sympathy with

asceticism, but treats it, like Bentham, as a *torva el tristis superstitio*. Joy is the "transition from less to greater perfection," and cannot be but good; pain is the "transition from greater to less perfection," and cannot be but evil. The revolt against the medieval opposition of the nature and spirit is visible in many of his sayings. "No Deity who is not envious can delight in my weakness or hurts, or can regard as virtues those fears and sighs and tears which are the signs of the mind's weakness; but contrariwise, the greater is our joy, the greater is our progress to perfection, and our participation in the divine nature."[55] "A free man thinks of nothing less than death, his wisdom is a meditation not of death but of life."[56] The same idea, combining with the idea of necessity, leads him to condemn repentance and pity, as well as pride and humility. Unconsciously, Spinoza reproduces the principle of asceticism, while in words he utterly rejects it. For though he tells us that pure self-complacency is the highest thing we can hope, yet from this self-complacency all regard to the finite individuality of the subject is eliminated. "Qui Deum amat, conari non potest ut Deus ipsum contra amet." In like manner, he absolutely condemns all hatred, envy, rivalry and ambition, as springing out of an over-estimate of those finite things which one only can possess, while the highest good is that which is enjoyed the more easily and fully the greater the number of participants. Yet Spinoza's exaltation of the social life, and of the love that binds it together, is too like the Buddhist's universal charity that embraces all creatures, and all creatures equally. Both are based on an abstraction from all that is individual, only the Buddhist's abstraction goes a step further, and erases even the distinction between man and the animals. Spinoza felt the pressure of this all-levelling logic when he said, "I confess I cannot understand how spirits express God more than the other creatures, for I know that between the finite and the infinite there is no proportion, and that the distinction between God and the most excellent of created things differs not a whit from the distinction between him and the lowest and meanest of them."[57] As Pope said, God is "as full and perfect in a hair as a heart"; in all finite things there is a ray of divinity, and in nothing more than a ray. Yet in another epistle Spinoza contradicts this view, and declares that, while he does not consider it necessary to "know Christ after the flesh, he does think it is necessary to know the eternal Son of God, *i.e.* God's eternal wisdom, which is manifested in all things, but chiefly in the mind of man, and most of all in Christ Jesus."[58] In the *Ethics* the distinction of man and the animals is treated as an absolute distinction, and it is asserted with doubtful consistency that the human soul cannot all be destroyed along with the body, for that there is something of it which is eternal. Yet from this eternity we must, of course, eliminate all notion of the consciousness of the finite self as such. At this point, in short, the two opposite streams of Spinoza's thought, the positive method he *intends* to pursue, and the negative or abstracting method he really *does* pursue, meet in irreconcilable contradiction. The finite must be related to the infinite so as to preserve all that is in it of reality; and therefore its limit or the negative element in it must be abstracted from. But it turns out that, with this abstraction from a negative element involved in the existence of the finite, the positive also disappears, and God is all in all in a sense that absolutely excludes the existence of the finite. "The mind's intellectual love of God," says Spinoza, "is the very love wherewith God loves himself, not in so far as he is infinite, but in so far as he can be expressed by the essence of the human mind, considered under the form of eternity; *i.e.* the mind's intellectual love of God is part of the infinite love wherewith God loves himself."[59] This double "in so far," which returns so frequently in Spinoza, just conceals for a moment the contradiction of two streams of thought, one of which must be swallowed up by the other, if they are once allowed to meet.

We have now reviewed the main points of the system, which was the ultimate result of the principles of Descartes. The importance of this first movement of modern philosophy lies in its assertion and exhibition of the unity of the intelligible world with itself and with the mind of man. In this point of view, it was the philosophical counterpart of Protestantism; but, like Protestantism in its earliest phase, it passed rapidly from the doctrine that God is, without priest or authority, present to man's spirit, to the doctrine that man's spirit is as nothing before God. The object was too powerful for the subject, who effaced himself before God that he might be strong towards men. But in this natural movement of feeling and thought it was forgotten that God who effaced the world and the finite spirit by his presence could not be a living God. Spinoza gives the ultimate expression to this tendency, and at the same time marks its limit, when he says that whatever reality is in the finite is of the infinite. But he is unsuccessful in showing that, on the principles on which he starts, there can be any reality in the finite at all. Yet even if the finite be an illusion, still more if it be better than an illusion, it requires to be accounted for. Spinoza accounts for it neither as illusory nor as real. It was reserved for the following generation of philosophers to assert, in different ways, the reality of the finite, the value of experience and the futility of abstractions. Spinoza had declared that true knowledge consists in seeing things under the form of eternity, but it is impossible that things can be seen under the form of eternity unless they have been first seen under the form of time. The one-sided assertion of individuality and

General importance of the Cartesian school.

difference in the schools of Locke and Leibnitz was the natural complement of the one-sided assertion of universality and unity in the Cartesian school. But when the individualistic tendency of the 18th century had exhausted itself, and produced its own refutation in the works of Kant, it was inevitable that the minds of men should again turn to the great philosopher, who, with almost perfect insight working through imperfect logic, first formulated the idea of a unity presupposed in and transcending the difference of matter and mind, subject and object.

See the Histories of Philosophy, especially those by Hegel, Feuerbach, Erdmann and Fischer; F. Bouillier, *Histoire de la philosophie cartésienne* (1854); Ollé-Laprune, *Philosophie de Malebranche*; E. Saisset, *Précurseurs et disciples de Descartes* (1862). The German treatises on Spinoza are too numerous to mention. Jacobi's *Letters on Spinoza*, which were the beginning of a true interpretation of his philosophy, are still worth reading. We may also mention C. Schaarschmidt, *Descartes und Spinoza* (1850); C. Sigwart, *Spinozas neuentdeckter Tractat von Gott, dem Menschen, und dessen Glückseligkeit* (1866). Both these writers have published German translations of the *Tractatus de Deo.* See also Trendelenburg, *Historische Beiträge zur Philosophie* (1867); R. Avenarius, *Über die beiden ersten Phasen des spinozischen Pantheismus* (1868); M. Joël, *Zur Genesis der Lehre Spinozas* (1871); R. Willis, *Benedict de Spinoza: his Ethics, Life and Influence on Modern Religious Thought* (1870); F. Pollock, *Spinoza, his Life and Philosophy* (1880); J. Martineau, *Types of Ethical Theory* (1885); J. Caird, *Spinoza* (in Blackwood's Philosophical Series); H.H. Joachim, *A Study of the Ethics of Spinoza* (1901); R. Adamson, *The Development of Modern Philosophy* (1903); also articles DESCARTES, MALEBRANCHE, and SPINOZA.

(E. C.)

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1 For biographical details see DESCARTES; MALEBRANCHE; SPINOZA.

2 *Resp. ad secundas objectiones*, p. 74,—quoting from the Elzevir edition.

3 *Resp. ad tertias object*, p. 94.

4 *Meditatio tertia*, p. 21.

5 *Resp. quartae*, p. 234.

6 *Meditatio quarta*, p. 26.

7 *Resp. ad sec. object.* p. 75.

8 *Resp. ad sec. object.* pp. 72-73.

9 *Resp. Sextae*, 160-163.

10 *Principia*, i. 35.

11 *Notae in Programma*, p. 184.

12 *Epistolae*, i. 110.

13 *Resp. Sextae*, pp. 165-166.

14 *Epist.* i. 66, 67.

15 *Princ.* i. 60.

16 *Morale*, i. I, §2.

17 *Recherche*, iii. pt. ii. ch. vi.

18 *Recherche*, ch. vii.

19 *Recherche*, ch. i.

20 *Morale*, i. 2, § 5.

21 *Entretien*. i. § 5.

22 *Recherche*, iii. pt. ii ch. vii., § 4.

23 *Recherche*, ch. ix.

24 *Recherche*, i. pt. i. ch. i.

25 *Recherche*, i. pt. i. ch. iv.

26 *Recherche*, iv. ch. i.

27 *Entretien*, iv.

28 *Recherche*, v. ch. iv.

29 *Recherche*, iv. ch. i.

30 *Morale*, pt. i. ch. i. § 9.

31 *Recherche*, iv. ch. v.

32 *Eth.* ii. schol. 7.

33 *Eth.* i. schol. 29.

34 *De Emend.* viii. § 38.

35 *Eth.* ii. lemma, 7 schol.

36 *Eth.* iv. 3.

37 *Eth.* ii. 40, schol. 2.

38 *De Emend.* vii. § 42.

39 *Eth.* ii. schol. 10.

40 *Epist.* 32.

41 *Epist.* 27.

42 *Eth.* ii. 7.

43 *Epist.* 27.

44 *Eth.* i. schol. 17.

45 *Tractatus de Deo et homine.* ii. 19.

46 *Epist.* 29, 70.

47 *Eth.* i. schol. 17.

48 *Eth.* iv. schol. 22.

49 *Eth.* iii. 6, 7.

50 *Eth.* iii. 9.

51 *Eth.* iii. Def. Affect. 1.

52 *Eth.* ii. 49.

53 *Eth.* ii. 45.

54 *Eth.* iv. 1.

55 *Eth.* iv. schol. 45.

56 *Eth.* iv. 67.

57 *Epist.* 57.

58 *Epist.* 21.

59 *Eth.* v. 36.

CARTHAGE (Phoenician *Kart-hadshat*, "New City"; Gr. Καρχηδών, Lat. *Carthago* or *Carchedon*), one of the most famous cities of antiquity, on the north coast of Africa; it was founded about 822 B.C. by the Phoenicians, destroyed for the first time by the Romans in 146 B.C., rebuilt by the Romans, and finally destroyed by the Arabs in A.D. 698. It was situated in the heart of the Sinus Uticensis (mod. Gulf of Tunis), which is protected on the west by the promontory of Apollo (mod. Ras Ali el Mekki), and on the east by the promontory of Mercury or Cape Bon (mod. Ras Addar). Its position naturally formed a sort of bastion on the inner curve of the bay between the Lake of Tunis on the south and the marshy plain of Utica (Sukhara) on the north. Cape Gamart, the Arab village of Sidi-bu-Saïd and the small harbour of Goletta (La Goulette, Halk el Wad) form a triangle which represents the area of Carthage at its greatest, including its extramural suburbs. Of this area the highest point is Sidi-bu-Saïd, which stands on a lofty cliff about 490 ft. high. On Cape Gamart (Kamart) was the chief cemetery; the citadel, Byrsa, was on the hill on which to-day stand the convent of Les Pères Blancs (White Fathers) and the cathedral of St Louis. The harbours lay about three-fifths of a mile south of Byrsa, near the modern hospital of the Khram, at Cartagenna. The tongue of land, which runs from the harbours as far as Goletta, to the mouth of the Catadas which connects the Lake of Tunis with the sea, was known as *taenia* (ribbon, band) or *ligula* (diminutive of *lingua*, tongue). The isthmus connecting the peninsula of Carthage with the mainland was roughly estimated by Polybius as 25 stades (about 15,000 ft.); the peninsula

itself, according to Strabo, had a circumference of 360 stades (41 m.). The distance between Gamart and Goletta is about 6 m.

From Byrsa, which is only 195 ft. above the sea, there is a fine view; thence it is possible to see how Carthage was able at once to dominate the sea and the gently undulating plains which stretch westward as far as Tunis and the line of the river Bagradas (mod. Mejerda). On the horizon, on the other side of the Gulf of Tunis, rise the chief heights of the mountain-chain which was the scene of so many fierce struggles between Carthage and Rome, between Rome and the Vandals:—the Bu-Kornaïn ("Two-Horned Mountain"), crowned by the ruins of the temple of Saturn Balcaranensis; Jebel Ressas, behind which lie the ruins of Neferis; Zaghwan, the highest point in Zeugitana; Hammam-Lif, Rades (Ghades, Gades, the ancient Maxula) on the coast, and 10 m. to the south-west the "white" Tunis (λευκὸς Τύνης of Diodorus) and the fertile hills of Ariana. All round Byrsa, alike on the plain and on the slopes, are fields of barley, vineyards and patches of cactus, interrupted only by huge heaps of rubbish and excavation-mounds, the haunts of green lizards, and by houses and villages built of materials drawn for many a century from the ancient ruins.

The ancient harbours were distinguished as the military and the commercial. The remains of the latter are to be seen in a partially ruined artificial lagoon which originally, according to Beulé, had an area of nearly 60 acres; there were, however, in addition a large quay for unloading freight along the shore, and huge basins or outer harbours protected by jetties, the remains of which are still visible at the water-level. The military harbour, known as Cothon, communicated with the commercial by means of a canal now partially ruined; it was circular in shape, surrounded by large docks 16¼ ft. wide, and capable of holding 220 vessels, though its area was only some 22 acres. In the centre was an islet from which the admiral could inspect the whole fleet.[1]

Among the other ruins which have been identified are the circus or hippodrome, traversed by the railway at the north of the village of Duar-es-Shat; the forum, between Cothon and Byrsa, where stood the Curia, the regular place of assembly of the senate, and near which were the moneychangers' shops, the tribunal, the temple of Apollo, and in the Byzantine period the baths of Theodora. Three main streets led from the forum to Byrsa.

The hill of St Louis, the ancient citadel of Byrsa, has a circuit of 4525 ft. It appears to have been surrounded at least at certain points by several lines of fortifications. It was, however, dismantled by P. Scipio Africanus the younger, in 146 B.C., and was only refortified by Theodosius II. in A.D. 424; subsequently its walls were again renewed by Belisarius in 553. On the plateau of Byrsa have been found the most ancient of the Punic tombs, huge cisterns in the eastern part, and near the chapel of St Louis the foundations of the famous temple of Eshmun (see below), and the palace of the Roman proconsul.

About 325 ft. from the railway station of La Malga are the still imposing ruins of the amphitheatre. Near by, at the spot called Bir el Jebana, Père Delattre has discovered four cemeteries, one of which contains the tombs of state officials or servants of the imperial government. Rather more than half a mile north-west of Byrsa are the huge cisterns of La Malga, which, at the time of the Arab geographer, Idrīsī, still comprised twenty-four parallel covered reservoirs, 325 ft. by 71½ ft.; of these fourteen only remain.

On the hill of the Petit Séminaire, which is separated from Byrsa by a valley, Père Delattre has discovered a Christian basilica, the baths of Gargilius, large graves with several levels of tombs, and much débris of sculpture, which, however, is insufficient to enable us to say that this is the site of the temple of Tanit or Juno Caelestis. The quarter of Dermèche, near the sea, whose name recalls the Latin *Thermis* or *Thermas*, is remarkable for the imposing remains of the baths (*thermae*) of Antoninus. In one place called Douimés was the Ceramicus where excavation has discovered a graceful basilica, proto-Punic tombs, potters' ovens with numerous terra-cotta moulds which were abandoned after the siege in 146 B.C., and finally a Roman palace with superb marble statues. Farther on are huge reservoirs of Borj-Jedid which are sufficiently well-preserved to be used again.

Behind the small fort of Borj-Jedid is the plateau of the Odeum where the theatre and fine marble statues of the Roman period have been laid bare; beyond is the great Christian basilica of Damus-el-Karita (perhaps a corruption of *Domus Caritatis*); in the direction of Sidi-bu-Saïd is the *platea nova*, the huge stairway of which, like so many other Carthaginian buildings, has of late years been destroyed by the Arabs for use as building material; on the coast near St Monica is the necropolis of Rabs where Delattre dug up fine anthropoid sarcophagi of the Punic period.

In the quarter of Megara (Magaria, mod. La Marsa) it would seem that there never were

more than isolated buildings, villas in the midst of gardens. At Jebel Khaui (Cape Kamart) there is a great necropolis, the sepulchral chambers of which were long ago rifled by Arabs and Vandals. This cemetery had a Jewish quarter.

We must mention finally the gigantic remains in the western plain of the Roman aqueduct which carried water from Jebel Zaghwan (*Mons Zeugitanus*) and Juggar (Zucchara) to the cisterns of La Malga. From the *nymphaeum* of Zaghwan to Carthage this aqueduct is 61 Roman miles (about 56 English miles) long; in the plain of Manuba its arches are nearly 49 ft. high.

Though several famous travellers visited and described the ruins of Carthage during the first thirty years of the 19th century, such as Major Humbert, Chateaubriand, Estrup, no scientific investigations took place till 1833. In that year Captain Falbe, Danish consul at Tunis, made a plan of the ruins so far as they were visible. In 1837 there was formed in Paris, on the initiative of Dureau de la Malle, a *Société pour les fouilles de Carthage*; under the auspices of this body Falbe and Sir Grenville Temple undertook researches, and a little later Sir Thomas Read, English consul, following the example of the Genoese and the Pisans, carried away to England the mosaics, columns and statues of the baths of Antoninus. The Abbé Bourgade, chaplain of the church of St Louis erected in 1841, collected together Punic stelae and other antiquities from the surrounding plain; these formed the nucleus of the magnificent museum subsequently formed by Père Delattre at the instigation of Cardinal Lavigerie. Between 1856 and 1858 Nathan Davis made excavations on the supposed site of the Odeum, and in 1859 Beulé undertook his celebrated investigations on Byrsa. Among other explorers were A. Daux in 1866; von Maltzan in 1870; E. de Sainte-Marie in 1874; Ch. d'Hérisson in 1883; E. Babelon and S. Reinach in 1884; Vernaz in 1885; Gauckler in 1903. Of these the majority were sent officially by the French government. But their attempts were partial, disjointed and without any systematic plan; they were entirely superseded by the brilliant and persevering work of R.P. Delattre. The Musée Lavigerie, the result of his labours, contains a vast archaeological treasure, the interest of which is doubled by the fact that it stands in the very midst of the ancient site. Unfortunately Delattre's work suffered too often from the absence of a cordial understanding with the directors of the antiquities department, La Blanchère and P. Gauckler, who, having themselves undertaken excavations, transported their finds to the Bardo museum, by the help of the public funds at their disposal.

The main authority for the topography and the history of the excavations is Aug. Audollent's *Carthage romaine* (Paris, 1901). A topographical and archaeological map of the site was published under the direction of Colonel Dolot and with the assistance of Delattre and Gauckler by the Ministère de l'Instruction Publique in 1907.

History.—The history of Carthage falls into four periods: (1) from the foundation to the beginning of the wars with the Sicilian Greeks in 550 B.C.; (2) from 550 to 265, the first year of the Punic Wars; (3) the Punic Wars to the fall of Carthage in 146 B.C.; (4) the periods of Roman and Byzantine rule down to the destruction of the city by the Arabs in A.D. 698.

(1) *Foundation to 550 B.C.*—From an extremely remote period Phoenician sailors had visited the African coast and had had commercial relations with the Libyan tribes who inhabited the district which forms the modern Tunis. In the 16th century B.C. the Sidonians already had trading stations on the coast; with the object of competing with the Tyrian colony at Utica they established a trading station called Cambē or Caccabē on the very site afterwards occupied by Carthage. Near Borj-Jedid unmistakable traces of this early settlement have been found, though nothing is known of its history. According to the classical tradition Carthage was founded about 850 B.C. by Tyrian emigrants led by Elissa or Elissar, the daughter of the Tyrian king Mutton I., fleeing from the tyranny of her brother Pygmalion. According to the story, Elissa subsequently received the name of Dido, *i.e.* "the fugitive." Cambē welcomed the new arrivals, who bought from the mixed Libyo-Phoenician peoples of the neighbourhood, tributaries of the Libyan king Japon, a piece of land on which to build a "new city," *Kart-hadshat*, the Greek and Roman forms of the name. The story goes that Dido, having obtained "as much land as could be contained by the skin of an ox," proceeded to cut the skin of a slain ox into strips narrow enough to extend round the whole of the hill, which afterwards from this episode gained the name of *Byrsa*. This last detail obviously arose from a mere play on words by which Βύρσα "hide," "skin," is confused with the Phoenician *bosra, borsa*, "citadel," "fortress." In memory of its Tyrian origin, Carthage paid an annual tribute to the temple of Melkarth at Tyr, and under the Roman empire coins were struck showing Dido fleeing in a galley, or presiding over the building of Byrsa. On the Vatican *Virgil* there is a representation in miniature of workmen shaping marble blocks and columns for Dido's palace.

The early history of Carthage is very obscure. It is only in the 6th century that real history begins. By this time the city is unquestionably a considerable capital with a domain divided

into the three districts of Zeugitana (the environs of Carthage and the peninsula of C. Bon), Byzacium (the shore of the Syrtes), and the third comprising the emporia which stretch in the form of a crescent to the centre of the Great Syrtis as far as Cyrenaica. The first contest against the Greeks arose from a boundary question between the settlements of Carthage and those of the Greeks of Cyrene. The limits were eventually fixed and marked by a monument known as the "Altar of Philenae." The destruction of Tyre by Nebuchadrezzar (*q.v.*), in the first half of the 6th century, enabled Carthage to take its place as mistress of the Mediterranean. The Phoenician colonies founded by Tyre and Sidon in Sicily and Spain, threatened by the Greeks, sought help from Carthage, and from this period dates the Punic[2] supremacy in the western Mediterranean. The Greek colonization of Sicily was checked, while Carthage established herself on all the Sicilian coast and the neighbouring islands as far as the Balearic Islands and the coast of Spain. The inevitable conflict between Greece and Carthage broke out about 550.

(2) *Wars with the Greeks.*—In 550, the Carthaginians, led by the suffetes Malchus, conquered almost all Sicily and expelled the Greeks. In 536 they defeated the Phocaeans and the Massaliotes before Alalia on the Corsican coast. But Malchus, having failed in Sardinia, was banished by the stern Carthaginian senate and swore to avenge himself. He laid siege to Carthage itself, and, after having sacrificed his son Carthalo to his lust for vengeance, entered the city as a victor. He ruled until he was put to death by the party which had supported him. Mago, son of Hanno, succeeded Malchus, as suffetes and general-in-chief. He was the true founder of the Carthaginian military power. He conquered Sardinia and the Balearic Islands, where he founded Port Mahon (Portus Magonis), and so increased the power of Carthage that he was able to force commercial treaties upon the Etruscans, and the Greeks of both Sicily and Italy. The first agreement between Carthage and Rome was made in 509, one year after the expulsion of the Tarquins, in the consulship of Junius Brutus and Marcus Horatius. The text is preserved by Polybius (*Hist.* iii. 22-23). It assigned Italy to the Romans and the African waters to Carthage, but left Sicily as a dangerous neutral zone.

Mago was succeeded as commander-in-chief by his elder son Hasdrubal (c. 500), who was thrice chosen suffetes; he died in Sardinia about 485. His brother Hamilcar, having collected a fleet of 200 galleys for the conquest of Sicily, was defeated by the combined forces of Gelo of Syracuse and Theron of Agrigentum under the walls of Himera in 480, the year in which the Persian fleet was defeated at Salamis (some say the two battles were simultaneous); it is said that 150,000 Carthaginians were taken prisoners. The victory is celebrated by Pindar (*Pyth.* i.).

These two leaders of the powerful house of the Barcidae each left three sons. Those of Hasdrubal were Hannibal, Hasdrubal and Sapho; those of Hamilcar, Himilco, Hanno and Gisco. All, under various titles, succeeded to the authority which it had already enjoyed. About 460 Hanno,[3] passing beyond the Pillars of Hercules (Straits of Gibraltar), founded settlements along the West African coast in the modern Senegal and Guinea, and even in Madeira and the Canary Islands.

In Sicily the war lasted for a century with varying success. In 406 Hannibal and Himilco destroyed Agrigentum and threatened Gela, but the Carthaginians were forced back on their strongholds in the south-west by Dionysius the Elder, Dionysius the Younger, Timoleon and Agathocles successively, whose cause was aided by a terrible plague and civil troubles in Carthage itself, A certain Hanno, unquestionably of the Barcide house, attempted to seize the supreme power, but his partisans were overwhelmed and he himself suffered the most cruel punishment. Profiting by these troubles, Timoleon defeated the Carthaginians at Crimissus in 340, and compelled them to sue for peace. This peace was not of long duration; Agathocles crossed to Africa and besieged Carthage, which was then handicapped by the conspiracy of Bomilcar. Bomilcar was crucified, and Agathocles having been obliged to return to Sicily, his general Eumarcus was compelled to carry his army out of Africa, where it had maintained itself for three years (August 310 to October 307). After the death of Agathocles, the Carthaginians re-established their supremacy in Sicily, and Mago even offered assistance to Rome against the invasion of Pyrrhus (480). Pyrrhus crossed to Sicily in 277, and was preparing to emulate Agathocles by sailing to Africa when he was compelled to return to Italy (see Sicily: *History*).

Delivered from these dangers and more arrogant than before, Carthage claimed the monopoly of Mediterranean waters, and seized every foreign ship found between Sardinia and the Pillars of Hercules. "At Carthage," said Polybius, "no one is blamed, however he may have acquired his wealth." The sailors took the utmost care to conceal the routes which they followed; there is a story that a Carthaginian ship, pursued by a Roman galley as far as the Atlantic, preferred to be driven out of her course and sunk rather than reveal the course to

the Cassiterides, whither she was bound in quest of tin. The owner being saved, the senate made good his losses from the public treasury (Strabo, iii. 5. 11).

(3) *Wars with Rome.*[4]—The first Punic War lasted twenty-seven years (268-241); it was fought by Carthage for the defence of her Sicilian possessions and her supremacy in the Tyrrhenian Sea. The Romans, victorious at the naval battles of Mylae (Melazzo) and Ecnomus (260 and 256), sent M. Atilius Regulus with an army to Africa. But the Carthaginians, by the help of the Spartan Xanthippus, were successful, and Regulus was captured. The fighting was then transferred to Sicily, where Hasdrubal was defeated at Panormus (250); subsequently the Romans failed before Lilybaeum and were defeated at Drepanum, but their victory at the Aegates Islands ended the war (241). Carthage now desired to disband her forces, but the mercenaries claimed their arrears of pay, and on being refused revolted under Spendius and Matho, pillaged the suburbs of Carthage and laid siege to the city itself. Only the genius of Hamilcar Barca raised the siege; the mercenaries were caught in the defile of the Axe, where they were cut down without mercy. This war, which all but ruined Carthage, is known to the Roman historians as the *bellum inexpiabile.*

This peril averted, Carthage undertook the conquest of Spain. It was the work of Hamilcar, and lasted nine years up to the day of Hamilcar's death, sword in hand, in 228. His son-in-law, Hasdrubal Pulcher, built Carthagena in 227 and concluded with Rome a treaty by which the Ebro was adopted as the boundary of the Carthaginian sphere. On his death the soldiers chose for themselves as leader Hannibal, son of Hamilcar. At this period Carthage, with a population of perhaps 1,000,000, was in the enjoyment of extraordinary prosperity alike in its internal industries and in its foreign trade. The manufacture of woven goods, especially, was a flourishing industry; the Greek writer Polemo records a special treaty dealing with Carthaginian fabrics which were a recognized luxury throughout the ancient world. In Sicily, Italy and Greece the Carthaginians sold especially black slaves, ivory, metals, precious stones and all the products of Central Africa, which came thence by caravan. In Spain they sought copper and silver, and it was by them that the modern mines of Huelva, as also those of Osca and Carthagena, were first exploited. The district round Carthage, with its amazing fertility, was the granary of the city, as it was later that of Rome. Mago had drawn up a treaty dealing with agriculture and' rural economy generally, which was subsequently brought to Rome and translated into Latin by Decimus Silanus by order of the senate (J.P. Mahaffy, "The Work of Mago," in *Hermathena*, xv. pp. 29-35).

In the midst of this prosperity the Second War with Rome broke out. At this time the genius of Carthage is incarnate in Hannibal; his campaigns in Spain, Italy and Africa have won the admiration of military experts of all periods. The war became inevitable in 210 when Hannibal captured Saguntum, which was in alliance with Rome. Passing through Spain and Gaul, Hannibal resolved to carry the war into the heart of Italy (218-217). The battles of the Ticinus, Trebia and Trasimene Lake are but stages in the wonderful progress which culminated in the battle of Cannae (August 2, 216). The road to Rome was now open to him, but he did not profit by his advantage, while the Carthaginian senate, to its shame, withheld all further support. His brother Hasdrubal with his relieving army was defeated at the Metaurus in 207; the Romans recovered their hold in Spain, and, seeing that Hannibal was unable to move in Italy, carried the war back to Africa. Hearing that Scipio had taken Utica (203) and defeated Hasdrubal and Syphax, king of Numidia, Hannibal returned from Italy, but with a hastily levied army was defeated at Zama (October 19, 202). The subsequent peace was disastrous to Carthage, which lost its fleet and all save its African possessions.

After the Second War Carthage soon revived. The population is said still to have numbered 700,000, and despite its humiliation, the city never ceased to inspire alarm at Rome. The Numidian prince Massinissa, rival of Syphax and a Roman protégé, took advantage of a clause in the treaty of 202, which forbade Carthage to make war without the consent of the Roman senate, to extend his possessions at the expense of Carthage. In response to a protest from Carthage an embassy including M. Porcius Cato the Elder was sent to inquire into the matter, and Cato was so impressed with the city as a whole that on returning to Rome he never made a speech without concluding with the warning "Delenda est Carthago."

At this time there were three political parties in Carthage: (1) that which upheld the Roman alliance, (2) hat which advocated the Numidian alliance, and (3) the popular party. These three were led respectively by Hanno, Hannibal Passer, Hasdrubal and Carthalo. The popular faction, which was turbulent and exasperated by the bad faith of the Romans, expelled the Numidian party and declared war in 149 on Massinissa, who was victorious at Oroscope. Rome then intervened, determined finally to destroy her now enfeebled rival. War was declared on the pretext that Carthage had engaged in war with Massinissa without the sanction of Rome. The third Punic War lasted three years, and after a heroic resistance the

City fell in 146. The last champions of liberty entrenched themselves under Hasdrubal in the temple of Eshmun, the site of which is now occupied by the chapel of St Louis. The Roman troops were let loose to plunder and burn. The thick bed of cinders, blackened stones, broken glass, fragments of metal twisted by fire, half-calcined bones, which is found to-day at a depth of 13 to 16 ft. under the remains of Roman Carthage between Byrsa and the harbours, bears grim witness, in accord with the accounts of Polybius and Appian, to the terrible fate which overtook this part of the city. Before long a commission arrived from Rome to decide the fate of the province of Carthage. In the city itself, temples, houses and fortifications were levelled to the ground, the site was dedicated with solemn imprecations to the infernal gods, and all human habitation throughout the vast ruined area was expressly forbidden.

Constitutional History.—The narrative must here be interrupted by an account of the political and religious development of Phoenician Carthage. Carthage was an aristocratic republic based on wealth rather than on birth. Indeed, the popular party, which included certain noble families such as the Barcidae, was always powerful, and thus government by demagogues was not infrequent. So Aristotle, writing about 330, emphasizes the importance of great wealth in Carthaginian politics. The government was in fact a plutocracy. The aristocratic party was represented by the two suffetes and the senate; the democratic by the popular assembly. The suffetes (*Sofetim*) presided in the senate and controlled the civil administration; the office was annual, but there was no limit to re-election. Hannibal was elected for twenty-two years. The senate, which, like that of Tyre, was composed of 300 members, exercised ultimate control over all public affairs, decided on peace and war, nominated the Commission of Ten, which was charged with aiding and controlling the suffetes. This commission was subsequently replaced, by a council of one hundred, called by the Greeks *gerousia*. This tribunal, which maintained law and order and called the generals to account, gradually became a tyrannical inquisition. Frequently it met at night in the Temple of Eshmun On Byrsa, in secret sessions described by Aristotle as συσσίτια τῶν ἑταιριῶν.

The popular assembly was composed, not of all the citizens, but of the *timuchi* (Gr. τιμή, ἔχειν), *i.e.* those who possessed a certain property-qualification. The election of the suffetes had to be ratified by this assembly. The two bodies were almost always in opposition, and this was one of the chief causes of the ruin of Carthage.

The army was recruited externally by senators who were sent to the great *emporia* or trade-centres, even to the most remote, to contract with local princes for men and officers. The payments, agreed upon in this way, were frequently in arrears; hence the terrible revolts such as that of the “bellum inexpiabile.” It was not till the 3rd century that Carthage, in imitation of the kings of Syria and Egypt, began to make use of elephants in war. The elephant used was the African type (*elephas capensis*), which was smaller than the Asiatic (*elephas indicus*), though with longer ears. In addition to the mercenaries, the army contained a legion composed of young men belonging to the best families in the state; this force was important as a nursery of officers.

Religion.—The religion of Carthage was that of the Phoenicians. Over an army of minor deities (*alonim* and *baalim*) towered the trinity of great gods composed of Baal-Ammon or Moloch (identified by the Romans with Cronus or Saturn); Tanit, the virgin goddess of the heavens and the moon, the Phoenician Astarte, and known as Juno Caelestis in the Roman period; Eshmun, the protecting deity and protector of the acropolis, generally identified with Aesculapius. There were also special cults: of Iolaus or Tammuz-Adonis, whom the Romans identified to some extent with Mercury; of the god Patechus or Pygmaeus, a deformed and repulsive monster like the Egyptian Ptah, whose images were placed on the prows of ships to frighten the enemy; and lastly of the Tyrian Melkarth, whose functions were analogous to those of Hercules. The statue of this god was carried to Rome after the siege of 146 (Pliny, *Nat. Hist.* xxxvi. 12. 39). From inscriptions we know the names of other minor deities, which are perhaps only other names of the same gods, *e.g.* Rabbat Umma, “the great mother”; Baalat haedrat, “mistress of the sanctuary”; Ashtoreth (Astarte), Illat, Sakon, Tsaphon, Sid, Aris (? Ares).

From the close of the 4th century B.C. the intimate relations between the Carthaginians and the Sicilian Greeks began to introduce Hellenic elements into this religion. In the forum of Carthage was a temple to Apollo containing a colossal statue, which was transported to Rome. The Carthaginians once at least sent offerings to Delphi, and Tanit approximated to some extent to Demeter; hence on the coins we find the head of Tanit or the Punic Astarte crowned with ears of corn, in imitation of the coins of the Greek Sicilian colonies. The symbol of Tanit is the crescent moon; in her temple at Carthage was preserved a famous veil or *peplus* which was venerated as the city’s palladium. On the innumerable votive stelae which have been unearthed, we find invocations to Tanit and Baal-Ammon, as two associate deities (θεοὶ πάρεδροι). The usual formula in these inscriptions is, “To the great lady Tanit, the manifestation [reflex, face] of Baal (*Tanti-Penē-Baal*) and to our lord Baal-Ammon, the vow of

Bomilcar, son of Mago, son of Bomilcar, because they have heard his prayer" (*Corp. inscr. semit.* vol. i. pp. 276 f.; Audollent, *Carth. Rom.* p. 369).

Baal-Ammon or Moloch, the great god of all Libya, is represented as an old man with ram's horns on his forehead; the ram is frequently found with his statues. He appears also with a scythe in his hand ("*falcem ferens senex pingitur*." St Cyprian, *De idol. vanit.* 11). At Carthage children were sacrificed to him, and in his temple there was a colossal bronze statue in the arms of which were placed the children who were to be sacrificed (Diod. Sic. xx. 14; Justin xviii. 6, xix. 1; Plut. *De superstit.* 13, *De sera num. vindic.* 6.). The children slipped one by one from the arms into a furnace amid the plaudits of fanatical worshippers. These sacrifices persisted even under Roman rule; Tertullian states that even in his time they took place in secret (*Apolog.* cix.; cf. Delattre, "Inscript. de Carth.," in *Bulletin épigraphique*, iv. p. 317; Audollent, op. cit. p. 398).

(4) *Roman Period.*—In 122 B.C., twenty-four years after the destruction of the city by Scipio Aemilianus, the Roman senate, on the proposal of Rubrius, decided to plant a Latin colony on the site. C. Gracchus and Fulvius Flaccus were entrusted with the foundation of the new city, which was christened *Colonia Junonia*, and placed under the protection of Juno Caelestis, the new name for the Punic Tanit. But its prosperity was obstructed both by unpropitious omens and by the very recollection of the ancient feud, and fifty years later Marius, proscribed by Sulla, found the ruins practically deserted. In the neighbourhood were the scattered remnants of the old Punic population, who, according to Athenaeus (*Deipnosoph.* v. 50), had actually had the assurance to send ambassadors to Mithradates the Great assuring him of their support against Rome. Ultimately M. Minucius Rufus passed a law abrogating that of 122 and suppressing the *Colonia Junonia*.

Julius Caesar, pursuing the lost supporters of Pompey, encamped on the ruins of the city, and there, according to tradition, had a dream which induced him to re-establish the abandoned colony. Returning to Rome, he despatched thither the poor citizens who were demanding land from him. Later on Augustus sent new colonists, and, henceforward, the machinery of administration was regularly centred there (Appian viii. 136; Dio Cass. lxxx. 1; Audollent, op. cit. p. 46). The proconsuls of the African province had hitherto lived at Utica; in 14-13 B.C. C. Sentius Saturninus transferred his headquarters to Carthage, which was henceforth known as *Colonia Julia Carthago*. Several inscriptions use this name, as also the bronze coins which bear the heads of Augustus and Tiberius, and were struck at first in the name of the *suffetes*, afterwards in that of *duumviri*.

Pomponius Mela and Strabo already describe Carthage as among the greatest and most wealthy cities of the empire. Herodian puts it second to Rome, and such is the force of tradition that the Roman citizens resident in Carthage boasted of its Punic past, and loved to recall its glory. Virgil in the *Aeneid* celebrated the misfortunes of Dido, whom the colonists ultimately identified with Tanit-Astarte; a public Dido-cult grew up, and the citizens even pretended to have discovered the very house from which she had watched the departure of Aeneas. The religious character of these legends, coupled with the city's resumption of its old role as mistress of Africa, and its independent spirit, reawakened the old distrust, and even up to the invasions of the Vandals the jealous rivalry of Rome forbade the reconstruction of the city walls.

The revolt of L. Clodius Macer, legate of Numidia, in A.D. 68 was warmly supported by Carthage, and one of the coins of this short-lived power bears the symbol of Carthage personified. At the moment of the accession of Vitellius, Piso, governor of the province of Africa, was in his turn proclaimed emperor at Carthage. A little later, under Antoninus Pius, we read of a fire which devastated the quarter of the forum; about the same time, *i.e.* under Hadrian and Antoninus, there was built the famous Zaghwan aqueduct, which poured more than seven million gallons of water a day into the reservoirs of the Mapalia (La Malga); the cost of this gigantic work was defrayed by a special tax which pressed heavily on the inhabitants as late as the reign of Septimius Severus; allusions to it are made on the coin-types of this emperor (E. Babelon, *Revista italiana di numismatica*, 1903, p. 157).

In the early history of Christianity Carthage played an auspicious part, in virtue of the number of its disciples, the energy and learning of their leaders, the courage and eloquence of its teachers, the persecutions of which it was the scene, the number of its councils and the heresies of which it witnessed the birth, propagation or extinction (see CARTHAGE, SYNODS OF). The labours of Delattre have filled the St Louis museum at Carthage with memorials of the early Church. From the end of the 2nd century there was a bishop of Carthage; the first was Agrippinus, the second Optatus. At the head of the apologists, whom the persecutions inspired, stands Tertullian. In 202 or 203, in the amphitheatre, where Cardinal Lavigerie erected a cross in commemoration, occurred the martyrdom of Perpetua and Felicitas.

Tertullian was succeeded (248) by a no less famous bishop Cyprian. About this time the proconsul Gordian had himself proclaimed (239) emperor at Thysdrus (El Jem). Shortly afterwards Sabinianus, aspiring to the same dignity, was besieged by the procurator of Mauretania; the inhabitants gave him up and thus obtained a disgraceful pardon (R. Cagnat, *L'armée romaine d'Afrique* p. 52; Audollent, op. cit. p. 73). Peace being restored, the persecution of the Christians was renewed by an edict of the emperor Decius (250). Cyprian escaped by hiding, and subsequently caused the heresy of Novatian to be condemned in the council of 251. In 257, in a new persecution under Valerian, Cyprian was beheaded by the proconsul Galerius Maximus.

About 264 or 265 a certain Celsus proclaimed himself emperor at Carthage, but was quickly slain. Probus, like Hadrian and Severus, visited the city, and Maximian had new baths constructed. Under Constantius Chlorus, Maxentius proclaimed himself emperor in Africa; this caused great excitement in Carthage, and the garrison, which was hostile to the pretender, compelled L. Domitius Alexander to assume the purple. Domitius was, however, captured by Maxentius and strangled at Carthage. About 311 there arose the famous Donatist heresy, supported by 270 African bishops (see Donatists and Constantine I.). At the synod of Carthage in 411 this heresy was condemned owing to the eloquence of Augustine. Two years later the Carthaginian sectaries even ventured upon a political rebellion under the leadership of Heraclianus, who proclaimed himself emperor and actually dared to make a descent on Italy itself, leaving his son-in-law Sabinus in command at Carthage. Being defeated he fled precipitately to Carthage, where he was put to death (413). Donatism was followed by Pelagianism (see Pelagius), also of Carthaginian origin, and these religious troubles were not settled when in May 429 the Vandals, on the appeal of Count Boniface, governor of Africa, crossed the Straits of Gibraltar and invaded Mauretania. Genseric, who was hailed with one accord by all the different sectaries as the champion of their several views, appeared in 439 before the walls of Carthage, which had been hastily rebuilt after five hundred years by the order of Theodosius II. The priest Salvianus has left a splendid picture of Carthage at this moment (*de Gubern.* vii. 16). It had 500,000 inhabitants, and 22 basilicas (several of which have been discovered by Delattre). Genseric entered almost without a blow (October 19, 439), and gave over the city to plunder before departing for his attack on Italy. From this time Carthage became, in the hands of the Vandals, a mere pirate stronghold, such as Tunis and Algiers were subsequently to become. Once, in 470, the fleet of the Eastern empire under the orders of Basiliscus appeared in the Bay of Carthage, but Genseric succeeded in setting fire to the attacking ships and from Byrsa watched their entire annihilation.

Byzantine Rule.—Under Genseric's successors (see Vandals), Carthage was still the scene of many displays of savage brutality, though Thrasamund built new baths and a basilica. Ultimately Gelimer, the last Vandal king, was defeated at Ad Decimum by the Byzantine army under Belisarius, who entered Carthage unopposed (September 14, 533). The restored city now received the name of Colonia Justiniana Carthago; Belisarius rebuilt the walls and entrusted the government to Solomon. New basilicas and other monuments were erected, and Byzantine Carthage recovered for a century the prosperity of the Roman city.

At length the Arabs, having conquered Cyrenaica and Tripolitana (647), and founded Kairawan (670), arrived before Carthage. In 697 Hasan ibn en-Noman, the Gassanid governor of Egypt, captured the city almost without resistance. But the garrison left by the Arabs was quite unable to defend itself against the patrician Joannes, who retook the city and hastily put it in a state of defence. Hasan returned furious with anger, defeated the Byzantines again, and decreed the entire destruction of the city. His orders were fulfilled; and in 698 Carthage finally disappears from history. Once again only does the name appear in the middle ages, when the French king, Louis IX., at the head of the eighth crusade, disembarked there on the 17th of July 1270. He died, however, of the plague on the 25th of August without having recovered northern Africa for civilization.

Bibliography.—I. *Ancient*.—(*a*) Polybius, Diodorus Siculus, Livy, Appian, Justin, Strabo; (*b*) for the Christian period, Tertullian, Cyprian, Augustine; (*c*) for the Byzantine and Vandal, Procopius and Victor de Vita. All the references to the topography of Roman and Byzantine Carthage are collected in Audollent, *Carthage romaine* (1901), pp. 775-825, which also contains a full list of modern works (pp. 13-32. and p. 835).

II. *Modern*.—The most important are: Falbe, *Recherches sur l'emplacement de Carthage* (Paris, 1833); Dureau de la Malle, *Topographie de Carthage* (Paris, 1835); Nathan Davis, *Carthage and her Remains* (London, 1861); Beulé, *Fouilles à Carthage* (Paris, 1861); Victor Guérin, *Voyage archéologique dans la régence de Tunis* (Paris, 1862); E. de Sainte Marie, *Mission à Carthage* (Paris, 1884); C. Tissot, *Géographie comparée de la province romaine d'Afrique* (Paris, 1884-1888, 2 vols.); E. Babelon, *Carthage* (Paris, 1896); Otto Meltzer,

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(E. B.*)

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1 The whole question of these harbours has been fully discussed by Cecil Torr, Otto Meltzer, R. Öhler, S. Gsell, M. de Roquefeuil; see Aug. Audollent, *Carthage romaine*, pp. 198 seq.; *Revue archéol.* 3rd series, xxiv.; *Jahrbüch f. class. Philologie*, vols. cxlvii., cxlix.; also *Classical Review*, vols. v., vii., viii.

2 *i.e.* "of the Poeni (Phoenicians)."

3 The identification of this Hanno with the son of Hamilcar is conjectural; see Hanno.

4 For the military side of these wars see Punic Wars; Hannibal; Hasdrubal.

CARTHAGE, a city and the county-seat of Jasper county, Missouri, U.S.A., on the Spring river, about 950 ft. above sea-level, and about 150 m. S. by E. of Kansas City. Pop. (1890) 7981; (1900) 9416, of whom 539 were negroes; (1910 census) 9483. It is served by the St. Louis & San Francisco, the Missouri Pacific, and the St. Louis, Iron Mountain & Southern railways, and is connected with Webb City and Joplin, Mo., and Galena, Kan., by the electric line of the Southwest Missouri railway. The town is built on high ground underlain by solid limestone, and has much natural and architectural beauty. It is the seat of the Carthage Collegiate Institute (Presbyterian). A Chautauqua assembly and a county fair are held annually. In the vicinity there are valuable lead, zinc and coal mines, and quarries of Carthage "marble," with which the county court house is built. Carthage is a jobbing centre for a fruit and grain producing region; live-stock (especially harness horses) is raised in the vicinity; and among the city's manufactures are lime, flour, canned fruits, furniture, bed springs and mattresses, mining and quarrying machinery, ploughs and woollen goods. In 1905 the factory products were valued at $1,179,661. Natural gas for domestic use and for factories is piped from the Kansas gas fields. The municipality owns and operates the electric-lighting plant. Carthage, founded in 1833, was laid out as a town and became the county-seat in 1842, was incorporated as a town in 1868, was chartered as a city in 1873, and in 1890 became a city of the third class under the general (state) law. On the 5th of July 1861 about 3500 Confederates under General James E. Rains and M.M. Parsons, accompanied by Governor Claiborne Fox Jackson (1807-1862), and 1500 Union troops under Colonel Franz Sigel, were engaged about 7 m. north of the city in an indecisive skirmish which has been named the battle of Carthage.

CARTHAGE, SYNODS OF. During the 3rd, 4th, and 5th centuries the town of Carthage (*q.v.*) in Africa served as the meeting-place of a large number of church synods, of which, however, only the most important can be treated here.

1. In May 251 a synod, assembled under the presidency of Cyprian to consider the treatment of the *lapsi* (those who had fallen away from the faith during persecution), excommunicated Felicissimus and five other Novatian bishops (Rigorists), and declared that

the *lapsi* should be dealt with, not with indiscriminate severity, but according to the degree of individual guilt. These decisions were confirmed by a synod of Rome in the autumn of the same year. Other Carthaginian synods concerning the *lapsi* were held in 252 and 254.

See Hefele, 2nd ed., i. pp. 111 sqq. (English translation, i. pp. 93 sqq.); Mansi, i. pp. 863 sqq., 905 sqq.; Hardouin, i. pp. 133 sqq., 147 sqq.; Cyprian, *Epp.* 52, 54, 55, 68.

2. Two synods, in 255 and 256, held under Cyprian, pronounced against the validity of heretical baptism, thus taking direct issue with Stephen, bishop of Rome, who promptly repudiated them, and separated himself from the African Church. A third synod, September 256, unanimously reaffirmed the position of the other two. Stephen's pretensions to authority as "bishop of bishops" were sharply resented, and for some time the relations of the Roman and African Churches were severely strained.

See Hefele, 2nd ed., i. pp. 117-119 (English translation, i. pp. 99 sqq.); Mansi, i. pp. 921 sqq., 951 sqq.; Hardouin, i. pp. 153 sqq.; Cyprian, *Epp.* 69-75.

3. The Donatist schism (see DONATISTS) occasioned a number of important synods. About 348 a synod of Catholic bishops, who had met to record their gratitude for the effective official repression of the "Circumcelliones" (Donatist terrorists), declared against the rebaptism of any one who had been baptized in the name of the Trinity, and adopted twelve canons of clerical discipline.

See Hefele, 2nd. ed., i. pp. 632-633 (English translation, ii. pp. 184-186); Mansi, iii. pp. 143 sqq.; Hardouin, i. pp. 683 sqq.

4. The "Conference of Carthage" (see DONATISTS), held by imperial command in 411 with a view to terminating the Donatist schism, while not strictly a synod, was nevertheless one of the most important assemblies in the history of the African church, and, indeed of the whole Christian church.

See Hefele, 2nd ed., ii. pp. 103-104 (English translation, ii. pp. 445-446); Mansi, iv. pp. 7-283; Hardouin, i. pp. 1043-1190.

5. On the 1st of May 418 a great synod ("A Council of Africa," St Augustine calls it), which assembled under the presidency of Aurelius, bishop of Carthage, to take action concerning the errors of Caelestius, a disciple of Pelagius (*q.v.*), denounced the Pelagian doctrines of human nature, original sin, grace and perfectibility, and fully approved the contrary views of Augustine. Prompted by the reinstatement by the bishop of Rome of a deposed African priest, the synod enacted that "whoever appeals to a court on the other side of the sea (meaning Rome) may not again be received into communion by any one in Africa" (canon 17).

See Hefele, 2nd ed., ii. pp. 116 sqq. (English translation, ii. pp. 458 sqq.); Mansi, iii. pp. 810 sqq., iv. pp. 377 sqq., 451 sqq.; Hardouin, i. pp. 926 sqq.

6. The question of appeals to Rome occasioned two synods, one in 419, the other in 424. The latter addressed a letter to the bishop of Rome, Celestine, protesting against his claim to appellate jurisdiction, and urgently requesting the immediate recall of his legate, and advising him to send no more judges to Africa. 432

See Hefele, 2nd ed., ii. pp. 120 sqq., 137 sqq. (English translation, ii. pp. 462 sqq., 480 sqq.); Mansi, iii. pp. 835 sqq., iv. pp. 401 sqq., 477 sqq.; Hardouin, i. pp. 943 sqq., 1241 sqq.

(T. F. C.)

CARTHUSIANS, an order of monks founded by St Bruno (*q.v.*). In 1084 Bruno and his six companions presented themselves before the bishop of Grenoble and explained to him their desire to lead an ascetical life in a solitary place. He pointed out to them a desolate spot named Chartreuse, on the mountains near Grenoble, rocky and precipitous, and snow-covered during a great portion of the year, and told them they might there carry out their design. They built themselves three huts and an oratory, and gave themselves up to a life of prayer and silence and extreme austerity. After a few years Bruno was summoned to Rome by Urban II., as an adviser in the government of the Church, c. 1090; but after a year or so he obtained permission to withdraw from Rome, and was able to found in the forests of Calabria near Squillace a second, and later on a third and a fourth monastery, on the same lines as the Chartreuse. On one of these south Italian foundations Bruno died in 1101. On leaving the Chartreuse he had appointed a successor as superior, and the institute steadily took more

settled shape and further development. Peter the Venerable, abbot of Cluny, writing about forty years later, speaks thus of the mode of life of the earliest Carthusians:—

> "Warned by the negligence and lukewarmness of many of the older monks, they adopted for themselves and for their followers greater precaution against the artifices of the Evil One. As remedy against pride and vain-glory they chose a dress more poor and contemptible than that of any other religious body; so that it is horrible to look on these garments, so short, scanty, coarse and dirty are they. In order to cut up avarice by the roots, they enclosed around their cells a certain quantity of land, more or less, according to the fertility of the district; and they would not accept a foot of land beyond that limit if you were to offer them the whole world. For the same motive they limit the quantity of their cattle, oxen, asses, sheep and goats. And in order that they might have no motive for augmenting their possessions, either of land or animals, they ordained that in every one of their monasteries there should be no more than twelve monks, with their prior the thirteenth, eighteen lay brothers and a few paid servants. To mortify the flesh they always wear hair shirts of the severest kind, and their fasting is wellnigh continuous. They always eat bread of unbolted meal, and take so much water with their wine that it has hardly any flavour of wine left. They never eat meat, whether in health or ill. They never buy fish, but they accept it if it is given to them for charity. They may eat cheese and eggs only on Sundays and Thursdays. On Tuesdays and Saturdays they eat cooked vegetables. On Mondays, Wednesdays and Fridays they take only bread and water. They eat once a day only, save during the octaves of Christmas, Easter, Pentecost, Epiphany and other solemnities. They live in separate little houses like the ancient monks of Egypt, and they occupy themselves continually with reading, prayer and the labour of their hands, especially the writing of books. They recite the prayers for minor canonical hours in their own dwellings, when warned by the bell of the church; but they all assemble in church for matins and vespers. On feast days they eat twice, and sing all the offices in the church, and eat in the refectory. They do not say mass save on festivals and Sundays. They boil the vegetables served out to them in their own dwellings, and never drink wine save with their food." (Migne, *Patrol. Lat.* clxxxix. 943.)

In its broad outlines this description of primitive Carthusian life has remained true, even to the present day: the regulations as to food are not quite so stringent, and the habit is now an ordinary religious habit of white serge. It was not until 1170 that the Carthusians were formally constituted a separate religious order by papal act. Owing to its very nature, the institute never had any great expansion: at the middle of the 13th century there were some 50 Charterhouses; at the beginning of the 18th there were 170, 75 being in France.

There was no written rule before 1130, when Guigo, the fifth prior of the Grande Chartreuse, reduced to writing the body of customs that had been the basis of Carthusian life (Migne, *Patrol. Lat.* cliii. 631); enlargements and modifications of this code were made in 1259, 1367, 1509 and 1681: this last form of the statutes is the present Carthusian rule.

The life is very nearly eremitical: except on Sundays and feasts, the Carthusians meet only three times a day in the church—for the Midnight Office, for Mass and for Vespers; once a week, on Sundays (and feasts) they have their meal in the refectory, and once a week they have recreation together and a walk outside enclosure. All the rest of their time is passed in solitude in their hermitages, which are built quite separate from one another. Each hermitage is a house, containing living-room, bedroom and oratory, workshop and store-room, and has a small garden attached. The monks are supplied with such tools as they wish to employ in workshop and garden, and with such books as they need from the library. The Carthusian goes to bed every evening at 7 and is called about 11, when he says in his private oratory the *Officium B. Mariae Virginis*. Towards midnight all repair to the church for Matins and Lauds, which are celebrated with extraordinary solemnity and prolixity, so as to last from 2 to 3 hours, according to the office. They then return to bed until 5, when they again go to the church for the daily High Mass, still celebrated according to the phase of liturgical and ritual development of the 11th century. The private Masses are then said, and the monks betake themselves to work or study. At 10 in summer, 11 in winter, 12 on feast days, they have their dinner, alone except on Sundays and feasts; the dinner is supplied from the common kitchen through a small window. On many days of the year there is but one meal; meat is never eaten, even in sickness—this has always been an absolute rule among the Carthusians. In the afternoon they again assemble in the church for Vespers; the lesser portions of the canonical office, as well as the Office of the Blessed Virgin and the Office of the Dead, are said privately in the oratories.

This manner of life has been kept up almost without variation for eight centuries: among the Carthusians there have never been any of those revivals and reforms that are so striking a feature in the history of other orders—"never reformed, because never deformed." The Carthusians have always lived thus wholly cut off from the outer world, each one in almost

entire isolation. They introduced and have kept up in western Europe a life resembling that of the early Egyptian monks, as under St Anthony's guidance monasticism passed from the utter individualism of the first hermits to the half eremitical, half cenobitical life of the Lauras (see MONASTICISM). Owing to certain resemblances in external matters to the Benedictine rule and practice, the Carthusians have sometimes been regarded as one of the offshoots from the Benedictines; but this view is not tenable, the whole Carthusian conception, idea and spirit being quite different from the Benedictine.

The superiors of the Charterhouses are priors, not abbots, and the prior of the Grande Chartreuse is the superior general of the order. A general chapter of the priors is held annually at the Grande Chartreuse. The Carthusians have always flourished most in France, but they had houses all over western Europe; some of the Italian *Certose*, as those at Pavia, Florence and Naples, are renowned for their wonderful beauty.

The first English Charterhouse was established in 1178 at Witham by Selwood Forest, and at the Dissolution there were nine, the most celebrated being those at Sheen in Surrey and at Smithfield in London (for list see *Catholic Dictionary*, art. "Carthusians"). The Carthusians were the only order that made any corporate resistance to the ecclesiastical policy of Henry VIII. The community of the London Charterhouse stood firm, and the prior and several of the monks were put to death in 1535 under circumstances of barbarous cruelty. In Mary's reign a community was reassembled at Sheen, and on her death it emigrated, fifteen in number, to Flanders, and finally settled in Nieuport; it maintained itself as an English community for a considerable time, but gradually dwindled, and the last of the old English Carthusian stock died in 1831. There is now one Charterhouse in England established at Parkminster in Sussex in 1883; the community numbers 50 choir-monks, but it is almost wholly made up of foreigners, including many of those recently expelled from France.

At the French Revolution the monks were driven from the Grande Chartreuse, but they returned in 1816; they were again driven out under the Association Laws of 1901, and the community of the Grande Chartreuse is now settled in an old Certosa near Lucca. Of late years the community at the Grande Chartreuse had consisted of some 40 choir-monks and 20 lay brothers. Before the recent expulsions from France there were in all some 20 Charterhouses. 433

There have been since the middle of the 13th century a very few convents of Carthusian nuns, not more than ten; in recent times there have been but two or three, one situated a few miles from the Grande Chartreuse. The rule resembles that of the monks, but the isolation, solitude and silence are much less stringent. The habit of the Carthusians, both monks and nuns, is white.

A word may be added as to the famous liqueur, known as Chartreuse, made by the monks. At the Revolution the property of the Carthusians was confiscated, and on their restoration they recovered only the barren desert in which the monastery stood, and for it they had to pay rent. Thus they were for some years in want even of the needful means of subsistence. Then the liqueur was invented as a means of supplying the wants of the community; it became a great commercial success and produces a large yearly income. This income the monks have not spent on themselves, nor does it accumulate. The first charge is the maintenance of the Grande Chartreuse and the other Charterhouses, and out of it have been built and established the new monasteries of the order, as at Düsseldorf, Parkminster and elsewhere; but by far the largest portion has been spent on religious and charitable purposes in France and all over the world,—churches, schools, hospitals, almshouses, foreign missions. One thing is certain: the profits made no difference at all to the secluded and austere life of the monks of the Grande Chartreuse.

AUTHORITIES.—The most comprehensive historical work on the Carthusian order is B. Tromby, *Storia del patriarca S. Brunone e del suo ordine* (10 vols., 1773). References to other histories, old and new, will be found in Max Heimbucher, *Orden u. Kongregationen* (1896), i. § 36; Wetzer und Welte, *Kirchenlexicon* (ed. 2), art. "Karthäuserorden"; Herzog-Hauck, *Realencyklopadie* (ed. 3), art. "Karthäuser." For the English Carthusians, see E. Margaret Thompson, *Somerset Carthusians* (1895), and Dom L. Hendriks, *London Charterhouse* (1889). The best study on St Bruno and the foundation of the order is Hermann Löbbel, "Der Stifter des Karthäuser-Ordens," 1899 (vol. v. No. 1 of *Kirchengeschichtliche Studien*, Munster); and the best account of the actual life is by Algar Thorold (*Dublin Review*, April 1892), who spent some months in the noviciate at the Grande Chartreuse. A little tract (anonymous) translated from French, *The Carthusians*, 1902 (Orphans Press, Buckley Hall, Rochdale), gives precise information on the history, spirit and life of the Carthusians.

(E. C. B.)

CARTIER, SIR GEORGES ÉTIENNE, Bart. (1814-1873), Canadian statesman, was born in the province of Quebec on the 6th of September 1814. Called to the bar in 1835, he soon gained a large practice. He took part in the rebellion of 1837, and was forced for a time to fly the country. In 1848 he was elected to the Canadian parliament. His youthful ebullition of 1837 was soon repented of, and he became a loyal subject of the British crown. So greatly had he changed that in 1854 he became a leading member of the reconstructed Liberal-Conservative party. In 1855 he was appointed provincial secretary, and in 1857 attorney-general for Lower Canada. From 1858 to 1862 he and Sir John Macdonald were joint prime ministers of Canada, and their alliance lasted till the death of Cartier. He took the chief part in promoting many useful measures, such as the abolition of seigneurial tenure in Lower Canada (see QUEBEC), and the codification of the civil law of that province (1857-1864). Above all he favoured the construction of railways, and to his energy and fearless, optimism are largely due the eventual success of the Grand Trunk railway, and the resolve to construct the Canadian Pacific. In the face of great opposition, he carried his native province into federation (1864-1867), which would have been impossible without his aid. In the first cabinet of Sir John Macdonald he sat as minister of militia and defence, and carried in 1868 an important act establishing the land forces of Canada on a sound basis. Though a devout Catholic, he became involved in a political quarrel with his church, and was defeated by clerical influence at the general election of 1872. Another seat was found for him, but his health failed and he died on the 20th of May 1873.

The *Life*, by Alfred O. De Celles (Toronto, 1904), may be supplemented by the sketch in Dent's *Canadian Portrait Gallery* (Toronto, 1880).

(W. L. G.)

CARTIER, JACQUES (1491-1557), French navigator, discoverer of the Canadian river St Lawrence, was born at St Malo in Brittany. Of his early life nothing is known. On the suppression by Admiral Chabot of the trade to Brazil, an expedition consisting of two ships and sixty-one men was despatched from St Malo under Cartier on the 20th of April 1534, to look for a north-west passage to the East. Cartier reached Newfoundland on the 10th of May, and at once entered the strait of Belle Isle, then known to the fishermen as the bay of Castles. While the ships renewed their supply of wood and water in Belles Amours harbour on the north side of the strait, the long-boats discovered that the coast farther west was barren, rocky and uninviting. In view of this Cartier set sail on Monday, the 15th of June, for the south side of the strait, by following which he was led down almost the whole west coast of Newfoundland. Off St George's Bay a storm drove the ships out into the gulf, but on resuming his course Cartier fell in with the Bird Rocks. The island south of these he named Brion Island, after Chabot. Cartier mistook our Magdalen and Prince Edward Islands for the main shore on the south side of this inland sea. Following the coast of New Brunswick northward he was greatly disappointed to discover Chaleur Bay was not a strait. During a ten days' stay in Gaspé Harbour Cartier made friends with a tribe of Huron-Iroquois Indians from Quebec, two of whom he carried off with him. A mirage deceived him into thinking the passage up the river south of Anticosti was a bay, whereupon he proceeded to coast the southern, eastern and northern shores of Anticosti. On discovering the passage between this island and the Quebec shore a council was held, at which it was decided to postpone the exploration of this strait until the following year. Heading eastward along the Quebec shore, Cartier soon regained the Strait of Belle Isle and, entering the Atlantic on the 15th of August, reached St Malo in safety on the 5th of September.

Cartier set sail again from St Malo with three vessels on the 16th of May 1536, and passing through the strait of Belle Isle anchored on the 9th of August in Pillage Bay, opposite Anticosti. The next day he named this the bay of St Lawrence. In course of time the name spread to the gulf and finally to the river. Proceeding through the passage north of Anticosti, Cartier anchored on the 1st of September at the mouth of the Saguenay, which the two Indians who had passed the winter in France informed him was the name of a kingdom "rich and wealthy in precious stones." Again on reaching the island of Orleans, so named after the third son of Francis I., they told Cartier he was now in the kingdom of Canada, in reality the Huron-Iroquois word for village. Leaving his two larger vessels in the St Charles, which there enters the St Lawrence, Cartier set off westward with the bark and the long-boats. The former grounded in Lake St Peter, but in the latter he reached, on the 2nd of October, the Huron-Iroquois village of Hochelaga on the site of the city of Montreal. Further progress was

checked by the Lachine Rapid. From the top of Mount Royal, a name still in use, Cartier beheld the St Lawrence and the Ottawa stretching away to the west. On his return to the St Charles, where during the winter twenty-five men died of scurvy, Cartier sought further information about the rich country called Saguenay, which he was informed could be reached more easily by way of the Ottawa. In order to give Francis I. authentic information of this northern Mexico, Cartier seized the chief and eleven of the headmen of the village and carried them off to France. This time he passed south of Anticosti and, entering the Atlantic through Cabot Strait, reached St Malo on the 16th of July 1537.

Francis I. was unable to do anything further until the spring of 1541, when Cartier set sail with five vessels and took up his quarters at Cap Rouge, 9 m. above Quebec. A soldier, the seigneur de Roberval, had been chosen to lead the men to the conquest of Saguenay; but when he did not arrive, Cartier made a fresh examination of the rapid of Lachine, preparatory to sending the men up the river Ottawa. Roberval at length set sail in April 1542, but on reaching St John's, Newfoundland, met Cartier on his way back to France. In the summer of 1543, Cartier was sent out to bring home Roberval, whose attempt to make his way up the Ottawa to this mythical Saguenay had proved futile. From 1544 until his death at St Malo, on the 1st of September 1557, Cartier appears to have done little else than give technical advice in nautical matters and act as Portuguese interpreter. 434

A critical edition of Cartier's *Brief Récit de la navigation faicte ès isles de Canada* (1545), from the MSS., has been published by the university of Toronto. The best English version is that by James Phinney Baxter, published at Portland, Maine, in 1906.

(H. P. B.)

CARTILAGE (Lat. *cartilago*, gristle), the firm elastic and gristly connective tissue in vertebrates. (See Connective Tissues and Joints.)

CARTOON (Ital. *cartone*, pasteboard), a term used in pictorial art in two senses, (1) In painting, a cartoon is used as a model for a large picture in fresco, oil or tapestry, or for statuary. It was also formerly employed in glass and mosaic work. When cartoons are used in fresco-painting, the back of the design is covered with black-lead or other colouring matter; and, this side of the picture being applied to the wall, the artist passes over the lines of the design with a point, and thus obtains an impression. According to another method the outlines of the figures are pricked with a needle, and the cartoon, being placed against the wall, is "pounced," *i.e.* a bag of black colouring-matter is drawn over the perforations, and the outlines are thus transferred to the wall. In fresco-painting, the portions of the cartoon containing figures were formerly cut out and fixed (generally in successive sections) upon the moist plaster. Their contour was then traced with a pointed instrument, and the outlines appeared lightly incised upon the plaster after the portion of the cartoon was withdrawn. In the manufacture of tapestries upon which it is wished to give a representation of the figures of cartoons, these figures are sometimes cut out, and laid behind or under the woof, to guide the operations of the artist. In this case the cartoons are coloured.

Cartoons have been executed by some of the most distinguished masters; the greatest extant performances in this line of art are those of Raphael. They are seven in number, coloured in distemper; and at present they adorn the Victoria and Albert Museum, in South Kensington, having been removed thither from their former home, the palace of Hampton Court. With respect to their merits, they count among the best of Raphael's productions; Lanzi even pronounces them to be in beauty superior to anything else the world has ever seen. Not that they all present features of perfect loveliness, and limbs of faultless symmetry, —this is far from being the case; but in harmony of design, in the universal adaptation of means to one great end, and in the grasp of soul which they display, they stand among the foremost works of the designing art. The history of these cartoons is curious. Leo X. employed Raphael in designing (in 1515-1516) a series of Scriptural subjects, which were first to be finished in cartoons, and then to be imitated in tapestry by Flemish artists, and used for the decoration of the Sistine Chapel. Two principal sets of tapestries were

accordingly executed at Arras in Flanders; but it is supposed that neither Leo nor Raphael lived to see them. The set which went to Rome was twice carried away by invaders, first in 1527 and afterwards in 1798. In the first instance they were restored in a perfect state; but after their return in 1814 one was wanting—the cupidity of a Genoese having induced him to destroy it for the sake of the precious metal which it contained. Authorities differ as to the original number of cartoons, but there appear to have been twenty-five,—some by Raphael himself, assisted by Gianfrancesco Penni, others by the surviving pupils of Raphael. The cartoons after which the tapestries were woven were not, it would seem, restored to Rome, but remained as lumber about the manufactory in Arras till after the revolution of the Low Countries, when seven of them which had escaped destruction were purchased by Charles I., on the recommendation of Rubens. They were found much injured, "holes being pricked in them for the weavers to pounce the outlines, and in other parts they were almost cut through by tracing." It has never been ascertained what became of the other cartoons. Three tapestries, the cartoons of which by Raphael no longer exist, are in the Vatican,—representing the stoning of St Stephen, the conversion of St Paul, and St Paul in prison at Philippi.

Besides the cartoons of Raphael, two, to which an extraordinary celebrity in art-history attaches, were those executed in competition by Leonardo da Vinci and by Michelangelo—the former named the Battle of the Standard, and the latter the Cartoon of Pisa—soldiers bathing, surprised by the approach of the enemy. Both these great works have perished, but the general design of them has been preserved. In recent times some of the most eminent designers of cartoons have been masters of the German school,—Cornelius, Kaulbach, Steinle, Fuhrich, &c.; indeed, as a general rule, these artists appear to greater advantage in their cartoons than in the completed paintings of the same compositions. In England cartoon-work developed considerably in 1843 and 1844, when a competition was held for the decoration of the new Houses of Parliament. Dyce and Maclise left examples of uncommon mark in this line. The cartoon by Fred. Walker, A.R.A., made to advertise the dramatic version of Wilkie Collins's *Woman in White*, is now at the Tate Gallery; and cartoons by Ford Madox Brown are in the Victoria and Albert Museum, South Kensington.

(W. M. R.)

(2) "Cartoon" is also a term now applied to the large political drawings in the humorous or satirical papers of the day. At an earlier period satirical prints were styled "caricatures," and were issued separately. Gillray, Rowlandson, the three Cruikshanks, Heath and others were popular favourites in this class of design. Even the insignificant little cuts by Robert Seymour in *Figaro in London*, the *diableries* in *The Fly*, and the vulgar and rancorous political skits identified with the flood of scurrilous little papers of the time, were dignified by the same term. The long series of *Political Sketches* by "H.B." (John Doyle) were the first examples of unexaggerated statement, and fair and decorous satire. With the advent of *Punch* and its various rivals (*The Peep-Show, The Great Gun, Diogenes* and the like), the general tone was elevated. *Punch* at first adopted the word "pencilling" to describe the "big cut," which dealt variously with political and social topics. But when in 1843 there was held in Westminster Hall the great exhibition of "cartoons" from which selection was to be made of designs for the decoration in fresco of the new Houses of Parliament, *Punch* jocularly professed to range himself alongside the great artists of the day; so that the "mad designe" of the reign of Charles I. became the "cartoon" of that of Queen Victoria. John Leech's drawing in No. 105 of that journal was the first caricature to be called a cartoon: it was entitled "Substance and Shadow: the Poor ask for Bread, and the Philanthropy of the State accords—an Exhibition." Later, *Punch* dropped the word for a while, but the public took it up. Yet the *New English Dictionary* curiously attributes the first use of it to Miss Braddon in 1863.

In England the cartoon, no longer a weapon of venomous attack, has come to be regarded as a humorous or sarcastic comment upon the topic uppermost in the nation's mind, a witty or saturnine illustration of views already formed, rather than as an instrument for the manufacture of public opinion. It has almost wholly lost its rancour; it has totally lost its ferocity—the evolutionary result of peace and contentment, for satire in its more violent and more spontaneous form is but the outcome of the dissatisfaction or the rage of the multitude. The cartoon, it is agreed, must be suggestive; it must present a clear idea lucidly and, if possible, laughably worked out; and, however reserved or restrained it may be, or even, when occasion demands (as in the case of Sir John Tenniel and some of his imitators), however epic in intuition, it must always figure, so to say, as a leading article transformed into a picture. (See Caricature and Illustration.)

(M. H. S.)

CARTOUCHE (a French word adapted from the Ital. *cartoccio,* a roll of paper, Med Lat. *carta*, for *charta*, paper), originally a roll of paper, parchment or other material, containing the charge of powder and shot for a firearm, a cartridge (*q.v.*), which itself is a corruption of cartouche. The term was applied in architecture to various forms of ornamentation taking the shape of a scroll, such as the volute of an Ionian capital. It was particularly used of a sculptured tablet in the shape of a partly unrolled scroll on which could be placed an inscription or device. Such “cartouches” are used for titles, &c., on engravings of maps, plans, and the like. The arms of the popes and ecclesiastics of high birth were borne on an oval cartouche; and it is thus particularly applied, in Egyptian archaeology, for the oblong device with oval ends, enclosing the names of royal personages on the monuments. It is properly an oval formed by a rope knotted at one end. An amulet of similar shape, as the symbol of the “name,” was worn by men and women as a protection against the blotting out of the name after death.

CARTRIDGE (corruption of Fr. *cartouche*), a case, of brass or other metal, cardboard, silk, flannel, &c., containing an explosive charge, and usually the projectile also, for small arms and ordnance (see AMMUNITION).

CARTWRIGHT, EDMUND (1743-1823), English inventor, younger brother of Major John Cartwright (*q.v.*), was born at Marnham, Nottinghamshire, on the 24th of April 1743, and educated at Wakefield grammar school. He began his academical studies at University College, Oxford, and in 1764 he was elected to a fellowship at Magdalen. In 1770 he published *Armine and Elvira,* a legendary poem, which was followed in 1779 by *The Prince of Peace*. In 1779 he was presented to the rectory of Goadby Marwood, Leicestershire, to which in 1786 was added a prebend in the cathedral of Lincoln. He took the degree of D.D. at Oxford in 1806. He would probably have passed an obscure life as a country clergyman had not his attention been accidentally turned in 1784 to the possibility of applying machinery to weaving. The result was that he invented a power-loom, for which he took out a patent in 1785; it was a rude contrivance, though it was improved by subsequent patents in 1786 and 1787, and gradually developed into the modern power-loom. Removing to Doncaster in 1785, he started a weaving and spinning factory; it did not, however, prove a financial success, and in 1793 he had to surrender it to his creditors. A mill at Manchester, in which a number of his machines were installed, was wilfully destroyed by fire in 1791. In 1789 he patented a wool-combing machine, for which he took out further patents in 1790 and 1792; it effected large economies in the cost of manufacture, but its financial results were not more satisfactory to its inventor than those of the power-loom, even though in 1801 parliament extended the patent for fourteen years. In 1807 a memorial was presented to the government urging the benefits that had been conferred on the country by the power-loom, and the House of Commons voted him £10,000 in 1809. He then purchased a small farm at Hollander, near Sevenoaks, Kent, where he spent the rest of his life. He died at Hastings on the 30th of October 1823. Other inventions of Cartwright’s included a cordelier or machine for making rope (1792), and an engine working with alcohol (1797), together with various agricultural implements.

CARTWRIGHT, JOHN (1740-1824), English parliamentary reformer, was born at Marnham in Nottinghamshire on the 17th of September 1740, being the elder brother of Edmund Cartwright, inventor of the power-loom. He was educated at Newark grammar school and Heath Academy in Yorkshire, and at the age of eighteen entered the navy. He was present, in his first year of service, at the capture of Cherbourg, and served in the following year in the action between Sir Edward Hawke and Admiral Conflans. Engaged afterwards

under Sir Hugh Palliser and Admiral Byron on the Newfoundland station, he was appointed to act as chief magistrate of the settlement; and the duties of this post he discharged for five years (1765-1770). Ill-health necessitated his retirement from active service for a time in 1771. When the disputes with the American colonies began, he saw clearly that the colonists had right on their side, and warmly supported their cause. At the beginning of the war he was offered the appointment of first lieutenant to the duke of Cumberland, which would have put him on the path of certain promotion. But he declined to fight against the cause which he felt to be just. In 1774 he published his first plea on behalf of the colonists, entitled *American Independence the Glory and Interest of Great Britain.* In the following year, when the Nottinghamshire Militia was first raised, he was appointed major, and in this capacity he served for seventeen years. He was at last illegally superseded, because of his political opinions. In 1776 appeared his first work on reform in parliament, which, with the exception of Earl Stanhope's pamphlets (1774), appears to have been the earliest publication on the subject. It was entitled, *Take your Choice*—a second edition appearing under the new title of *The Legislative Rights of the Commonalty vindicated*. The task of his life was thenceforth chiefly the attainment of universal suffrage and annual parliaments. In 1778 he conceived the project of a political association, which took shape in 1780 as the "Society for Constitutional Information," including among its members some of the most distinguished men of the day. From this society sprang the more famous "Corresponding Society." Major Cartwright worked unweariedly for the promotion of reform. He was one of the witnesses on the trial of his friends, Horne Tooke, John Thelwall and Thomas Hardy, in 1794, and was himself indicted for conspiracy in 1819. He was found guilty in the following year, and was condemned to pay a fine of £100. He died in London on the 23rd of September 1824. He had married in 1780, but had no children. In 1831 a monument from a design by Macdowell was erected to him in Burton Crescent where he had lived.

The Life and Correspondence of Major Cartwright, edited by his niece F.D. Cartwright, was published in 1826.

CARTWRIGHT, PETER (1785-1872), American Methodist Episcopal preacher, was born on the 1st of September 1785 in Amherst county, Virginia. His father, a veteran of the War of Independence, took his family to Kentucky in 1790, and lived near Lancaster until 1793, and then until 1802 in Logan county near the Tennessee line. Peter received little education, and was a gambler at cards and horse-racing until 1801, when he heard John Page preach. In June he was received into the church; in May 1802 was licensed as a regular exhorter, becoming known as the "Kentucky Boy"; in the autumn of 1802 was licensed to form the Livingston circuit around the mouth of the Cumberland river; in 1806 was ordained deacon by Bishop Asbury, and in 1808 presiding elder by Bishop McKendree, under whose direction he had studied theology. He was presiding elder of the Wabash district in 1812, and of Green river district in 1813-1816, and, after four years on circuit in Kentucky and two as presiding elder of the Cumberland district, was transferred in 1823 to the Illinois conference, in which he was presiding elder of various districts until 1869. Up to 1856 he preached some 14,600 times, received some 10,000 persons into the church, and baptized some 12,000 persons. He died near Pleasant Plains, Sangamon county, Illinois, on the 25th of September 1872. He was a typical backwoods preacher, an able, vigorous speaker, and a racy writer.

See the *Autobiography of Peter Cartwright, the Backwoods Preacher*, edited by W.P. Strickland (New York, 1856).

CARTWRIGHT, SIR RICHARD JOHN (1835-), Canadian statesman, was born in Kingston, Canada, on the 4th of December 1835, son of the Rev. R.D. Cartwright, chaplain to H.M. Forces. In 1863 he entered the Canadian parliament as a Conservative, but soon after federation in 1867 quarrelled with his party on the question of their financial policy, which he considered extravagant. By 1870 the breach was complete, and in 1873 he became finance minister of the Liberal ministry of the Hon. Alexander Mackenzie. His honesty and economy were undoubted, but the latter quality was sometimes pushed to extremes. From

1878 to 1896 he was the chief financial critic on the side of the Liberal opposition, and on the accession of Sir Wilfrid Laurier to power in 1896 he became minister of trade and commerce. In 1898-1899 he represented Canada on the Anglo-American joint high commission at Quebec. In 1904 failing health led to his retirement to the senate. He acted in Sir Wilfrid Laurier's absence at the Imperial Conference 1907 as acting premier.

CARTWRIGHT, THOMAS (c. 1535-1603), English Puritan divine, was born in Hertfordshire. He studied divinity at St John's College, Cambridge, but on Mary's accession had to leave the university, and found occupation as clerk to a counsellor-at-law. On the accession of Elizabeth, he resumed his theological studies, and was soon afterwards elected fellow of St John's and later of Trinity College. In 1564 he opposed John Preston in a theological disputation held on the occasion of Elizabeth's state visit, and in the following year helped to bring to a head the Puritan attitude on church ceremonial and organization. He was popular in Ireland as chaplain to the archbishop of Armagh (1565-1567), and in 1569 he was appointed Lady Margaret professor of divinity at Cambridge; but John Whitgift, on becoming vice-chancellor, deprived him of the post in December 1570, and—as master of Trinity—of his fellowship in September 1571. This was a natural consequence of the use which he made of his position; he inveighed bitterly against the hierarchy and constitution of the Anglican Church, which he compared unfavourably with the primitive Christian organization. So keen was the struggle between him and Whitgift that the chancellor, William Cecil, had to intervene. After his deprivation by Whitgift, Cartwright visited Beza at Geneva. He returned to England in 1572, and might have become professor of Hebrew at Cambridge but for his expressed sympathy with the notorious "Admonition to the Parliament" by John Field and Thomas Wilcox. To escape arrest he again went abroad, and officiated as clergyman to the English residents at Antwerp and then at Middelburg. In 1576 he visited and organized the Huguenot churches of the Channel Islands, and after revising the Rhenish version of the New Testament, again settled as pastor at Antwerp, declining the offer of a chair at St Andrews. In 1585 he returned without permission to London, was imprisoned for a short time, and became master of the earl of Leicester's hospital at Warwick. In 1590 he was summoned before the court of high commission and imprisoned, and in 1591 he was once more committed to the Fleet. But he was not treated harshly, and powerful influence soon secured his liberation. He visited Guernsey (1595-1598), and spent his closing years in honour and prosperity at Warwick, where he died on the 27th of December 1603. Cartwright was a man of much culture and originality, but exceedingly impulsive. His views were distinctly Presbyterian, and he stoutly opposed the Brownists or Independents. He never conceived of a separation between church and state, and would probably have refused to tolerate any Nonconformity with his reformed national Presbyterian church. To him, however, the Puritanism of his day owed its systematization and much of its force.

CARTWRIGHT, WILLIAM (1611-1643), English dramatist and divine, the son of a country gentleman who had been reduced to keeping an inn, was born at Northway, Gloucestershire, in 1611. Anthony à Wood, whose notice of Cartwright is in the nature of a panegyric, gives this account of his origin, which is probably correct, although it is contradicted by statements made in David Lloyd's *Memoirs*. He was educated at the free school of Cirencester, at Westminster school, and at Christ Church, Oxford, where he took his M.A. degree in 1635. He became, says Wood, "the most florid and seraphical preacher in the university," and appears to have been no less admired as a reader in metaphysics. In 1642 he was made succentor of Salisbury cathedral, and in 1643 he was chosen junior proctor of the university. He died on the 29th of November of the same year. Cartwright was a "son" of Ben Jonson and an especial favourite with his contemporaries. The collected edition of his poems (1651) contains commendatory verses by Henry Lawes, who set some of his songs to music, by Izaak Walton, Alexander Brome, Henry Vaughan and others, and the king wore mourning on the day of his funeral. His plays are, with the exception of *The Ordinary,* extremely fantastic in plot, and stilted and artificial in treatment. They are: *The Royal Slave* (1636), produced by the students of Christ Church before the king and queen, with music by Henry Lawes; *The*

Lady Errant (acted, 1635-1636; printed, 1651); *The Siege, or Love's Convert* (printed 1651). In *The Ordinary* (1635 ?) he produced a comedy of real life, in imitation of Jonson, representing pot-house society. It is reprinted in Dodsley's *Old Plays* (ed. Hazlitt, vol. xii.).

CARUCATE, or CARRUCATE (from the Med. Lat. *carrucata,* from *carruca*, a wheeled plough), a measure of land, based probably on the area that could be ploughed by a team of oxen in a year; hence "carucage" means a tax levied on each "carucate" of land (see HIDE).

CARÚPANO, a town and port of the state of Bermúdez, Venezuela, 65 m. N.E. of the city of Cumaná. Pop. (1908, estimate) 8600. Carúpano is situated on the Caribbean coast at the opening of two valleys, and is a port of call for several regular steamship lines. Its mean annual temperature is 81° F., but the climate is healthy, because of its open situation on the coast. The country immediately behind the town is rough, but there is a considerable export of cacáo, coffee, sugar, cotton, timber and rum.

CARUS, KARL GUSTAV (1789-1869), German physiologist and psychologist, distinguished also as an art critic and a landscape painter, was born and educated at Leipzig. After a course in chemistry, he began the systematic study of medicine and in 1811 became a *Privat docent*. On the subject which he selected (comparative anatomy) no lectures had previously been given at Leipzig, and Carus soon established a reputation as a medical teacher. In the war of 1813 he was director of the military hospital at Pfaffendorf, near Leipzig, and in 1814 professor to the new medical college at Dresden, where he spent the remainder of his life. He was made royal physician in 1827, and a privy councillor in 1862. He died on the 28th of July 1869. In philosophy Carus belonged to the school of Schelling, and his works are thoroughly impregnated with the spirit of that system. He regarded inherited tendency as a proof that the cell has a certain psychic life, and pointed out that individual differences are less marked in the lower than in the higher organisms. Of his many works the most important are:—*Grundzuge der vergleichenden Anatomic und Physiologie* (Dresden, 1828); *System der Physiologie* (2nd ed., 1847-1849); *Psyche: zur Entwickelungsgeschichte der Seele* (1846, 3rd ed. Stuttgart, 1860); *Physis, zur Geschichte des leiblichen Lebens* (Stuttgart, 1851); *Natur und Idee* (Vienna, 1861); *Symbolik des menschlichen Gestalts* (Leipz., 1853, 2nd ed., 1857); *Atlas der Kranioskopie* (2nd ed. Leipz., 1864); *Vergleichende Psychologie* (Vienna, 1866).

See his autobiography, *Lebenserinnerungen und Denkwurdigkeiten* (4 vols., 1865-1866); K. von Reichenbach, *Odische Erwiederungen an die Herren Professoren Fortlage ... und Hofrath Carus* (1856). His *England und Schottland im Jahre 1844* was translated by S.C. Davison (1846).

CARUS, MARCUS AURELIUS, Roman emperor A.D. 282-283, was born probably at Narbona (more correctly, Narona) in Illyria, but was educated at Rome. He was a senator, and had filled various civil and military posts before he was appointed prefect of the praetorian guards by the emperor Probus, after whose murder at Sirmium he was proclaimed emperor by the soldiers. Although Carus severely avenged the death of Probus, he was himself suspected of having been an accessory to the deed. He does not seem to have

returned to Rome after his accession, but contented himself with an announcement of the fact to the senate. Bestowing the title of Caesar upon his sons Carinus and Numerianus, he left Carinus in charge of the western portion of the empire, and took Numerianus with him on the expedition against the Persians which had been contemplated by Probus. Having defeated the Quadi and Sarmatians on the Danube, Carus proceeded through Thrace and Asia Minor, conquered Mesopotamia, pressed on to Seleucia and Ctesiphon, and carried his arms beyond the Tigris. But his hopes of further conquest were cut short by his death. One day, after a violent storm, it was announced that he was dead. His death was variously attributed to disease, the effects of lightning, or a wound received in a campaign against the Huns; but it seems more probable that he was murdered by the soldiers, who were averse from further campaigns against Persia, at the instigation of Arrius Aper, prefect of the praetorian guard. Carus seems to have belied the hopes entertained of him on his accession, and to have developed into a morose and suspicious tyrant.

CARVACROL, or CYMOPHENOL, $C_{10}H_{13}OH$, or a constituent of the ethereal oil of *Origanum hirtum*, oil of thyme, oil obtained from pepperwort, and wild bergamot. It may be synthetically prepared by the fusion of cymol sulphonic acid with caustic potash; by the action of nitrous acid on 1-methyl-2-amino-4-propyl benzene; by prolonged heating of 5 parts of camphor with 1 part of iodine; or by heating carvol with glacial phosphoric acid. It is extracted from Origanum oil by means of a 10% potash solution. It is a thick oil which sets at -20°C. to a mass of crystals of melting point 0°C, and boiling point 236-237°C. Oxidation with ferric chloride converts it into dicarvacrol, whilst phosphorus pentachloride transforms it into chlorcymol.

CARVAJAL, ANTONIO FERNANDEZ (d. 1659), a Portuguese Marano (*q.v.*) or Crypto-Jew, who came to England in the reign of Charles I. He was the first “endenizened” Jew in England, and by his extensive trade with the West Indies rendered considerable services to the Commonwealth. Besides his commercial value to Cromwell, Carvajal was politically useful also, for he acted as “intelligencer.” When Manasseh ben Israel in 1655 petitioned for the return of the Jews who had been expelled by Edward I., Carvajal took part in the agitation and boldly avowed his Judaism. Carvajal may be termed the founder of the Anglo-Jewish community. He died in 1659.

See Lucien Wolf, “The First English Jew,” *Trans. Jewish Historical Society*, ii. 14.

CARVAJAL, LUISA DE (1568-1614), Spanish missionary in England, was born at Jaraicejo in Estremadura on the 2nd of January 1568. Her father, Don Francisco de Carvajal, was the head of an old and wealthy family which produced many men of note. Her mother, Doña Maria, belonged to the powerful house of Mendoza. Both were people of pious character. The mother died in 1572 from a fever contracted while visiting the poor, and the father took the disease from his wife, and died of it. Luisa and a brother were left to the care of their grand-aunt Maria Chacon, governess of the young children of Philip II. On her death they passed to the care of their maternal uncle, Francisco Hurtado de Mendoza, count of Almazan. The count, who was named viceroy of Navarre by Philip II., was an able public servant in whom religious zeal was carried to the point of inhuman asceticism. His niece attracted his favour by her manifest disposition to the religious life; she sent her own share of dinner to the poor, ate broken meats, wore a chain next her skin, and invited humiliation; and at the age of seventeen she was instructed by the count to make a surrender of her will to two female

servants whom he set over her, and by whom she was repeatedly scourged while naked, trampled upon and otherwise ill-treated. But when Luisa came of age she refused to enter a religious house, and decided to devote herself to the conversion of England. The execution of the Jesuit emissary priest, Henry Walpole, in 1596 had moved her deeply, and she prepared herself by learning English and by the study of divinity. A lawsuit with her brother caused temporary delay, but she secured her share of the family fortune, which she devoted to founding a college for English Jesuits at Louvain; it was transferred to Watten near Saint Omer in 1612, and lasted till the suppression of the Order. In 1605 she was allowed to go to England. She established herself under the protection of the Spanish ambassador, whose house was in the Barbican. From this place of safety she carried on an active and successful propaganda. She made herself conspicuous by her attentions to the Gunpowder Plot prisoners, and won converts, partly by persuasion, partly by helping women of the very poorest class in childbirth, and taking charge of the children. Her activity attracted the attention of the authorities, and she was arrested in 1608. But the protection of the Spanish ambassador Zuñiga, and the desire of King James I. to stand well with Spain, secured her release. In 1613, while staying at a house in Spitalfields, where she had in fact set up a disguised nunnery, she was arrested with all the inmates by the pursuivants of Abbot, archbishop of Canterbury, who had been on the watch for some time. Her release was again secured by the new Spanish ambassador Gondomar, who played with effect on the weakness of King James. By this time, however, the Spanish authorities had begun to discover that she was a political danger to them, and recalled her. Luisa, who had hoped for the crown of martyrdom, was bitterly disappointed, and resisted the order. Before she could be forced to obey she died in the Spanish ambassador’s house on her birthday, the 2nd of January 1614. Her body remained as an object of admiration for months till it was carried back to Spain.

The original authority for the life of Luisa de Carvajal is *La Vida y Virtudes de la Venerable Virgen Doña Luisa de Carvajal y Mendoza* (Madrid, 1632), by the Licentiate Lorenzo Muñoz. It is founded on her own papers collected by her English confessor Michael Walpole. It is largely autobiographical, and contains some examples of her verse. The *Vida y Virtudes* is summarized by Southey in his *Letters from Spain and Portugal* (1808). A life was written by Lady Georgiana Fullerton (1873), in which much that is shocking to modern sentiment is concealed. See also *Quatre Portraits de femmes*, by La Comtesse R. de Courson (Paris, 1895). There are several references to Luisa de Carvajal in the *Records of the English Province of the Society of Jesus*, by Henry Foley (1877-1883).

(D. H.)

CARVER, JOHN (1575?-1621), one of the “Pilgrim Fathers,” first governor of the Plymouth colony in America, was born, probably in Nottinghamshire, England, about 1575. Owing to religious persecution at home he took refuge in Holland about 1607, and eventually became a deacon in the church at Leiden of which John Robinson was the pastor. In 1620 he emigrated to America in the “Mayflower,” and founded the Plymouth colony. Before leaving England he had probably been elected governor; after the signing of the famous “Compact” this election was confirmed; and on the 23rd of March 1620 (1621 N.S.) Carver was re-elected for the ensuing year. Early in April, however, he died from the effects of sunstroke.

CARVER, JONATHAN (c. 1725-1780), American traveller, was born probably in Canterbury, Connecticut. The date usually given for his birth, 1732, is now considered too late, since he was apparently married in 1746. In early life he followed the trade of a shoemaker and subsequently served with the provincial forces in the French and Indian wars. According to his “Journal” he conceived the idea, after the peace of 1763, of exploring Great Britain’s newly acquired territory in the north-west. He is said to have set out in 1766, journeyed westward by way of the Straits of Mackinac and the Fox and Wisconsin rivers to the Mississippi, viewed the Falls of St Anthony, lived for some time among the Indians, and received from them a grant of 100 sq. m. of territory between the Mississippi and St Croix rivers. Returning east in 1768 by way of the north shore of Lake Superior he proceeded in 1769 to England, where he presented a letter of introduction to Benjamin Franklin, and made

vain efforts to interest the board of trade in his investigations. In 1778 there was published in London what purported to be his own narrative of his explorations under the title of *Travels through the Interior Parts of North America in the Years 1766, 1767 and 1768.* It had an immediate success, was translated into French, German and Dutch, and was long generally accepted as a truthful narrative of his travels and observations, and as one of the highest authorities on the manners, customs and language of the Indians of the northern Mississippi valley. Carver died in London on the 31st of January 1780, having married a second time in England although his first wife was still living in America.

Soon after his death a new edition of the *Travels* was brought out by the well-known Quaker physician and author, Dr John Coakley Lettsom (1744-1815), who "edited" the work and furnished a biographical introduction. Some doubt seems to have been early entertained as to the real authorship of the work, Oliver Wolcott in 1792 writing to Jedediah Morse, the geographer, that Carver was too unlettered to have written it, and that in his belief the book was the work of some literary hack. Careful investigation of Indian life and north-western history, notably by H.R. Schoolcraft in 1823, William H. Keating in his narrative of Major Long's Expedition (1824), and Robert Greenhow in his *History of Oregon* (1844), showed a remarkable similarity between the *Travels* and the accounts of several French authorities, but these criticisms were scarcely noticed by later writers. Finally Professor E.G. Bourne, in a paper contributed to the *American Historical Review* for January 1906, proved beyond dispute that the bulk of Carver's alleged narrative was merely a close paraphrase of Charlevoix's *Journal*, La Hontan's *New Voyages to North America*, and James Adair's *History of the American Indians.* Professor Bourne's theory is that the entire book was probably the work of the facile Dr Lettsom, whose personal relations with Carver are known to have been intimate, the "journal" alone, which constituted an inconsiderable part of the whole, having been, in part, founded on Carver's random notes and recollections.

See also J.G. Godfrey, *Jonathan Carver; His Travels in the North-west, 1766-1768* (No. 5 of the Parkman Club Publications, Milwaukee, Wis., 1896), and Daniel S. Durrie, "Captain Jonathan Carver and the Carver Grant," in vol. vi. of the Wisconsin Historical Society's *Collections* (1872).

CARVING. To carve (A.S. *ceorfan*: connected with Gr. γράφειν) is to cut, whatever the material; but apart from the domestic sense of carving meat, the word is more particularly associated with the art of sculpture. The name of sculptor (see SCULPTURE) is commonly reserved for the great masters of the art, especially in stone and marble, while that of carver is given to the artists or workmen who execute the subordinate decorations of architecture. The word is also specially applied to sculpture in ivory (*q.v.*) and its substitutes, and in wood (see WOOD-CARVING) and other soft materials (see also GEM.)

CARVING AND GILDING, two allied operations which formerly were the most prominent features in the important industry of frame-making. The craftsmen who pursued the occupation were known as "carvers and gilders," and the terms still continue to be the recognized trade-name of frame-making, although very little of the ornamentation of frame-work is now accomplished by carving, and much of the so-called gilt ornament is produced without the use of gold. The trade has to do primarily with the frames of pictures, engravings and mirrors, but many of the light decorative fittings of houses, finished in "composition" and gilt work, are also entrusted to the carver and gilder. Fashion in picture frames, like all fashions, fluctuates greatly. Mouldings of the prevailing sizes and patterns are generally manufactured in special factories, and supplied in lengths to carvers and gilders ready for use. A large proportion of such mouldings, especially those of a cheaper and inferior quality, are made in Germany. What is distinctively known as a "German" moulding is a cheap imitation of gilt work made by lacquering over the surface of a white metallic foil. German artisans are also very successful in the preparation of imitation of veneers of rosewood, mahogany, walnut and other ornamental woods. The more expensive mouldings are either in wood (such as oak or mahogany), in veneers of any expensive ornamental wood, or real gilt.

A brief outline of the method of making a gilt frame, enriched with composition ornaments, may be taken as a characteristic example of the operations of the frame-maker. The foundation of such a frame is soft pine wood, in which a moulding of the required size and section is roughly run. To prevent warping the moulding is, or ought to be, made from two or more pieces of wood glued together. The moulding is "whitened up," or prepared for gilding by covering it with repeated coatings of a mixture of finely powdered whiting and size. When a sufficient thickness of the whitening mixture has been applied, the whole surface is carefully smoothed off with pumice-stone and glass-paper, care being taken to keep the angles and curves clear and sharp. Were a plain gilt moulding only desired, it would now be ready for gilding; but when the frame is to be enriched it first receives the composition ornaments. Composition, or "compo," is a mixture of fine glue, white resin, and linseed oil well boiled together, with as much rolled and sifted whiting added as makes the whole into a doughy mass while hot. This composition is worked in a hot state into moulds of boxwood, and so pressed in as to take up every ornamental detail. On its removal from the mould all superfluous matter is trimmed away, and the ornament, while yet soft and plastic, is laid on the moulding, and fitting into all the curves, &c., is fixed with glue. The ornamental surface so prepared quickly sets and becomes very hard and brittle. When very large bold ornaments are wanted for frames of unusual size they are moulded in *papier maché.* Two methods of laying on gold—oil-gilding and water-gilding—are practised, the former being used for frames broken up with enrichments. For oil-gilding the moulding is prepared with two coats of fine thin size to fill the pores of the wood, and afterwards it receives a coat of oil gold-size, which consists of a mixture of boiled linseed oil and ochre. When this gold-size is in a "tacky" or "sticky" condition, gold-leaf is laid on and carefully pressed over and into all parts of the surface; and when covered with a coat of finish-size the gilding is complete. Water-gilding is applied to plain mouldings and all considerable unbroken surfaces, and is finished either "matt" or burnished. For these styles of work the mouldings are properly sized, and after the size (which for "matt" is red in colour and for burnish blue) is dry the gold is laid on with water. Matt-work is protected with one or two coats of finish-size; but burnished gold is finished only by polishing with an agate burnisher—no size or water being allowed to touch such surfaces. The mitring up of frames, the mounting and fitting up of paintings, engravings, &c., involve too many minor operations to be noticed here in detail; but these, with the cutting and fitting of glass, cleaning and repairing pictures and prints, and similar operations, all occupy the attention of the carver and gilder.

CARY, ALICE (1820-1871), and **PHOEBE** (1824-1871), American poets, were born at Mount Healthy, near Cincinnati, Ohio, respectively on the 26th of April 1820 and the 4th of September 1824. Their education was largely self-acquired, and their work in literature was always done in unbroken companionship. Their poems were first collected in a volume entitled *Poems of Alice and Phoebe Carey* [*sic*] (1850). In 1850-1851 they removed to New York, where the two sisters, befriended by Rufus W. Griswold (1815-1857), the *quasi*-dictator of American verse, and Horace Greeley, occupied a prominent position in literary circles. In 1868-1869 Alice Cary served for a short time as the first president of Sorosis, the first woman's club organized in New York. Alice, who was much the more voluminous writer of the two, wrote prose sketches and novels, now almost forgotten, and various volumes of verse, notably *The Lover's Diary* (1868). Her lyrical poem, *Pictures of Memory*, was much admired by Edgar Allan Poe. Phoebe published two volumes of poems (1854 and 1868), but is best known as the author of the hymn "Nearer Home," beginning "One sweetly solemn thought," written in 1852. Alice died in New York City on the 12th of February 1871, and Phoebe in Newport, Rhode Island, on the 31st of July of the same year. The collected *Poetical Works of Alice and Phoebe Cary* were published in Boston in 1886.

See Mrs Mary Clemmer Ames's *Memorial of Alice and Phoebe Carey* (New York, 1873).

CARY, ANNIE LOUISE (1842-), American singer, was born in Wayne, Maine, on the 22nd of October 1842. She studied in Milan, and made her début as an operatic contralto in

Copenhagen in 1868. She had a successful European career for several years, singing in Stockholm, Paris and London, and made her New York first appearance in 1870. She only once returned to Europe for a brilliant Russian tour, and until she retired in 1882, on her marriage to Charles M. Raymond, she was the most popular singer in America.

CARY, HENRY FRANCIS (1772-1844), English author and translator, was born at Gibraltar on the 6th of December 1772, the son of a captain in the army. He was educated at the grammar schools of Rugby, Sutton Coldfield and Birmingham, and at Christ Church, Oxford, which he entered in 1790. He took holy orders, and was presented in 1797 to the vicarage of Abbott's Bromley in Staffordshire. This benefice he held till his death. In 1800 he was also presented to the vicarage of Kingsbury in Warwickshire. While still at school he had become a regular contributor to the *Gentleman's Magazine*, and had published a volume of *Sonnets and Odes.* At Christ Church he devoted much time to the study of French and Italian literature; and the fruits of these studies appeared in the notes to his classic translation of Dante. The version of the *Inferno* was published in 1805, together with the original text. Soon afterwards Cary moved to London, where he became reader at Berkeley chapel, and subsequently lecturer at Chiswick and curate of the Savoy. His version of the whole *Divina Commedia* did not appear till 1814. It was published at Cary's own expense, as the publisher refused to undertake the risk, owing to the failure incurred over the *Inferno*. The translation was brought to the notice of Samuel Rogers by Thomas Moore. Rogers made some additions to an article on it by Ugo Foscolo in the *Edinburgh Review.* This article, and praise bestowed on the work by Coleridge in a lecture at the Royal Institution, led to a general acknowledgment of its merit. Gary's *Dante* thus gradually took its place among standard works, passing through four editions in the translator's lifetime. It has the great merits of accuracy, idiomatic vigour and readableness; it preserves the sincerity and vividness of the original; and, although many rivals have since appeared in the field, it still holds an honourable place. Its blank verse, however, cannot represent the close woven texture and the stately music of the *terza rima* of the original. In 1824 Cary published a translation of *The Birds* of Aristophanes, and, about 1834, of the *Odes* of Pindar. In 1826 he was appointed assistant-librarian in the British Museum, a post which he held for about eleven years. He resigned because the appointment of keeper of the printed books, which should have been his in the ordinary course of promotion, was refused him when it fell vacant. In 1841 a crown pension of £200 a year, obtained through the efforts of Samuel Rogers, was conferred on him. Cary's *Lives of the early French Poets*, and *Lives of English Poets* (from Johnson to Henry Kirke White), intended as a continuation of Johnson's *Lives of the Poets*, were published in a collected form in 1846. He died in London on the 14th of August 1844, and was buried in Westminster Abbey.

A memoir was published by his son, Henry Cary, in 1847.

CARYATIDES (Latinized from the Greek; the plural of Caryatis, *i.e.* a woman of Caryae in Laconia), in architecture, the term given to the draped female figures used for piers or supports, as found in the porticos of the Erechtheum and of the Treasury of Cnidus at Delphi (see GREEK ART, fig. 17).

CARYL, JOSEPH (1602-1673), English Nonconformist divine, was born in London in 1602. He graduated at Exeter College, Oxford, and became preacher at Lincoln's Inn. He frequently preached before the Long Parliament, and was a member of the Westminster Assembly in 1643. By order of the parliament he attended Charles I. in Holmby House, and in 1650 he was sent with John Owen to accompany Cromwell to Scotland. In 1662 he was

ejected from his church of St Magnus near London Bridge, but continued to minister to an Independent congregation in London till his death in March 1673, when John Owen succeeded him. His piety and learning are displayed in his ponderous commentary on Job (12 vols., 4to., 1651-1666; 2nd ed., 2 vols., fol. 1676-1677).

CARYOPHYLLACEAE, a botanical order of dicotyledonous plants, containing about 60 genera with 1300 species, and widely distributed, especially in temperate, alpine and arctic regions. The plants are herbs, sometimes becoming shrubby at the base, with opposite, simple, generally uncut leaves and swollen nodes. The main axis ends in a flower (definite inflorescence), and flower-bearing branches are borne one on each side by which the branching is often continued (known technically as a dichasial cyme). The flowers are regular, with four or five sepals which are free or joined to form a tube in their lower portion, the same number of petals, free and springing from below the ovary, twice as many stamens, inserted with the petals, and a pistil of two to five carpels joined to form an ovary containing a large number of ovules on a central placenta and bearing two to five styles; the ovary is one-celled or incompletely partitioned at the base into three to five cells; honey is secreted at the base of the stamens. The fruit is a capsule containing a large number of small seeds and opening by apical teeth; the seed contains a floury endosperm and a curved embryo.

FIG. 1.—Stitchwort (*Stellaria Holostea*). 1, Flower cut vertically; 2, seed; 3, same cut vertically; 4, same cut horizontally.

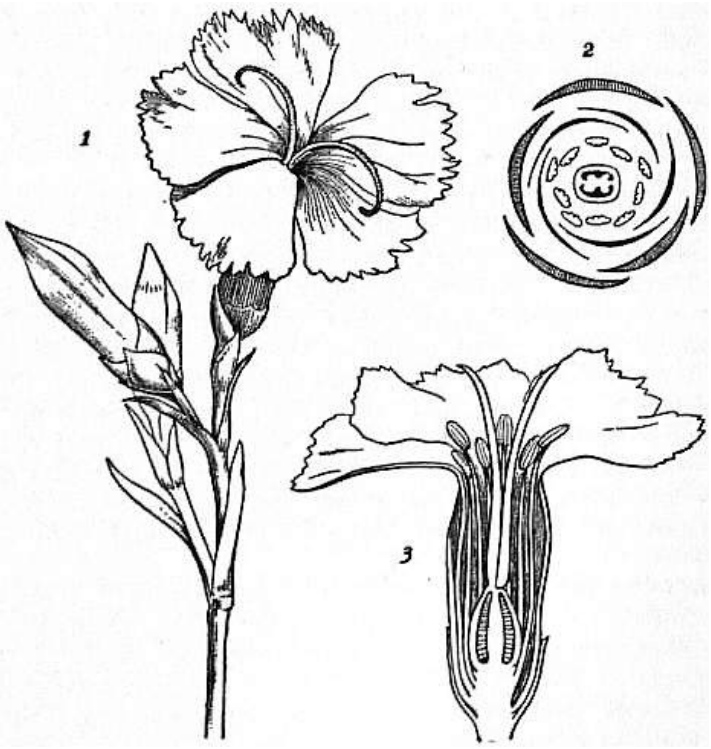


FIG. 2.—1, Flowering shoot of Pink (*Dianthus*); 2, horizontal plan of flower; 3, flower in vertical section.

The order is divided into two well-defined tribes which are distinguished by the character of the flower and the arrangements for ensuring pollination.

Tribe I. *Alsineae*: the sepals are free and the flowers are open, with spreading petals, and the honey which is secreted at the base of the stamens is exposed to the visits of short-tongued insects, such as flies and small bees; the petals are white in colour. It includes several British genera, *Cerastium* (mouse-ear chickweed), *Stellaria* (fig. 1) (stitchwort and chickweed), *Arenaria* (sandwort), *Sagina* (pearlwort), *Spergula* (spurrey) and *Spergularia* (sandwort spurrey).

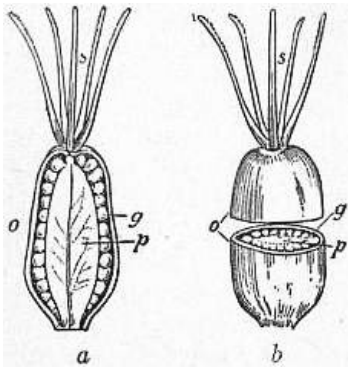


FIG. 3.

a, Pistil of *Cerastium hirsutum* cut vertically; *o*, unilocular or monothecal ovary; *p*, free central placenta; *g*, ovules; *s*, styles.

b, The same cut horizontally, and the halves separated so as to show the interior of the cavity of the ovary *o*, with the free central placenta *p*, covered with ovules *g*.

Tribe II. *Sileneae*: the sepals are joined below to form a narrow tube, in which stand the long claws of the petals and the stamens, partly closing the tube and rendering the honey inaccessible to all but long-tongued insects such as the larger bees and Lepidoptera. The flowers are often red. It includes several British genera:—*Dianthus* (pink) fig. 2, *Silene* (catchfly, bladder campion), *Lychnis* (campion, *L. Flos-Cuculi* is ragged robin), and *Githago* or *Agrostemma* (corn cockle). Several, such as *Lychnis vespertina, Silene nutans* and others, are night-flowering, opening their flowers and becoming scented in the evening or at night, when they are visited by night-flying moths.

The plants of this order are of little or no economic value, soap-wort, *Saponaria officinalis*, forming a lather in water was formerly officinal. *Dianthus* (carnation and pink) *Gypsophila, Lychnis* and others, are garden plants.

CASABIANCA, RAPHAEL, COMTE DE (1738-1825), French general, was descended from a noble Corsican family. In 1769 he took the side of France against Genoa, then mistress of the island. In 1793, having entered the service of the revolutionary government, he was appointed lieutenant-general in Corsica in place of Pascale Paoli, who was outlawed for intrigues with England. For his defence of Calvi against the English he was appointed general of division, and he served in Italy from 1794 to 1798. After the 18th of Brumaire he

entered the senate and was made count of the empire in 1806. In 1814 he joined the party of Louis XVIII., rejoined Napoleon during the Hundred Days, and in 1819 succeeded again in entering the chamber of peers.

His nephew, Louis de Casabianca (1762-1798), entered the French navy, served in the convoy of the French troops sent to aid the revolted American colonies, and took part in various naval actions off the North American coast. He became captain in 1792, represented Corsica in the Convention, and then received command of the *Orient*, which at the battle of the Nile bore the flag of Admiral Brueys. When the latter was killed, Casabianca, though badly wounded, fought the burning ship to the end, and perished with most of the crew. His son, Giacomo Jocante, a boy of ten years of age, refused to leave the ship and died in trying to save his father. This heroic act was the subject of several poems, including the well-known ballad by Mrs. Hemans.

CASABLANCA (*Dar el Baida*, "the white house"), a seaport on the Atlantic coast of Morocco, in 33° 27′ N., 7° 46′ W. It is a wool and grain port for central Morocco, chiefly for the provinces of Tadla and Shawia. Third in importance of the towns on the Moorish coast, unimpeded by bar or serious rocks, the roadstead is exposed to the north-west winds. There is anchorage for steamers in 5 to 6 fathoms. Vessels were loaded and discharged by lighters from the beach. In May 1907 the construction began of harbour works which afford sheltered accommodation for ships at all states of the tide. The value of the foreign trade of the port for the period 1897-1907 was about £750,000 a year. A railway to Ber Reshid, the first section of a line intended to tap the rich agricultural region of which Casablanca is the port, was opened in September 1908, being the first railway built in Morocco. The population, about 20,000, includes numerous foreign merchants, Franciscan and Protestant missions, and a consular corps. Built by the Portuguese upon the site of the once prosperous town of Anfa, which they had destroyed in 1468, Casablanca was held by them for some time, till trouble with the natives compelled them to abandon it. In August 1907, in consequence of the murder of a number of French and Spanish workmen engaged on the harbour works, the town was bombarded and occupied by the French (see Morocco: *History*).

CASALE MONFERRATO, a town and episcopal see of Piedmont, Italy, in the province of Alessandria, 21 m. N.N.W. by rail from the town of Alessandria. Pop. (1901) 18,874 (town); 31,370 (commune). It lies in the plain on the right bank of the Po, 377 ft. above sea-level, and is a junction for Mortara, Vercelli. Chivasso and Asti; it is also connected by steam tramways with Alessandria, Vercelli and Montemagno. The fine Lombard Romanesque cathedral, originally founded in 742, was rebuilt in the early 12th century and consecrated in 1106; it suffered from restoration in 1706, but has been brought back to its original form. It contains some good pictures. The church of S. Domenico is a good Renaissance edifice, and there are some fine palaces. The church of S. Ilario is said to occupy the site of a pagan temple, but the name of the ancient town (if any) which occupied this site is not known. About 10 m. distant is the Sacro Monte di Crea, with eighteen chapels on its slopes containing terra-cotta groups of statues, resembling those at Varallo. Casale Monferrato was given by Charlemagne to the church of Vercelli, but obtained its liberty from Frederick I. (Barbarossa). It was sacked by the troops of Vercelli, Alessandria and Milan in 1215, but rebuilt and fortified in 1220. It fell under the power of its marquises in 1292, and became the chief town of a small state. In 1536 it passed to the Gonzagas of Mantua, who fortified it very strongly. It has since been of considerable importance as a fortress: it successfully resisted the Austrians in 1849, and was strengthened in 1852. There is a large Portland cement factory here.

CASAMARI, a Cistercian abbey in the province of Rome, 6 m. E.S.E. of Veroli. It marks the site of Cereatae, the birthplace of Marius, afterwards known, as inscriptions attest, as Cereatae Marianae, having been separated perhaps by the triumvirs, from the territory of Arpinum. We find it under the early empire as an independent community. The abbey is a fine example of Burgundian early-Gothic (1203-1217), paralleled in Italy by Fossanuova alone (which is almost contemporary with it), and is very well preserved.

See C. Enlart, “Origines françaises de l’architecture gothique en Italie” (*Bibliothèque des écoles françaises d’Athènes et de Rome,* fasc. 66), (Paris, 1894).

CASANOVA DE SEINGALT, GIOVANNI JACOPO (1725-1798), Italian adventurer, was born at Venice in 1725. His father belonged to an ancient and even noble family, but alienated his friends by embracing the dramatic profession early in life. He made a runaway marriage with Zanetta Farusi, the beautiful daughter of a Venetian shoemaker; and Giovanni was their eldest child. When he was but a year old, his parents, taking a journey to London, left him in charge of his grandmother, who, perceiving his precocious and lively intellect, had him educated far above her means. At sixteen he passed his examination and entered the seminary of St Cyprian in Venice, from which he was expelled a short time afterwards for some scandalous and immoral conduct, which would have cost him his liberty, had not his mother managed somehow to procure him a situation in the household of the Cardinal Acquaviva. He made but a short stay, however, in that prelate’s establishment, all restraint being irksome to his wayward disposition, and took to travelling. Then began that existence of adventure and intrigue which only ended with his death. He visited Rome, Naples, Corfu and Constantinople. By turns journalist, preacher, abbé, diplomatist, he was nothing very long, except *homme à bonnes fortunes*, which profession he cultivated till the end of his days. In 1755, having returned to Venice, he was denounced as a spy and imprisoned. On the 1st of November 1756 he succeeded in escaping, and made his way to Paris. Here he was made director of the state lotteries, gained much financial reputation and a considerable fortune, and frequented the society of the most notable French men and women of the day. In 1759 he set out again on his travels. He visited in turn the Netherlands, South Germany, Switzerland—where he made the acquaintance of Voltaire,—Savoy, southern France, Florence—-whence he was expelled,—and Rome, where the pope gave him the order of the Golden Spur. In 1761 he returned to Paris, and for the next four or five years lived partly here, partly in England, South Germany and Italy. In 1764 he was in Berlin, where he refused the offer of a post made him by Frederick II. He then travelled by way of Riga and St Petersburg to Warsaw, where he was favourably received by King Stanislaus Poniatowski. A scandal, followed by a duel, forced him to flee, and he returned by a devious route to Paris, only to find a *lettre de cachet* awaiting him, which drove him to seek refuge in Spain. Expelled from Madrid in 1769, he went by way of Aix—where he met Cagliostro—to Italy once more. From 1774, with which year his memoirs close, he was a police spy in the service of the Venetian inquisitors of state; but in 1782, in consequence of a satirical libel on one of his patrician patrons, he had once more to go into exile. In 1785 he was appointed by Count Waldstein, an old Paris acquaintance, his librarian at the château of Dux in Bohemia. Here he lived until his death, which probably occurred on the 4th of June 1798.

The main authority for Casanova’s life is his *Mémoires* (12 vols., Leipzig, 1826-1838; later ed. in 8 vols., Paris, 1885), which were written at Dux. They are clever, well written and, above all, cynical, and interesting as a trustworthy picture of the morals and manners of the times. Among Casanova’s other works may be mentioned *Confutazione della storia del governo Veneto d’Amelot de la Houssaye* (Amsterdam, 1769), an attempt to ingratiate himself with the Venetian government; and the *Histoire* of his escape from prison (Leipzig, 1788; reprinted Bordeaux, 1884; Eng. trans, by P. Villars, 1892). Ottmann’s *Jacob Casanova* (Stuttgart, 1900) contains a bibliography.

CASAS GRANDES (“Great Houses”), a small village of Mexico, in the state of Chihuahua, situated on the Casas Grandes or San Miguel river, about 35 m. S. of Llanos and 150 m. N.W.

of the city of Chihuahua. The railway from Ciudad Juarez to Terrazas passes through the town. It is celebrated for the ruins of early aboriginal buildings still extant, about half a mile from its present site. They are built of “sun-dried blocks of mud and gravel, about 22 in. thick, and of irregular length, generally about 3 ft., probably formed and dried *in situ*.” The walls are in some places about 5 ft. thick, and they seem to have been plastered both inside and outside. The principal edifice extends 800 ft. from north to south, and 250 ft. east to west; its general outline is rectangular, and it appears to have consisted of three separate piles united by galleries or lines of lower buildings. The exact plan of the whole is obscure, but the apartments evidently varied in size from mere closets to extensive courts. The walls still stand at many of the angles with a height of from 40 to 50 ft., and indicate an original elevation of several storeys, perhaps six or seven. At a distance of about 450 ft. from the main building are the substructions of a smaller edifice, consisting of a series of rooms ranged round a square court, so that there are seven to each side besides a larger apartment at each corner. The age of these buildings is unknown, as they were already in ruins at the time of the Spanish Conquest. The whole district of Casas Grandes is further studded with artificial mounds, from which are excavated from time to time large numbers of stone axes, metates or corn-grinders, and earthern vessels of various kinds. These last have a white or reddish ground, with ornamentation in blue, red, brown or black, and are of much better manufacture than the modern pottery of the country. Similar ruins to those of Casas Grandes exist near the Gila, the Salinas, and the Colorado and it is probable that they are all the erections of one people. Bancroft is disposed to assign them to the Moquis.

> See vol. iv. of H.H. Bancroft’s *The Native Races of the Pacific States of North America*, of which the principal authorities are the *Noticias del Estado de Chihuahua* of Escudero, who visited the ruins in 1819; an article in the first volume of the *Album Mexicano*, the author of which was at Casas Grandes in 1842; and the *Personal Narrative of Explorations and Incidents in Texas, New Mexico, California, Sonora and Chihuahua* (1854), by John Russell Bartlett, who explored the locality in 1851.

CASAUBON, FLORENCE ESTIENNE MÉRIC (1599-1671), English classical scholar, son of Isaac Casaubon, was born at Geneva on the 14th of August 1599. At an early age he joined his father in England, and completed his education at Eton and Oxford (B.A. 1618). His defence of his father against the attacks of certain Catholics (*Pietas contra maledicos patrii Nominis el Religionis Hostes*, 1621), secured him the notice and favour of James I., who conferred upon him a prebendal stall in Canterbury cathedral. He also vindicated his father’s literary reputation against certain impostors who had published, under his name, a work on *The Origin of Idolatry (Vindicatio Patris adversus Impostores*, 1624). During the Civil War he lived a retired life, and after its conclusion refused to acknowledge the authority of Cromwell, who, notwithstanding, requested him to write an “impartial” history of the events of the period. In spite of the tempting inducements held out, he declined, and also refused the post of inspector of the Swedish universities offered him by Queen Christina. After the Restoration, he was reinstated in his benefice, and devoted the rest of his life to literary work. He died at Canterbury on the 14th of July 1671. Méric Casaubon’s reputation was overshadowed by that of his father; but his editions of numerous classical authors, and especially of the *Meditations* of Marcus Aurelius (also English translation, new ed. by W.H.D. Rouse, 1900), were highly valued. Among his other works may be mentioned: *De Quatuor Linguis Commentatio* (1650), *Of the Necessity of Reformation* (1664), *On Credulity and Incredulity in Things natural, civil and divine* (1668).

CASAUBON, ISAAC (1550-1614), French (naturalized English) classical scholar, was born at Geneva, on the 18th of February 1559, of French refugee parents. On the publication of the edict of January 1562, the family returned to France and settled at Crest in Dauphiné, where Arnaud Casaubon, Isaac’s father, became minister of a Huguenot congregation. Till he was nineteen, Isaac had no other instruction than what could be given him by his father during the years of civil war. Arnaud was away from home whole years together in the

Calvinist camp, or the family were flying to the hills to hide from the fanatical bands of armed Catholics who patrolled the country. Thus it was in a cave in the mountains of Dauphiné, after the massacre of St Bartholomew, that Isaac received his first lesson in Greek, the text-book being Isocrates *ad Demonicum*.

At nineteen Isaac was sent to the Academy of Geneva, where he read Greek under Francis Portus, a native of Crete. Portus died in 1581, having recommended Casaubon, then only twenty-two, as his successor. At Geneva he remained as professor of Greek till 1596. Here he married twice, his second wife being Florence, daughter of the scholar-printer, Henri Estienne. Here, without the stimulus of example or encouragement, with few books and no assistance, in a city peopled with religious refugees, and struggling for life against the troops of the Catholic dukes of Savoy, Casaubon made himself a consummate Greek scholar and master of ancient learning. His great wants at Geneva were books and the sympathy of learned associates. He spent all he could save out of his small salary in buying books, and in having copies made of such classics as were not then in print. Henri Estienne, Théodore de Beza (rector of the university and professor of theology), and Jacques Lect (Lectius), were indeed men of superior learning. But Henri, in those last years of his life, was no longer the Estienne of the *Thesaurus*; he was never at home, and would not suffer his son-in-law to enter his library. “He guards his books,” writes Casaubon, “as the griffins in India do their gold!” Beza was engrossed by the cares of administration, and retained, at most, an interest for theological reading, while Lect, a lawyer and diplomatist, had left classics for the active business of the council. The sympathy and help which Casaubon’s native city could not afford him, he endeavoured to supply by cultivating the acquaintance of the learned of other countries. Geneva, as the metropolis of Calvinism, received a constant succession of visitors. 442
The continental tour of the young Englishman of birth was not complete without a visit to Geneva. It was there that Casaubon made the acquaintance of young Henry Wotton, the poet and diplomatist, who lodged in his house and borrowed his money. Of more consequence to Isaac Casaubon was the acquaintance of Richard Thomson (“Dutch” Thomson), fellow of Clare College, Cambridge; for it was through Thomson that the attention of Joseph Scaliger, settled in 1593 at Leiden, was directed to Casaubon. Scaliger and Casaubon first exchanged letters in 1594. Their intercourse, which was wholly by letter, for they never met, passes through the stages of civility, admiration, esteem, regard and culminates in a tone of the tenderest affection and mutual confidence. Influential French men of letters, the Protestant Jacques Bongars, the Catholic Jacques de Thou, and the Catholic convert Philippe Canaye, sieur du Fresne, aided him by presents of books and encouragement, and endeavoured to get him invited, in some capacity, to France.

This was effected in 1596, in which year Casaubon accepted an invitation to the university of Montpellier, with the title of *conseiller du roi* and *professeur stipendié aux langues et bonnes lettres*. In Montpellier he never took root. He held the professorship there only three years, with several prolonged absences. The hopes raised by his brilliant reception were disappointed; he was badly treated by the authorities, by whom his salary was only paid very irregularly, and, finally, not at all. He was not, at any time, insensible to the attractions of teaching, and his lectures at Montpellier were followed not only by the students, but by men of mature age and position. But the love of knowledge was gradually growing upon him, and he began to perceive that editing Greek books was an employment more congenial to his peculiar powers than teaching. At Geneva he had first tried his hand on some notes on Diogenes Laërtius, on Theocritus and the New Testament, the last undertaken at his father’s request. His début as an editor had been a complete Strabo (1587), of which he was so ashamed afterwards that he apologized for its crudity to Scaliger, calling it “a miscarriage.” This was followed by the text of Polyaenus, an *editio princeps*, 1589; a text of Aristotle, 1590; and a few notes contributed to Estienne’s editions of Dionysius of Halicarnassus and Pliny’s *Epistolae*. It is not till we come to his edition of Theophrastus’s *Characteres* (1592), that we have a specimen of that peculiar style of illustrative commentary, at once apposite and profuse, which distinguishes Casaubon among annotators. At the time of his removal to Montpellier he was engaged upon what is the capital work of his life, his edition of, and commentary on, Athenaeus.

In 1598 we find Casaubon at Lyons, superintending the passage of his Athenaeus through the press, for which he had been unable to find facilities at Montpellier. Here he lived in the house of Méric de Vicq, *surintendant de la justice*, a Catholic, but a man of acquirements, whose connexions were with the circle of liberal Catholics in Paris. In the suite of De Vicq Casaubon made a flying visit to Paris, and was presented to Henry IV. The king was very gracious, and said something about employing Casaubon’s services in the “restoration” of the fallen university of Paris. Full of hope he returned to Montpellier. In January 1599, he received a summons to repair to Paris. But the terms of the letter missive were so vague that,

though it bore the sign manual, Casaubon hesitated to act upon it. However, he resigned his chair at Montpellier, but instead of hastening to Paris, he lingered more than a year at Lyons, in De Vicq's house, where he hoped to meet the king, who was expected to visit the south. Nothing more was heard about the professorship, but instead he was summoned by De Vicq, who was then in Paris, to come to him in all haste on an affair of importance. The business proved to be the Fontainebleau Conference. Casaubon allowed himself to be persuaded to sit as one of the referees who were to adjudicate on the challenge sent to Du Plessis Mornay by Cardinal Duperron. By so doing he placed himself in a false position, as Scaliger said: "Non debebat Casaubon interesse colloquio Plessiaeano; erat asinus inter simias, doctus inter imperitos" (*Scaligerana* 2^{α}). The issue was so contrived that the Protestant party could not but be pronounced to be in the wrong. By concurring in the decision, which was unfavourable to Du Plessis Mornay, Casaubon lent the prestige of his name to a court whose verdict would without him have been worthless, and confirmed the suspicions already current among the Reformed churches that, like his friend and patron, Canaye du Fresne, he was meditating abjuration. From this time forward he became the object of the hopes and fears of the two religious parties; the Catholics lavishing promises, and plying him with arguments; the Reformed ministers insinuating that he was preparing to forsake a losing cause, and only higgling about his price. We now know enough of Casaubon's mental history to know how erroneous were these computations of his motives. But, at the time, it was not possible for the immediate parties to the bitter controversy to understand the intermediate position between Genevan Calvinism and Ultramontanism to which Casaubon's reading of the fathers had conducted him.

Meantime the efforts of De Thou and the liberal Catholics to retain him in Paris were successful. The king repeated his invitation to Casaubon to settle in the capital, and assigned him a pension. No more was said about the university. The recent reform of the university of Paris had closed its doors to all but Catholics; and though the chairs of the Collège de France were not governed by the statutes of the university, public opinion ran so violently against heresy, that Henry IV. dared not appoint a Calvinist to a chair, even if he had desired to do so. But it was designed that Casaubon should succeed to the post of sub-librarian of the royal library when it should become vacant, and a patent of the reversion was made out in his favour. In November 1604, Jean Gosselin died in extreme old age; and Casaubon succeeded him as sub-librarian, with a salary of 400 livres in addition to his pension.

In Paris Casaubon remained till 1610. These ten years were the brightest period of his life. He had attained the reputation of being, after Scaliger, the most learned man of the age,—an age in which learning formed the sole standard of literary merit. He was placed above penury, though not in easy circumstances. He had such facilities for religious worship as a Huguenot could have, though he had to go out of the city to Hablon, and afterwards to Charenton, for them. He enjoyed the society of men of learning, or of men who took an interest in learned publications. He had the best opportunities of seeing men of letters from foreign countries as they passed through Paris. Above all, he had ample facilities for using Greek books, both printed and in MS., the want of which he had felt painfully at Geneva and Montpellier, and which no other place but Paris could at that period have supplied.

In spite of all these advantages we find Casaubon restless, and ever framing schemes for leaving Paris, and settling elsewhere. It was known that he was open to offers, and offers came to him from various quarters,—from Nîmes, from Heidelberg, from Sedan. His friends Lect and Giovanni Diodati wished, rather than hoped, to get him back to Geneva. The causes of Casaubon's discomfort in Paris were various, but the principal source of uneasiness lay in his religion. The life of any Huguenot in Paris was hardly secure at that time, for it was doubtful if the police of the city was strong enough to protect them against any sudden uprising of the fanatical mob, always ready to re-enact the St Bartholomew. But Casaubon was exposed to persecution of another sort. Ever since the Fontainebleau Conference an impression prevailed that he was wavering. It was known that he rejected the *outré* anti-popery opinions current in the Reformed churches; that he read the fathers, and wished for a church after the pattern of the primitive ages. He was given to understand that he could have a professorship only by recantation. When it was found that he could not be bought, he was plied by controversy. Henry IV., who liked Casaubon personally, made a point of getting him to follow his own example. By the king's orders Duperron was untiring in his efforts to convert him. Casaubon's knowledge of the fathers was that of a scholar, Duperron's that of an adroit polemist; and the scholar was driven to admit that the polemist was often too hard for him. These encounters mostly took place in the king's library, over which the cardinal, in his capacity of aumonier, exercised some kind of authority; and it was therefore impossible for Casaubon to avoid them. On the other hand, the Huguenot theologians, and especially Pierre du Moulin, chief pastor of the church of Paris, accused him of conceding too much,

and of having departed already from the lines of strict Calvinistic orthodoxy.

When the assassination of Henry IV. gave full rein to the Ultramontane party at court, the obsessions of Duperron became more importunate, and even menacing. It was now that Casaubon began to listen to overtures which had been faintly made before, from the bishops and the court of England. In October 1610 he came to England in the suite of the ambassador, Lord Wotton of Marley (brother of Casaubon's early friend), an official invitation having been sent him by Richard Bancroft, archbishop of Canterbury. He had the most flattering reception from James I., who was perpetually sending for him to discuss theological matters. The English bishops were equally delighted to find that the great French scholar was an Anglican ready made, who had arrived, by independent study of the Fathers, at the very *via media* between Puritanism and Romanism, which was becoming the fashion in the English Church. Casaubon, though a layman, was collated to a prebendal stall in Canterbury, and a pension of £300 a year was assigned him from the exchequer. Nor were these merely paper figures. When Sir Julius Caesar made a difficulty about payment, James sent a note in his own hand: "Chanceler of my excheker, I will have Mr Casaubon paid before me, my wife, and my barnes." He still retained his appointments in France, and his office as librarian. He had obtained leave of absence for a visit to England, where his permanent settlement was not contemplated. In order to retain their hold upon him, the government of the queen regent refused to allow his library to be sent over. It required a special request from James himself to get leave for Madame Casaubon to bring him a part of his most necessary books. Casaubon continued to speak of himself as the servant of the regent, and to declare his readiness to return when summoned to do so.

Meanwhile his situation in London gradually developed unforeseen sources of discomfort. Not that he had any reason to complain of his patrons, the king and the bishops. James continued to the last to delight in his company, and to be as liberal as the state of his finances allowed. John Overall had received him and his whole family into the deanery of St Paul's, and entertained him there for a year. Overall and Lancelot Andrewes, then bishop of Ely, were the most learned men of a generation in which extensive reading was more general among the higher clergy than it has ever been since. These two were attracted to Casaubon by congenial studies and opinions. With the witty and learned bishop of Ely in particular Casaubon was always happy to spend such hours as he had to spare from the labours of the study. Andrewes took him to Cambridge, where he met with a most gratifying reception from the notabilities of the university. They went on together to Downham, where Casaubon spent six weeks of the summer of 1611, in which year he became naturalized. In 1613 he was taken to Oxford by Sir Henry Savile, where, amid the homage and feasting of which he was the object, his principal interest was for the MSS. treasures of the Bodleian. The honorary degree which was offered him he declined.

But these distinctions were far from compensating the serious inconveniences of his position. Having been taken up by the king and the bishops, he had to share in their rising unpopularity. The courtiers looked with a jealous eye on a pensioner who enjoyed frequent opportunities of taking James I. on his weak side—his love of book talk—opportunities which they would have known how to use. Casaubon was especially mortified by Sir Henry Wotton's persistent avoidance of him, so inconsistent with their former intimacy. His windows were broken by the roughs at night, his children pelted in the streets by day. On one occasion he himself appeared at Theobalds with a black eye, having received a blow from some ruffian's fist in the street. The historian Hallam thinks that he had "become personally unpopular"; but these outrages from the vulgar seem to have arisen solely from the cockney's antipathy to the Frenchman. Casaubon, though he could make shift to read an English book, could not speak English, any more than Mme Casaubon. This deficiency not only exposed him to insult and fraud, but restricted his social intercourse. It excluded him altogether from the circle of the "wits"; either this or some other cause prevented him from being acceptable in the circle of the lay learned—the "antiquaries." William Camden, the antiquary and historian, he saw but once or twice. Casaubon had been imprudent enough to correct Camden's Greek, and it is possible that the ex-head-master of Westminster kept himself aloof in silent resentment of Casaubon's superior learning. With Robert Cotton and Henry Spelman he was slightly acquainted. Of John Selden we find no mention. Though Sir Henry Savile ostensibly patronized him, yet Casaubon could not help suspecting that it was Savile who secretly prompted an attempt by Richard Montagu to forestall Casaubon's book on Baronius. Besides the jealousy of the natives, Casaubon had now to suffer the open attacks of the Jesuit pamphleteers. They had spared him as long as there were hopes of getting him over. The prohibition was taken off, now that he was committed to Anglicanism. Not only Joannes Eudaemon, Heribert Rosweyd and Scioppius (Gaspar Schoppe),[1] but a respectable writer, friendly to Casaubon, Andreas Schott of Antwerp, gave currency to the insinuation that

Casaubon had sold his conscience for English gold.

But the most serious cause of discomfort in his English residence was that his time was no longer his own. He was perpetually being summoned out of town to one or other of James's hunting residences that the king might enjoy his talk. He had come over from Paris in search of leisure, and found that a new claim on his time was established. The king and the bishops wanted to employ his pen in their literary warfare against Rome. They compelled him to write first one, then a second, pamphlet on the subject of the day,—the royal supremacy. At last, ashamed of thus misappropriating Casaubon's stores of learning, they set him upon a refutation of the *Annals* of Baronius, then in the full tide of its credit and success. Upon this task Casaubon spent his remaining strength and life. He died in great suffering on the 1st of July 1614. His complaint was an organic and congenital malformation of the bladder; but his end was hastened by an unhealthy life of over-study, and latterly by his anxiety to acquit himself creditably in his criticism on Baronius. He was buried in Westminster Abbey. The monument by which his name is there commemorated was erected in 1632 by his friend Thomas Morton when bishop of Durham.

Besides the editions of ancient authors which have been mentioned, Casaubon published with commentaries Persius, Suetonius, the *Scriptores Historiae Augustae*. The edition of Polybius, on which he had spent vast labour, he left unfinished. His most ambitious work was his revision of the text of the *Deipnosophistae* of Athenaeus, with commentary. The Theophrastus perhaps exhibits his most characteristic excellences as a commentator. The *Exercitationes in Baronium* are but a fragment of the massive criticism which he contemplated; it failed in bringing before the reader the uncritical character of Baronius's history, and had only a moderate success, even among the Protestants. His correspondence (in Latin) was finally collected by Van Almeloveen (Rotterdam, 1709), who prefixed to the letters a careful life of Isaac Casaubon. But this learned Dutch editor was acquainted with Casaubon's diary only in extract. This diary, *Ephemerides*, of which the MS. is preserved in the chapter library of Canterbury, was printed in 1850 by the Clarendon Press. It forms the most valuable record we possess of the daily life of a scholar, or man of letters, of the 16th century.

(M. P.)

A few minor changes have been made in the above article, compared with its form in the 9th edition. The most complete account of Casaubon is the full biography by Mark Pattison (1875), of which a second and revised edition, by H. Nettleship, was published in 1892; the most recent work on the subject is *Isaac Casaubon, sa vie et son temps*, by L.J. Nazelle (1897); there is a monograph on the Fontainebleau conference by J.A. Lalot (1889). Casaubon is the subject of one of St Beuve's *Causeries*, the 30th of July 1860 (a notice of the Oxford edition of the *Ephemerides*). See also the article in E. Haag's *La France Protestante* (1882), and J.E. Sandys, *Hist. of Class. Schol.* vol. ii. (ed. 1908), pp. 204 foll.

1 Eudaemon was a Cretan, Rosweyd a Dutch, Jesuit; Schoppe, a German philologist and critic.

CASCADE MOUNTAINS, a continuation northward of the Sierra Nevada, some 500 m. across the states of Oregon and Washington, U.S.A., into British Columbia. In American territory the range lies from 100 to 150 m. from the coast. The Cascades are separated on the S. from the Sierras by deep valleys near Mt. Shasta in California, while on the N., somewhat below the international boundary of 49° N., they approach the northern Rockies, mingling with these in inextricable confusion, although their name is given also to the much-broken, river-dissected, central mountain plateau that crosses British Columbia from S.E. to N.W. Geologically the Sierras and Cascades are very different, though their exact relations are not yet clearly determined; topographically they are also different. The Cascades are in general a comparatively low, broad mass surmounted by a number of imposing peaks in Oregon and Washington. Especially north of the Columbia river, the range widens out into a plateau. There are no notable elevations in British Columbia. Evidences of volcanic activity in comparatively recent geologic time are abundant throughout the length of the range, and all the highest summits are volcanic cones, covered with snow fields and, in a number of instances, with glaciers. The grandest peaks are Shasta (14,380 ft.) at the southern end, and Rainier (or Tacoma, 14,363 ft.) in Washington, two of the most magnificent mountains of America. Other notable summits are Mt. Pitt (9760), Mt. Scott (9122), Diamond Peak (8807), Mt. Thielsen (9250), Mt. Jefferson (10,200) and Mt. Hood (11,225), in Oregon; and Stuart

(9470), St Helens (10,000), Baker (10,827) and Adams (12,470), in Washington. The Fraser river in the far north, the Columbia at the middle, and the Klamath in the south cut athwart the range to the Pacific, and many minor streams descend the range to swell their waters, while some drain directly from the flanks of the mountains into Puget Sound and Gray's Harbor. The Columbia has cut almost to the sea-level through the great mountain mass, the Dalles being only about 100 ft. above the sea. It is to the Cascades of the tremendous rapids at this point that the mountains owe their name. The slopes of the Cascades, particularly on the west, which has a very much moister climate than the eastern slope, are clothed with magnificent forests, chiefly of coniferous evergreens: firs, pine, tamarack and cedar. The Douglas fir, the "Oregon pine" of commerce, often attaining a height of 250 ft., is one of the most beautiful trees in the world. There are also a variety of deciduous trees, but in the aggregate they are unimportant. In 1910 the mountain forests were largely included in ten national forest reserves, with a total area of nearly 16,000,000 acres, extending from the northern boundary of Washington to the southern boundary of Oregon. The magnificent forest cloak, splendid peaks, great open mountain plateau pastures, and exquisite lakes embosomed in mountain fastnesses and forest gloom, give variety to the scenery, which is often grand, and throughout the range indescribably beautiful, though perhaps not equal to the Sierra Nevada in splended light and colour. Large game—deer, bears, mountain sheep and goats, wolves and panthers—still abound. Two great railway systems, the Great Northern and the Northern Pacific, cross the Cascades through noteworthy tunnels; that on the former line is 2½ m. long, that on the latter a little less than 2 m.

See OREGON and WASHINGTON; also G.O. Smith and F.C. Calkins, *A Geological Reconnaissance across the Cascade Range near the Forty-Ninth Parallel* (Washington, D.C., 1904), being U.S. Geological Survey Bulletin 253.

CASE, JOHN (d. 1600), English Aristotelian scholar and physician, was born at Woodstock. He was educated at Oxford, and elected to a fellowship at St John's College, which he was obliged to resign in consequence of his Roman Catholic sympathies. He subsequently opened a philosophical school in Oxford, which was largely attended. He enjoyed a great reputation as a logician and dialectician, and was in addition an authority on music and a distinguished physician. He is described as "a man of an innocent, meek, religious and studious life," an agreeable conversationalist, an enthusiastic teacher, and a great favourite with his pupils. Most of his works were commentaries on various treatises of Aristotle (*Organon, Ethics, Politics, Oeconomics, Physics*) under curious titles; they enjoyed a large circulation during his time, and were frequently reprinted. He was also the author of *The Praise of Musicke* (1586), dedicated to Sir Walter Raleigh.

CASE. (1) (From Lat. *casus*, that which falls or happens; *cadere*, to fall), a word used in various senses traceable to the derivation. In grammar, the "cases" are the various forms in the declension of a noun, adjective or pronoun, the Latin word being a translation of the Greek πτῶσις, falling, applied by Aristotle to the variations from the simple form of the word, whether noun, verb or adjective (of which the adverb would be a πτῶσις). Later grammarians confined the term to nouns, and included the nominative. In law, "case" is the common term for a cause or suit brought before a court of justice. Certain particular legal usages may also be noted. *Action on the case* means an action for the recovery of damages for an injury to the person or property, where the act done was not immediately injurious (see CONTRACT; TORT). A *case stated* is a statement of facts drawn up by one court for the opinion of another on a point of law. A *special case* is a statement of facts agreed to on behalf of two or more litigant parties, and submitted for the opinion of a court of justice as to the law bearing upon the facts so stated. A *leading case* is a decision which settles some point of importance. In the legal systems of the United Kingdom and of the United States decided cases are considered authoritative for courts of at least equal jurisdiction with those in which the judgments were given, but on the continent of Europe the rule is, following that of the Roman law, that they are instructive but not authoritative.

(2) (O. Fr. *casse*, mod. *châsse*, Lat. *capsa*, from *capere*, to hold; cf. “cash”), a box, sheath or covering. The term is applied to the natural protective covering of seed-vessels, and of a pupa or chrysalis. It is also used of a box containing instruments, pistols, swords, &c., and sometimes of the contents. In building, a “case” is the facing where the backing may be of inferior material; the framework in which a window or door is hung; or the wall surrounding a stair, “staircase” properly signifying the whole structure of walls and stairs. In bookbinding, a “case” means the boards and back in which the books are bound; and in typography, the tray, divided into partitions, containing the type ready for the compositor’s use.

CASEMATE (Ital. *casa*, a house, and *matta*, dull or dim), an armoured vault or chamber, or in field fortification, a bombproof shelter; in architecture, a hollow moulding, chiefly employed in cornices.

CASEMENT (from a Lat. form *casamentum*), in architecture, a frame in wood or metal, which holds the glass of a window, and is hung by hinges either at the top, bottom or sides.

CASERTA, a town and episcopal see of Campania, Italy, the capital of the province of Caserta, situated 21 m. N. by E. of Naples by rail via Accerra, and 23 m. via Aversa. Pop. (1901) town, 19,180; commune, 33,373. The modern town (229 ft.) was a mere village belonging to the Caetani family of Sermoneta, who were counts of Caserta, until its purchase from them by Charles IV. of Naples, and the erection of the royal palace, begun by Luigi Vanvitelli (van Wittel) in 1752, but not completed until 1774 for Charles’s son Ferdinand IV. It forms a rectangle, the south front being 830 ft. long and 134 ft. high, with 37 windows in each storey. The interior is richly decorated with marbles, almost all of which, except the white Carrara marble, are Neapolitan or Sicilian. The staircase, the chapel and the theatre are especially sumptuous. The extensive gardens which occupy the hillside behind the palace are adorned with fountains and cascades; the botanical garden contains many trees from northern climates. Two miles north is S. Leucio, a village founded by Ferdinand IV. in 1789, with a royal casino, and large silk factories which are still active. The old town (Caserta Vecchia) lies high (1310 ft.) about 3 m. to the north-east. It was founded in the 9th century by the Lombards of Capua. The cathedral has not suffered from restoration. It was completed in 1153. It is a copy of that of Sessa Aurunca, and preserves the type of the Latin basilica. The campanile, Sicilian in style, was completed in 1234, while the dome, which betrays similar motives, is even later. Its pulpit is decorated with the richest polychrome mosaic that can be found anywhere in Sicily or south Italy, and is quite Moslem in its brilliance. It is indeed remarkable to find these motives in a church so far inland (Bertaux, *L’Art dans l’Italie méridionale*, Paris, 1904, i. 353, &c.). There are also the ruins of the old walls.

CASE-SHOT, a projectile used in ordnance for fighting at close quarters. It consists of a thin metal case containing a large number of bullets or other small projectiles (see AMMUNITION). Case-shot was formerly called “canister,” though the term now used occurs as early as 1625.

CASH, (1) (From O. Fr. *casse*, mod. *caisse*, a box or chest; cf. “case”), a term which, originally meaning a box in which money is kept, is now commonly applied to ready money or coin. In commercial and banking usage “cash” is sometimes confined to specie; it is also, in opposition to bills, drafts or securities, applied to bank-notes. Hence “to cash” means to convert cheques and other negotiable instruments into coin. In bookkeeping, in such expressions as “petty cash,” “cash-book,” and the like, it has the same significance, and so also in “cash-payment” or ready-money payment as opposed to “credit,” however the payment may be made, by coin, notes or cheque.

The “cash on delivery” or “collect on delivery” system, known as C.O.D., is one whereby a tradesman can, through a delivery agency, send goods to a customer, and have the money due to him collected on the delivery of the same, with a guarantee from the carrier that, if no money be collected, the goods shall be returned. The function of such an agency is performed in the United States of America by the express companies (see EXPRESS). In most countries of the continent of Europe the post office acts as such an agent, as in Germany (where the system is known as *Post-Nachnahme*) and in France (*contre remboursement*). It is also in use in India, where it is known as “value payable,” and was introduced in 1877 in Australia. The advantages of the system are obvious, from the point of view both of the customer, who can, by post or telegram, order and obtain speedy delivery from large towns, and of the tradesman, whose area of trade is indefinitely extended. The system does away with credit or the delay and inconvenience of paying in advance. The success of the large “catalogue” houses in America has been mainly due to the system as operated by the express companies. At various times, notably in 1904, it has been proposed that the General Post Office of the United Kingdom should adopt the system. The consistent opposition of the retail traders in large urban centres other than the large stores, and of the country shopkeeper generally, has been sufficient to secure the refusal of the postmaster-general to the proposed scheme, but a commencement was made in 1908 for orders not exceeding £20 between the United Kingdom and Egypt, Cyprus and Malta, and certain British post offices in Turkey and Tangier.

(2) (From Tamil *kasū*, Sinhalese *kasi*, a small coin, adopted by Portuguese as *caixa*, a box, and similarly assimilated in English to “cash” above), a name given by English residents in the East to native coins of small value, and particularly to the copper coinage of China, the native name for which is *tsien*. This, the only coin minted by the government, should bear a fixed ratio of 1000 cash to one *tael* of silver, but in practice there is no such fixed value. It is the universal medium of exchange throughout China for all retail transactions. The *tsien* is a round disk of copper alloy, with a square hole punched through the centre for stringing. A “string of cash” amounts to 500 or 1000 cash, strung in divisions of 50 or 100.

CASHEL, a city of Co. Tipperary, Ireland, in the east parliamentary division, 5 m. S.E. of Goold’s Cross and Cashel station on the main line of the Great Southern & Western railway, 96 m. S.W. from Dublin. Pop. of urban district (1901) 2938. The town, which lies at the base of the Rock of Cashel, is of somewhat poor appearance, but contains several public buildings. There are also the cathedral church of St John the Baptist (c. 1780), the deanery house (once the bishop’s palace), and a Roman Catholic church. Cashel gives name to a Roman Catholic archdiocese.

The Rock of Cashel is the object of chief interest in the place. This elevation of limestone formation rises abruptly from the plain to a height of about 300 ft. and is a commanding object for many miles around. Its summit is occupied by one of the most interesting assemblages of ruins in Ireland, consisting of the remains of St Patrick’s cathedral, a round tower, Cormac’s chapel, and an ancient cross. The chapel, which is said to have been erected by King Cormac M‘Carthy in the 12th century, combines the ancient form of high stone roof, having chambers between the pitch and the vault, with the richest Norman decoration; the chancel arch being of especial magnificence. The cathedral, of the 13th century, is cruciform in design, with lancet windows and pointed arches, and contains many interesting sculptures and tombs. In the adjoining cemetery there stands, on a rude pedestal, whereon the kings of Munster were crowned, the “Cross of Cashel,” with an effigy of St Patrick and a portrayal of the Crucifixion sculptured on its sides. The round tower, situated at the north-east angle of the cathedral, is 80 ft. high with a circumference of 50 ft., and unlike the neighbouring ruins is built, not of the limestone of the “Rock,” but of freestone. Of the defences of the Rock a

massive guard-tower and portions of the wall remain. At the base of the Rock is Hore Abbey, a Cistercian foundation (1272), exhibiting a similar style of architecture to that of the cathedral on the Rock; and within the town is a Dominican priory (1243), of which the east window is a beautiful example of the style of the period. From the Rock itself an extensive prospect is commanded over the rich Golden Vale backed by the Galtee Mountains, the Devil’s Bit, and other ranges; the clustering roofs of the city providing a picturesque foreground.

The history of Cashel belongs to the early period of Irish chronology. Legend states that the vision of an angel blessing the Rock, seen by two swineherds early in the 5th century, led Core Mac Luighdheach, king of Munster, to establish a stronghold here. It became one of the principal seats of the kings of Munster, but in 1101 it was given over to the church by King Murkertagh O’Brien. It afterwards became noteworthy as the place where Henry II. received the homage of O’Brien, king of Limerick, and still later, where Edward Bruce held his Irish parliament. The cathedral was burnt in 1495 by the earl of Kildare. Cashel was taken by storm during the wars of 1647. It was reduced from an archbishopric to a bishopric in 1839, and was disfranchised, on account of corrupt practice, in 1870, having previously returned one member to parliament.

CASHEW NUT, the fruit of the cashew, cadju or acajou tree, *Anacardium occidentale* (nat. ord. Anacardiaceae), a native of the West Indian Islands. The fruit is kidney-shaped, about an inch in length, and the kernel is enclosed in two coverings, the outer of which is smooth, grey and leathery. Inside this external rind is a dark-coloured layer, containing an excessively acrid juice. The kernels have a bland, oily, pleasant taste. They are much eaten, both raw and roasted, in the tropical regions in which the tree is cultivated, and they yield a light-coloured, sweet-tasted oil, said to be equal to olive oil for culinary purposes. The fruit-stalk, immediately under the fruit, is swollen and fleshy, and assumes a pear-like shape. This swollen portion of the stalk has a pleasant acid taste, and is eaten under the name of cashew apple. By fermentation it yields an alcoholic beverage, from which a spirit for drinking is distilled in the West Indies and Brazil. The stem of the tree yields a gum analogous to gum arabic.

Anacardium occidentale, Cashew Nut plant, belonging to the nat. ord. Anacardiaceae.

1. Branch (*reduced*), bearing flowers and fruit. The fruit-stalks are enlarged in a pear-like form, bearing the nut (the true fruit) at their apex.
2. Flower expanded.
3. Stamen and pistil, with the calyx; one fertile stamen longer than the others.
4. Stamen separated.
5. Nut constituting the fruit.
6. Nut opened longitudinally.
7. Seed separated from the nut.
8. Cotyledons opened to show the radicle *a*, and the plumule.

CASHIBO, or CARAPACHE (“bat”), a tribe of South American Indians of Pannoan stock, living in scanty numbers on the west side of the Ucayali, Peru. They are a wild, savage people who have always been foremost in attacks on the Jesuits. They joined Juan Santos in 1744 in the destruction of missions.

CASHIER. (1) (Adapted from the Fr. *caissier*, one in charge of the *caisse*, or money-box), one who has charge of the payment or receiving of money in a business house. The “cashier” may be a high executive official of a banking or mercantile house—thus the name of chief cashier of the Bank of England appears on all notes issued during his occupation of the post—or he may be merely a clerk, who receives payment for goods sold, and has the right to give receipts for the same.

(2) (In origin ultimately the same as “quash,” to annul, from Lat. *quassare*, to dash or break to pieces, a frequentative of *quatere*, to shake, but also connected in form and meaning with

cassare, to make, *cassus*, empty or void), a military term, meaning originally to disband, and probably adopted from the Dutch in the 16th century. The word in various forms is used in the same sense in most European languages. It is now used in English for the dismissal of a commissioned officer from the army and navy for particularly serious offences, in the words of the Army Act, 1881, s. 16, for "behaving in a scandalous manner unbecoming an officer and a gentleman." "Cashiering" involves not merely the loss of the commission, but also a permanent disqualification from serving the state in any capacity.

CASH REGISTER, a species of calculating machine adapted for use in connexion with the cash-tills of shops, in order to provide a record of the money received. Such machines are made in great variety and widely used. Sometimes the records are constituted by holes punched in a roll of paper; in other cases they are shown on dials by the aid of adding mechanism. A common form has a number of keys, each representing a particular sum and each attached to a counting mechanism which records how many times it has been used. By pressing appropriate combinations of these keys the amount of any purchase can be registered, and the combined records of all the counting mechanism give the total that has been passed through the machine in any selected period. Each key when pressed also raises an indicator which informs the customer how much he has to pay. In their more elaborate forms these cash registers may have a separate money-drawer for each assistant employed in the shop, thus enabling the proprietor to ascertain how many customers each man has served and how much money he has taken, and also to fix responsibility for mistakes, bad money, &c. The machines are also made to deliver a printed receipt for each purchase, showing the amount, date and assistant concerned, and they may be arranged to keep separate records of credit sales, money received on account, and money paid out.

CASILINUM (mod. *Capua*), an ancient city of Campania, Italy, 3 m. N.W. of the ancient Capua. Its position at the point of junction of the Via Appia and Via Latina, and at their crossing of the river Volturnus by a three-arched bridge, which still exists, gave it considerable importance under the Roman republic; and while the original pre-Roman town, which was doubtless dependent on the neighbouring Capua, stood entirely on the left (S.) bank, surrounded on three sides by the river, the Roman city extended to the right bank also; remains of it have been found at some 25 ft. below the modern ground-level, the river-bed having risen considerably. In the Second Punic War it was occupied by Fabius Cunctator in 217 B.C., taken by Hannibal after a gallant defence by troops from Praeneste and Perusia in the winter of 216-215, but recaptured in the following year, serving the Romans as their base of operations against Capua. It lost its independence and became a *praefectura*. Caesar conducted a colony thither in 59 B.C., which was renewed by Antony in 44 B.C. The veterans took Octavian's side after Caesar's death, but it seems to have been united with Capua before the time of Vespasian, and it does not occur in the list of independent communities given by Pliny, who indeed (*Hist. Nat.* iii. 70) speaks of the *morientis Casilini reliquiae*, and only its position at the junction of the roads redeemed it from utter insignificance.

(T. As.)

CASIMIR III., called "THE GREAT," king of Poland (1310-1370), the son of Wladislaus Lokietek, king of Poland, and Jadwiga, princess of Kalisch, was born at Kowal in Kujavia in 1310. Casimir belongs to that remarkable group of late medieval sovereigns who may be called the fathers of modern diplomacy, inasmuch as they relegated warfare to its proper place as the instrument of politics, and preferred the council-chamber to the battle-field. He was educated at the court of Charles Robert of Hungary, who had married Casimir's beautiful sister Elizabeth, and who gave his brother-in-law an excellent education under

Italian masters. In his youth Casimir was considered frivolous and licentious; while his sudden flight from the field of Plowce, the scene of his father's great victory over the Teutonic knights, argued but poorly for his personal courage. When, therefore, he ascended the Polish throne in 1333, the future of his country, which then consisted of little more than the lately reunited provinces of Great and Little Poland, seemed dark indeed; especially as she was still at war with the Teutonic Order and with John of Luxemburg, king of Bohemia, who claimed the crown of Poland also. Fortunately Casimir was a man of penetrating genius. His father had been a hero who trusted entirely to his sword, yet the heroic struggle of a lifetime had barely sufficed to keep at bay the numerous and potent foes with which Poland was environed. Casimir recognized from the first that further fighting against tremendous odds was unprofitable. A careful, calculating dynastic policy, which aimed at the establishment of an equilibrium by means of prudent compromises and defensive alliances, was, he rightly judged, the best guarantee for the future safety and glory of Poland. Casimir began by tying the hands of the Teutonic Order by the truce of Thorn; he induced the king of Bohemia to relinquish his claims to the Polish throne by consenting to leave him a free hand in Silesia (conference of Trencsén, early in 1335); and subsequently he attended the celebrated congress of Visegrád (November 12-December 3, 1335), where Charles Robert entertained him and the king of Bohemia magnificently. At this congress the differences between Casimir and John of Bohemia were finally adjusted; peace was made between the king of Poland and the Teutonic Order on the basis of the cession of Pomerania, Kulm, and Michalow to the knights, who retroceded Kujavia and Dobrzyn; and the kings of Hungary and Poland further agreed to assist each other in the acquisition of the south-eastern border province of Halicz, or Red Russia (very nearly corresponding to the modern Galicia), in case the necessity for intervention should arise. The Holy See, jealous of the growing power of the house of Luxemburg, attempted to set aside the decrees of the congress of Visegrád, by urging Casimir to take up arms against the knights once more; but Casimir prudently refrained from hostilities, and ultimately compensated himself in the south-east for his losses in the north. To guarantee still further the integrity of Poland, Casimir, who had no male issue, concluded a compact with Charles Robert whereby he recognized Louis, Charles Robert's son, as the successor to the Polish crown; Louis on his part contracting to confirm the privileges of the Polish gentry and clergy, and to rule Poland through natives only.

In 1340 the death of George II. of Halicz, and the ravaging of that fruitful border principality by the Tatars, induced Casimir and Charles Robert to establish their joint influence there, and in 1344 the Red Russian boyar, Demetrius Detko, was appointed *starosta*, or governor, in the names of the two kings. Nine years later Lubart of Lithuania, who also had claims upon Red Russia, disputed the sway of Poland in that principality. Hungary coming to the assistance of Poland, Lubart was defeated and taken prisoner; but Casimir, anxious to avoid a bloody war with Lithuania's Tatar allies, came to a compromise with Lubart whereby Poland retained Halicz with Lemberg, while Vladimir, Belz, and Brzesc fell to the share of Lithuania. With the Teutonic knights, still Poland's most dangerous foe, Casimir preserved peaceful relations throughout his reign. He kept them within due bounds by using the influence of the Luxemburgers against them at the papal court; but the disputes between Poland and the order were ultimately settled by the peace of Kalisz (July 23, 1343), when the knights engaged for the first time to pay tribute to the Polish crown. John of Bohemia was also a constant thorn in the side of Casimir. Silesia, now split up into seventeen principalities, was the bone of contention between them; and when Casimir suddenly invaded that country, took Wschowa, and made Prince Charles of Bohemia a prisoner, war between the two kingdoms actually broke out and Casimir was besieged in Cracow by the Czechs. But his Hungarian allies hastened to his assistance, and the mediation of the Holy See restored peace in 1346. The death of the adventurous John at Crécy, and the election of his son as emperor, still further improved the situation. Charles IV., a cautious sovereign with many cares, was as anxious for the maintenance of peace as Casimir himself. Thus the relations between them were never very seriously disturbed.

Throughout his reign Casimir never neglected the great work of domestic reform, greatly aided by Jaroslaw Skotowicki, archbishop of Gnesen, formerly a professor at Bologna. The first result of their joint labours was the much-needed codification of the laws of Great and Little Poland in 1347. This was followed by the establishment of a supreme court of appeal in 1357. Towards everything like disorder, tyranny, or aristocratic oppression, Casimir was always inexorably severe; all disturbers of the peace were remorselessly put to death as the worst enemies of their country and he enjoyed in consequence the honourable title of "the Peasants' King." The lawlessness of the nobility was most noticeable in the province of Great Poland, where outrageous acts of violence were of everyday occurrence. To remedy the evil, Casimir drew up and promulgated the severe statute of Great Poland, which went to the very root of the matter and greatly strengthened the hands of the king's justices. Casimir also did

much for education. Stimulated by the example of Charles IV., who had founded the university of Prague in 1348, Casimir on the 12th of May 1364 established and richly endowed the first university of Cracow, which had five professors of Roman law, three of Canon law, two of physics, and one master of arts. The security of the kingdom was sensibly promoted by the erection of a cordon of fortresses on its north-eastern borders, and a blow was given to foreign interference when Casimir succeeded in gaining dominant influence over the independent Polish principality of Masovia, which had hitherto gravitated between Bohemia and the Teutonic Order.

Casimir's last political act was the conclusion of a fresh alliance with Louis of Hungary against Charles IV. at Buda in 1369. He died on the 5th of November 1370 from the effects of an injury received while hunting. Though married three times Casimir left no sons; but he had the satisfaction of knowing that his domains would pass into the hands of a nephew every whit as capable and sagacious as himself.

See Jan Leniek, *The Congress of Visegrád* (Pol.), (Lemberg, 1884); J.K. Kochanowski, *Casimir the Great* (Pol.), (Warsaw, 1900); Kazimierz J. Gorzycki, *The Annexation of Red Russia by Casimir the Great* (Pol.), (Lemberg, 1889); Stanislaw Kryzanowski, *The Embassy of Casimir the Great to Avignon* (Pol.), (Cracow, 1900).

(R. N. B.)

CASIMIR IV., king of Poland (1427-1492), second son of Wladislaus II. Jagiello, was appointed while still a lad grand-duke of Lithuania by his father, and crowned king of Poland at Cracow in June 1447, three years after the death of his elder brother, Wladislaus III., at the battle of Varna. The cause of this long interregnum was the disinclination of the Lithuanians to part with their prince till their outstanding differences with Poland, relating chiefly to the delimitation of the frontiers of the two states, had been settled. Casimir's reign of forty-five years was epoch-making for Poland. He was without doubt one of the greatest statesmen of his age, concealing beneath a simple exterior and homely habits a profound political sagacity and an unerring common-sense, and possessing in a high degree those useful qualities of patience, moderation, and tenacity, which characterized nearly all the princes of the house of Jagiello. Throughout life he steadily followed two guiding principles—the preservation of the political union between Poland and Lithuania at whatever cost, and the recovery of the lost lands of old Poland. It was due entirely to his steadfast adherence to these principles that Poland in the course of the 15th century rose to the rank of a great power; but by a singular irony of fate, Casimir, in consequence of his unswerving efforts to make his country glorious and prosperous, entirely forfeited the popularity of his Polish subjects, whose true interests he understood far better than they did themselves. Thus his refusal to sacrifice Polish to Lithuanian or Lithuanian to Polish interests caused both Poles and Lithuanians to accuse the far-seeing monarch of partiality and favouritism; while his anti-German policy, on which the future safety of the dual state depended, could only be carried through by the most humiliating concessions to patrician pride and greed. His difficulties were moreover considerably enhanced by the fact that he was not of an essentially martial temperament, and could not therefore appeal to the heroic side of the Polish character.

The great triumph of Casimir's reign was the final subjugation of the Teutonic Order, a triumph only accomplished after a harassing and desultory thirteen years' war, during which Casimir's own subjects gave him more trouble than all his enemies. The pretext of the rupture was the attempt of the knights to crush the Prussian diet, which, bearing as it did most of the burdens, claimed fairly enough a proportionate share in the government of the Prussian provinces. Excommunicated by the pope and placed under the ban of the Empire, the Prussian cities and gentry naturally turned to their nearest neighbour, Poland, for protection. In October 1453 they placed themselves beneath the overlordship of Casimir; on the 4th of February 1454 formally renounced their ancient allegiance to the Order; and some weeks later captured no fewer than fifty-seven towns and castles. On the 6th of March 1454 Casimir issued a manifesto directing the incorporation of the Prussian provinces with Poland, but granting them at the same time freedom from taxation and full autonomy. But except in the border province of Great Poland, the acquisition of this new territory excited little interest and no enthusiasm in Poland generally. The local diets granted subsidies with a niggard hand, and for the conduct of the war the king soon had to depend almost entirely on Hussite mercenaries, who frequently turned against him when their wages were not paid. The Polish gentry on the other hand exhibited far less energy in the field than in the council

chamber; they were defeated again and again by the knights, and showed themselves utterly incapable of taking fortresses. No wonder then if in the earlier years of the war the Order recovered its lost ground, and the king, irritated beyond endurance by the suicidal parsimony of the estates, threatened to retire to the forests of Lithuania. But manlier counsels prevailed, the struggle was resumed, and after the bloody victory of Puck (September 17, 1462) the scales of fortune inclined decisively to the side of Poland. Finally the Holy See intervened, and by the second peace of Thorn (October 14, 1466) all West Prussia, as it is now called, was ceded to Poland, while East Prussia was left in the hands of the knights, who held it as a fief of the Polish crown.

The intervention of the Curia, which hitherto had been hostile to Casimir because of his steady and patriotic resistance to papal aggression, was due to the permutations of European politics. The pope was anxious to get rid of the Hussite king of Bohemia, George Poděbrad, as the first step towards the formation of a league against the Turk. Casimir was to be a leading factor in this combination, and he took advantage of it to procure the election of his son Wladislaus as king of Bohemia. But he would not commit himself too far, and his ulterior plans were frustrated by the rivalry of Matthias Corvinus, king of Hungary, who even went so far as to stimulate the Teutonic Order to rise against Casimir. The death of Matthias in 1490 was a great relief to Poland, and Casimir employed the two remaining years of his reign in consolidating his position still further. He expired rather suddenly while hunting at Troki in Lithuania in June 1492.

The feature of Casimir’s character which most impressed his contemporaries was his extraordinary simplicity and sobriety. He, one of the greatest monarchs in Europe, habitually wore plain Cracow cloth, drank nothing but water, and kept the most austere of tables. His one passion was the chase. Yet his liberality to his ministers and servants was proverbial, and his vanquished enemies he always treated with magnificent generosity. Casimir’s married life was singularly happy. His consort, Elizabeth of Austria, “the mother of the Jagiellos,” bore him six sons and seven daughters, and by her affection and good counsel materially relieved the constant anxieties and grievous burdens of his long and arduous reign.

See Jan Dlugosz, *Opera* (Cracow, 1887); August Sokolowski, *Illustrated History of Poland* (Pol.), vol. ii. (Vienna, 1904).

(R. N. B.)

CASIMIR-PÉRIER, JEAN PAUL PIERRE (1847-1907), fifth president of the French Republic, was born in Paris on the 8th of November 1847, being the grandson of Casimir Pierre Périer (*q.v.*) the famous premier of Louis Philippe. He entered public life as secretary to his father, A.V.L.C. Périer, who was minister of the interior under the presidency of Thiers. In 1874 he was elected general councillor of the Aube, and was sent by the same department to the chamber of deputies in the general elections of 1876, and he was always re-elected until his presidency. In spite of the traditions of his family, Casimir-Périer joined the group of Republicans on the Left, and was one of the 363 on the *Seize-Mai* (1877). If he refused to vote the expulsion of the princes in 1883, and resigned as deputy upon the enactment of the law, it was only owing to personal connexions with the family of Orleans. On the 17th of August 1883 he became under-secretary of state for war, and retained that position until the 7th of January 1885. From 1890 to 1892 he was vice-president of the chamber, then in 1893 president. On the 3rd of December he became prime-minister, holding the department of foreign affairs, resigned in May 1894, and was re-elected president of the chamber. On the 24th of June 1894, after the assassination of President Carnot, he was elected president of the republic by 451 votes against 195 for Henri Brisson and 97 for Charles Dupuy. His presidency lasted only six months. The resignation of the Dupuy ministry on the 14th of January 1895 was followed the next day by that of the president. Casimir-Périer explained his action by the fact that he found himself ignored by the ministers, who did not consult him before taking decisions, and did not keep him informed upon political events, especially in foreign affairs. From that time he definitely and absolutely abandoned politics, and devoted himself to business—especially mining. At the trial of Dreyfus at Rennes, Casimir-Périer’s evidence, as opposed to that of General Mercier, was of great value to the cause of Dreyfus. He died on the 11th of March 1907.

CASINO (diminutive of *casa*, a house), the Italian name for a pleasure-house in a garden, which has been extended to a place of public amusement at pleasure resorts, in which concerts, theatrical performances and public balls are given, and which usually contains a *café-restaurant* and gaming saloons. “Casino” as an architectural term is still employed in France, and the subject is given in competitive programmes in the French schools of design. In the 18th century in England many Italian examples were built in the parks of country mansions, and Sir William Chambers in his treatise on civil architecture publishes plates of the casinos he had built at Marino, near Dublin, Wilton near Salisbury, and Birdshall, Yorkshire.

Casino or *Cassino* is also the name given to a game of cards of obscure origin, played with a full whist-pack. The object is to take as many cards as possible, particularly such as have special value. It may be played by two, three or four persons, partners sitting opposite one another. The player at the dealer’s right is called the pony (*pone*), the one at his left the eldest hand. The dealer (selected by the cut of the lowest card) deals four cards to each player by twos and also, just before dealing to himself, four to the table, face upwards. The eldest hand begins the game by playing a card in one of three ways. Either he may take one of the exposed cards on the table by matching it with one from his own hand; or he may put one of his cards upon one of the table hand and call the sum of the pips (called *building*); or thirdly, failing to do either of these things, he must *trail*, *i.e.* lay a card face upwards on the table beside the exposed cards, and the player at his left then plays in his turn. When each player has played out all four of his cards the dealer deals four more all round, and the game proceeds until the pack is exhausted. The game either (1) ends at this juncture, the player having secured the most points winning; or (2) the side or player first securing 21 points wins; or (3) the points secured in a given number of deals may determine the winner. The points and their respective values are as follows:—*Big* (or Great) *Casino* (ten of diamonds), 2; *Little Casino* (deuce of spades), 1; *Cards* (greatest number), 3; *Spades* (greatest number), 1; *Aces*, 1 each or 4 together; *Sweeps* 1 each. Thus, without *sweeps*, the maximum points in one deal are 11. A sweep is a play that clears the table of all exposed cards. The game then proceeds by the next player placing a card on the table face upwards.

> “Building,” referred to above, is done as follows. Should a 3 lie exposed on the table, a player may place a 4 upon it, saying, “I build a 7,” and, if it is not disturbed before his next turn, he may then take the two cards with another 7 from his hand. It follows that no combination may be built unless the builder holds the proper card in his hand. But a build may be increased. Thus, in the case cited above, another player may put a 2 upon the two cards which make 7 and say, “I build 9,” in which case the original builder loses control of the build unless he also holds a 9 in his hand or can himself increase the build again; for instance, adding an ace and calling 10. In the old way of playing the ace counted 1, the deuce 2, and so on as at whist, excepting that all court cards counted 10. But in the popular variation called *Royal Casino*, now almost universally played, the ace counts either 1 or 14, the king 13, the queen 12 and the knave 11. In this manner the opportunities for simple and increased building are greatly multiplied, resulting in a much livelier game.
>
> If a player has made a build he must take it in on his next play, unless he can take some other card. He cannot have two builds on the table at the same time, nor increase another build if he already has one of his own. *Double Builds* cannot be increased, *e.g.* if a player combines a 3 and 4 lying on the table and places a 7 from his hand upon them, saying, “I build sevens,” this build can be taken only with a 7, and cannot be built upon further. Of course in the case cited the builder must still have another 7 in his hand. In playing partners each may take in the other’s builds, or may build to a card that has been declared by his partner; *e.g.* if his partner has built an 8 that has been captured by an opponent, he may build another 8 with a card from his own hand to the 8 that he knows to be in his partner’s hand, even though he has no 8 himself. In *trailing*, *i.e.* laying down a card without matching or building, one usually plays small cards, avoiding aces and (if Big and Little Casino have not yet been played) tens and deuces, as well as any cards one has reason to think will be of service to the enemy. High cards are usually played last, as they are stronger in taking combinations. Such rules are, however, quite general, each situation calling for special treatment. In the last round all cards remaining on the table become the property of the player taking the last trick. A good memory and keen powers of observation are essential in playing this game.
>
> In *Twenty-One-Point Casino* nothing is scored until the end of the deal. A second or third deal is usually necessary before one side scores the requisite 21. In the final deal each side keeps a mental count of the points made, and as soon as 21 are scored the game is claimed and the points shown. But if, when added to those already scored in previous deals, they make more or less than 21, the claimant loses the game. In counting out *cards* count first, followed by *spades, Big Casino, Little Casino, aces* and *sweeps*, in that order.

Spade Casino is a variation in which the usual 11 points count as in the regular game, and, in addition, each spade counts 1, excepting the knave of spades, which counts 2, making 24 points in all. These are scored on a cribbage-board, each point being marked as it is made. The game is for 61 points, or once round the board and into the game-hole.

CASINUM, an ancient town of Italy, probably of Volscian origin. Varro states that the name was Sabine, and meant *forum vetus*, and also that the town itself was Samnite, but he is probably wrong. When it came under Roman supremacy is not known, but it probably received the citizenship in 188 B.C. It was the most south-easterly town in *Latium adjectum*, situated on the Via Latina about 40 m. N.W. of Capua. It appears occasionally in the history of the Hannibalic War. Varro possessed a villa near it, in which later on Mark Antony held his orgies. Towards the end of the republic it was a *praefectura*, and under the empire it appears as a colony (perhaps founded by the triumvirs), though in two (not local) inscriptions it is called *municipium*. Strabo speaks of it as an important town; Varro mentions the olive-oil of its district as especially good. The older Volscian Casinum must have stood on the hill (1715 ft.) above the Roman town (148 ft.), where considerable remains of fortifications in Cyclopean masonry, of finely cut blocks of limestone, still exist. The site is now occupied by the Benedictine monastery of Monte Cassino (*q.v.*) founded by St Benedict himself in 529. A number of Roman inscriptions from Casinum are preserved there. The wall which runs south-west and west starting from the west side of the monastery, for a total length of about 300 yds., is not so clearly traceable on the other side of the hill, though there is one fragment under the east side of the monastery; but it seems to have defended the summit and was perhaps the original acropolis. The Roman town lay at the foot of the mountain, close to the Via Latina. The amphitheatre, erected by Ummidia Quadratilla (whose passion for actors is mentioned by Pliny, *Epist.* vii. 24, on the occasion of her death at the age of about eighty), is still existing: it is built of *opus reticulatum* and the five entrances are by arches of larger blocks of stone; it is approximately circular in plan. The external walls are 59 ft. high. The seats in the interior have disappeared. Above it on the hillside is a theatre of *opus reticulatum*, less well preserved. Close by is a building converted into the Cappella del Crocefisso, originally perhaps a tomb in the Via Latina; it is a chamber in the form of a Greek cross, constructed of large masses of travertine, with a domed roof of the same material. On the opposite bank of the Rapido are the ruins called Monticelli, attributed to the villa of Varro, a part of which was frequently drawn by the architects of the 16th century (T. Ashby in *Papers of the British School at Rome*, ii. 19). The medieval town of S. Germano, which resumed the name Cassino in 1871, lies a little to the north. The cathedral was founded in the 8th century, but the present building was constructed in the 17th century. The church of S. Maria delle Cinque Torri contains twelve ancient marble columns; above the town is a picturesque medieval castle.

(T. As.)

CASIRI, MIGUEL (1710-1791), a learned Maronite, was born at Tripoli (Syria) in 1710. He studied at Rome, where he lectured on Arabic, Syriac, Chaldee, philosophy and theology. In 1748 he went to Spain, and was employed in the royal library at Madrid. He was successively appointed a member of the Royal Academy of History, interpreter of oriental languages to the king, and joint-librarian at the Escorial. In 1763 he became principal librarian, a post which he appears to have held till his death in 1791. Casiri published a work entitled *Bibliotheca Arabico-Hispana Escurialensis* (2 vols., Madrid, 1760-1770). It is a catalogue of above 1800 Arabic MSS., which he found in the library of the Escorial; it also contains a number of quotations from Arabic works on history. The MSS. are classified according to subjects; the second volume gives an account of a large collection of geographical and historical MSS., which contain valuable information regarding the wars between the Moors and the Christians in Spain. Casiri's work is not yet obsolete, but a more scientific system is adopted in Hartwig Derenbourg's incomplete treatise, *Les Manuscrits arabes de l'Escorial* (Paris, 1884).

CASKET, a small box or coffer, commonly used for jewels, money, papers, or other objects of value. The etymology is doubtful. It is possibly a diminutive of “cask,” a barrel for wine or other liquor. The Spanish *casco* meant also a skull, helmet, or rind of an onion, and is probably connected with *cascar*, to break open, Latin *quassare*, French *casser*, to break, shake. The French *casque, casquet*, of the same origin is only used of a helmet, and the sense of “small chest” is not found in languages other than English. Skeat suggests that the word is a corruption of French *cassette*, diminutive of *casse*, box, Latin *capsa*, from *capere*, to hold, contain, cf. English “case.” History and literature are full of references to the often disconcerting contents of these famous receptacles. The “Casket Letters” (*q.v.*) are one of the mysteries of history. Harpagnon’s casket plays an important part in Molière’s *L’Avare*; Bluebeard gives his too-curious wife the keys of his caskets filled with precious stones; the contents of Sainte-Croix’s casket brought about the trial and condemnation of the marquise de Brinvilliers, the poisoner. This very ancient piece of furniture was no doubt derived from the chest, which was the original wardrobe. It was often an object of great value, covered with ivory, enamel, or stamped leather, enriched with precious metals, or encrusted with jewels. One which belonged to St Louis and is preserved in the Louvre is covered with enamelled shields of arms and other decorations. In the 16th and 17th centuries secret hiding-places were sometimes in the thickness of the lid or in a false bottom. The word is now little used—the natural result of the desuetude of the object; but auctioneers occasionally announce that they will sell a “casket of jewels,” and undertakers, especially in the United States, frequently use it as a grandiose synonym for “coffin.”

CASKET LETTERS. This is the name generally given to eight letters, and a sequence of irregular sonnets, all described as originally in French, and said to have been addressed by Mary, queen of Scots, to the earl of Bothwell, between January and April 1566-1567. The nature of these documents—authentic, forged, or partly forged, partly genuine—has been the theme of much discussion. If authentic throughout, they afford perfect proof of Mary’s complicity in the murder of her husband, Henry, Lord Darnley. The topic is so perplexing, and possibilities are so delicately balanced, that inquirers may change their views, and modify or reverse their opinions, on the appearance of each fresh document that is brought to light; or even upon a new consideration of existing evidence. Controversy centres round a very long and singular undated epistle called “The Glasgow Letter” or “Letter II.” If Mary wrote all of this, or even wrote some compromising parts of it, she was certainly guilty. But two questions remain to be settled—(1) did her accusers at one time possess another version of this letter which if it existed was beyond doubt a forgery? and (2) is not part of Letter II. a forged interpolation, based on another document, not by Mary?

The whole affair has been obscured and almost inextricably entangled, as we shall see, by the behaviour of Mary’s accusers. Of these Maitland of Lethington was consenting to Darnley’s murder; the earl of Morton had, at least, guilty foreknowledge; the regent Moray (Mary’s natural brother) had “looked through his fingers” at the crime, and for months remained on intimate terms with the criminals. He also perjured himself when putting before Elizabeth’s commission of inquiry at Westminster (December 1568) a copy of the confession of Hepburn of Bowton (Cotton MSS. British Museum. Caligula C.I. fol. 325). This is attested as a “true copy,” but Moray, who had been present when Bowton was examined (December 8, 1567), knew that the copy presented at Westminster (December 1568) had been mutilated because the excised passages were damning to Lethington and the earl of Morton, accomplices in the crime of Darnley’s murder, and accomplices of Moray in his prosecution of his sister. (See in Cambridge University Library, MS. Oo. 47, fol. 5 et seq. Compare the MS. copy of the confession in the British Museum, Cotton MSS. Caligula, C.I. fol. 325, printed in Anderson’s *Collections*, vol. ii. pp. 183-188.)

If Moray the righteous could act thus, much more might the murderer Morton perjure himself in his averment that there had been no tampering with the Casket Letters in his custody. We cannot, in short, believe Mary’s accusers on their oaths. When they all went, in October-December 1568, to York and London to accuse their queen—and before that, in their

proclamations—they contradicted themselves freely and frequently; they put in a list of dates which made Mary's authorship of Letter II. impossible; and they rang the changes on Scots translations of the alleged French originals, and on the French itself. For example, when Moray, after Mary was in Elizabeth's power (May 16, 1568), wished Elizabeth to have the matter tried, he in May-June 1568 sent John Wood to England with Scots translations of the letters. Wood was to ask, "if the French originals are found to tally with the Scots translations, will that be reckoned good evidence?" It was as easy to send copies of the French, and thus give no ground for the suspicion that the Scots letters were altered on the basis of information acquired between May and October 1568, and that the French versions were made to fit the new form of the Scots copies. Another source of confusion, now removed, was the later publication in France of the letters in French. This French did not correspond with French copies of some of the originals recently discovered in Cecil's MSS. and elsewhere. But that is no ground of suspicion, for the published French letters were not copies of the alleged originals, but translations of Latin translations of them, from the Scots (see T.F. Henderson, *The Casket Letters*, 1890). German historians have not made matters more clear by treating the Letters on the principle of "the higher criticism" of Homer and the Bible. They find that the documents are of composite origin, partly notes from Mary to Darnley, partly a diary of Mary's, and so on; all combined and edited by some one who played the part of the legendary editorial committee of Peisistratus (see HOMER), which compiled the *Iliad* and *Odyssey* out of fragmentary lays! From all these causes, and others, arise confusion and suspicion.

So much information unknown to older disputants such as Goodall, the elder Tytler, Chalmers, and Malcolm Laing, and in certain cases unknown even to Froude and Skelton, has accrued, that the question can now best be studied in *The Casket Letters*, by T.F. Henderson (1889; second issue, 1890, being the more accurate); in *The Mystery of Mary Stuart*, by Andrew Lang (4th edition, 1904), and in Henderson's criticism of that book, in his *Mary, Queen of Scots* (1905) (Appendix A). The conclusion arrived at here is that of Henderson, but it is reached independently.

The history of the letters must be given in summary. Henderson, in *The Casket Letters* (1889), was the first to publish and use as evidence a document of which the existence was made known in the fifth report of the royal commission on historical manuscripts. It is a sworn statement of the earl of Morton, written in 1568. A silver casket (originally Mary's property, but then in the possession of Bothwell) was placed in his hands on the 20th of June, and was inspected by several nobles and gentlemen on the 21st of June 1567. Morton denies that the contents, the letters, sonnets, and some other papers, had been in any way tampered with. But if Moray could knowingly submit garbled evidence, Morton's oath is of no value if uncorroborated.

Mary was, on the 21st of June 1567, a prisoner in Loch Leven Castle. A messenger was at once sent from Edinburgh to London with a letter from Lethington and a verbal message. By the 12th of July, de Silva, the Spanish ambassador, reports on the authority of the French ambassador that du Croc, French envoy to Scotland, avers that Mary's Scottish enemies have autograph letters of hers proving her guilt, and himself possesses copies. Of these copies no more is heard, and they cannot be found. According to de Silva, Elizabeth said that she did not believe in the Letters, and that Lethington, who wrote to Cecil on the 21st of June, and sent a verbal message by the bearer, "had behaved badly in the matter,"—whether that of the letters, or in general. On what evidence she based that opinion, if she really held it, is unknown. In December 1567 the Scottish parliament was informed that the letters were *signed* by Mary (they are unsigned), but the phrase is not used in the subsequent act of parliament. The letters were exhibited and apparently were read, probably read aloud. Mary's party in September 1568 declared that they were garbled, and that the handwriting was not hers. In the end of July 1567 the earl of Moray, Mary's brother, passing through London from France, told de Silva, as de Silva reported to his government, that there was proof of Mary's guilt in a letter of three double sheets of paper *signed* by her.

According to Moray's version of the letter, Mary was to try to poison Darnley in a house on the way between Glasgow and Edinburgh where he and she were to stop. Clearly Lord Livingstone's house, Callendar, where they did rest on their journey, is intended. If this failed, Mary would put Darnley "in the house where the explosion was arranged for the night upon which one of the servants was to be married." No such arrangement had been made, as the confessions of the murderers, at which Moray was present, clearly prove. It may be said that de Silva means "the house in which the explosion was *afterwards* arranged." But the earl of Lennox, Darnley's father, understood Moray to mean that as early as January 21-22, 1567, the house of Kirk o' Field, where Darnley was slain, had already been mined. Moray's version of the letter made Mary tell Bothwell to poison or put away his wife. No such matters occur

in Letter II.; Moray spoke, he said, on the authority of “a man who had read the letter.” A similar account of this letter is given in a document of Darnley’s father, the earl of Lennox (Cambridge University Library MSS. Oo. 7. 47; f. 17 b.). Can we suppose that “the man who had read the letter” invented much of its contents, and told them to Moray, who told de Silva, and told Darnley’s father, Lennox, then in or near London?

At this point comes in the evidence—unknown to Froude, Skelton, Hosack, and Henderson in his book *The Casket Letters*—of a number of documents, notes of information, and indictments of Mary, written for or by the earl of Lennox. These MSS are in the University Library of Cambridge, and were transcribed by Father Stevenson. His transcripts were brought to light by Father Pollen, S.J., who lent them, with his own notes on them, to Andrew Lang for use in his book, *The Mystery of Mary Stuart* (1900-1904).

Not one of the Lennox documents is dated; all but one are endorsed in an English hand of the period. It may be conjectured that they were selected by Lennox from his papers, and lent by him to some one who was writing against Mary. Among them (Cambridge University MSS. Oo. 7. 47. fol. 17 b.) is a long indictment of Mary, in which Lennox describes a wicked letter of hers. As has been said, he closely follows Moray’s version reported by de Silva in July 1567. Lennox also gives several stories of cruel words of Mary spoken to Darnley in the hearing of her servants.

Now, on the 11th of June 1568, Lennox was in the company of John Wood, a creature of Moray’s, and Wood, as we saw, brought copies of the Scots renderings of the Letters into England in May-June 1568. It was argued by Andrew Lang that Wood was likely to show these letters to Lennox; and that as Lennox follows Moray’s version of Mary’s long and murderous letter, and does *not* follow Letter II., the murderous letter (a forgery) was then part of the *dossier* of Mary’s accusers. Again, as Lennox’s indictment of Mary (Cambridge Oo. 7. 47. fol. 17 b.) is rife in “reports and sayings of Mary’s servants” about her cruel words to Darnley, and as Lennox had not these reports on the 11th of June 1568, for on that day he wrote to Scotland asking his friends to discover them and send them to him, the indictment (Oo. 7. 47) must have been composed long after the 11th of June. This must be so, for Lennox’s letters of the 11th of June were intercepted by his foes, the Hamiltons, and were found in the Hamilton Muniment Room. Thus answers to his inquiries were delayed. (The letters of Lennox were published in *Miscellany of the Maitland Club*, vol. iv.)

Henderson, on the other side, believes that Wood “indubitably” showed to Lennox the Scots copies of the Casket Letters about the 11th of June 1568. But Lennox, he says, could not quote Letter II. in his indictment against Mary, and had to rest on Moray’s version of July 1567, because Lennox’s indictment was completed, and even laid before Elizabeth, as early as the 28th of May 1568. Henderson seeks to prove that this is so by quoting from Chalmers’s *Mary Queen of Scots* (vol. ii. p. 289) the statement that Lennox and his wife on that day presented to Elizabeth a “Bill of Supplication”; and (though he submits that the indictment [Oo. 7. 47] is a *draft* for the Bill) he strengthens his case by heading the indictment, which he publishes, *Bill of Supplication*. The document, in fact, is unendorsed, and without a title, and there is not a word of “supplication” in it. It is a self-contradictory history of the relations between Mary and Darnley.

Henderson’s contention therefore seems erroneous. Lennox could not begin to prepare an English indictment against Mary till she was in England and in Elizabeth’s power. He could not hear of this fact—Mary’s arrival in England (May 16, 1568)—before, say, the 19th of May; and between the 19th of May and the 28th of May he could not write for and receive from Scotland “the reports and sayings of her servants.” He did not possess them on the 11th of June, when he asked for them; he did not get them at once, for his letters were intercepted; the indictment (Oo. 7. 47) is rich in them; therefore that paper is not the “Bill of Supplication” of the 28th of May.

Thus the question remains, why, if Wood about the 11th of June showed to Lennox Letter II. in Scots, did Lennox follow Moray’s erroneous version of July 1567? Because in June 1568 that version, forged, was in the Scots collection of the Casket Letters? If so, there was time for Lennox to lend to the accusers certain notes which a retainer of his, Thomas Crawford of Jordan Hill, swore (December 9, 1568) that he had made for Lennox (about January 22, 1567) of secret conversations between Darnley and Mary. Lennox (June 11, 1568) asked Crawford for his reminiscences, *not* of Darnley’s reports of his talks with Mary, but of Crawford’s own interview with her as she entered Glasgow to visit Darnley, probably on the 21st of January 1567. It follows that Lennox possessed Crawford’s written notes of the Darnley and Mary conversations. If he had not possessed them on the 11th of June 1568, he must have asked Crawford for his reminiscences of these talks. But he did not ask.

Crawford's evidence was all-important, because it corroborated Mary's own account of her interviews with Darnley in Letter II. That part of the letter then, it is argued by many, is a forged interpolation based on Crawford's notes and memories. The force of this contention lies in the close verbal identities between Crawford's account of the Darnley-Mary interviews (see Crawford's Declaration of December 9, 1568, in Lang's *Mystery of Mary Stuart*, pp. 428-431; from *State Papers Scotland*, Elizabeth vol. xiii. No. 14. Record Office) and the corresponding passages in Letter II. (*Mystery of Mary Stuart*, pp. 396-398). The verbal identities can only be explained in one of the following ways. Either Letter II. is here based on Crawford; or Crawford has copied Letter II. by way of corroborating it (a fatal step, if the case came before a modern English court of justice); or Darnley's memory of his conversation with Mary was so fresh, when he dictated his recollection of it to Crawford on 21st-22nd January 1567, that he reported speeches in almost the very same words as Mary used in writing Letter II. Henderson prefers the hypothesis that Lennox had lost Crawford's notes; and that the identities are explained by the "remarkably good memories of Crawford and Mary, or by the more likely supposition that Crawford, before preparing his declaration for the conference" (at Westminster, December 1568) "refreshed his memory by the letter." (Letter II., *Mary Queen of Scots*, p. 650.)

Mary did not need a particularly good memory; if she wrote, she wrote unchecked her recollections of the day's talk. But no human memory of a conversation reported on the 22nd of January 1567, could be so nearly "word perfect" as Crawford's must have been two years later. If Crawford "refreshed his memory by the letter," he exposed himself, and the entire case, by copying whole passages, often with few verbal changes. If he had access to his original notes of the 21st and 22nd of January 1567, then he was safe—that is, if Darnley's memory of the conversations tallied so exactly with Mary's. Whether that could be, Darnley dictating while still hot from the exciting interchange of words which he meant to report, is a question for psychologists. Experiments made by a person who possesses a good memory seem to show that the thing is very possible, especially if Darnley revised Crawford's notes.

Thus the probabilities are delicately balanced. But if any one compares Crawford's whole declaration with Letter II. in Scots, he will find that Crawford has sources of information not yielded by Letter II.; while Letter II. abounds in matter spoken by Mary and Darnley which could not be borrowed by the hypothetical forger from Crawford's Declaration, for it does not contain the facts. These facts, again, in Letter II., are worthless to a forger, because they concern matters never alluded to in any of the records; never employed in any indictment (though Lennox's are copious in private talk between Darnley and Mary, "reports of her servants "), and totally useless for the purposes of the accusers. Here is one of several examples. Letter II. has, and Crawford has not, the statement that Darnley "showed me, amongst other talk, that he knew well enough that my brother had revealed to me what he (Darnley) had spoken at Stirling. Of this he (Darnley) denies half, and above all that he (the brother?) ever came to his (Darnley's) chamber."

Nothing is known about this matter. The Lennox papers are full of reports of bitter words that passed between Darnley and Mary at Stirling (December 1566), where Darnley was sulking apart while the festivities of the baptism of his son (later James VI.) were being held. But nothing is said in the Lennox papers of words spoken by Darnley to Mary's brother (probably Lord Robert of Holyrood) and revealed by Lord Robert to Mary. Lord Robert was the only friend of Darnley in Mary's entourage; and he even, according to the accusers, warned him of his danger in Kirk o' Field, to which they said that a Casket Letter (III.) referred. The reference is only to be seen by willing eyes.

Is it credible that a forger, using Crawford's Declaration, which is silent as to Mary's brother at Stirling, should have superfluously added what is not to any purpose? Could he have combined with Crawford's matter the passage "he (Darnley) showed me almost all that is in name of the Bishop and Sutherland, and yet I have never touched a word of what you (Bothwell) showed me ... and by complaining of the Bishop, I have drawn it all out of him."

Who but Mary herself could have written about this unknown affair of the Bishop, and what had the supposed forger to gain by inventing and adding these references to affairs unconnected with the case?

There remains what looks like absolute proof that, in essence, Crawford's Declaration and Letter II. are independent documents. We are not aware that this crucial point has been noticed by the earlier critics of the Letters. In Letter II. (paragraph 7, p. 398, in Lang's *Mystery of Mary Stuart*, 1901) Mary writes, "I asked why he (Darnley) would pass away in the English ship. He denies it, and swears thereunto; but he grants that he spoke unto the men." Here Crawford's declaration has, "She asked him why he would pass away in the English ship. He answered that he had spoken with the Englishman, but not of mind to go

away with him. And, if he had, it had not been without cause, considering how he was used. For he had neither [means] to sustain himself nor his servants, and need not make further rehearsal thereof, seeing she knew it as well as he." (*Mystery of Mary Stuart*, p. 429.)

It may seem to the reader doubtful whether these complaints are words of Darnley's, or an indignant addition by his friend Crawford. But Mary, in Letter II., shows that the complaints and the self-defence are Darnley's own. It was in paragraph 7 that she wrote about the English ship; she did not then give Darnley's remonstrances, as Crawford does. But in paragraph 18 (*Mystery*, p. 406) Mary returns to the subject, and writes, "He (Darnley) spoke very bravely at the beginning, as the bearer will show you, upon the subject of the Englishmen, and of his departing; but in the end he returned to his humility."

Thus it is certain that Darnley had reported to Crawford his brave words and reproaches of Mary, which Crawford gives in the proper place. But Letter II. omits them in that place (paragraph 7); and only on her second day of writing, in paragraph 18, does Mary's mind recur to Darnley's first brave words—"he spoke very bravely at the beginning," about his wrongs, "but in the end he returned again to his humility."

Here is proof positive that Crawford does not copy Letter II., but gives Darnley's words as reported to him by Darnley—words that Darnley was proud of,—while Mary, returning on the second day of writing to the topic, does not quote Darnley's brave words, but merely contrasts his speaking "very bravely at the beginning" with his pitiful and craven later submission; "he has ever the tear in his eye," with what follows. (*Mystery*, paragraph 12, p. 402.)

When we add to these and other proofs the strange lists of memoranda in the middle of the pages of the letter, and the breach in internal chronology which was apparently caused by Mary's writing, on her second day, on the clean verso of a page on the other side of which she had written some lines during her first night in Glasgow; when we add the dramatic changes of her mood, and the heart-breaking evidence of a remorse not stifled by lawless love, we seem compelled to believe that she wrote the whole of Letter II.; that none of it is forged.

In *The Mystery of Mary Stuart* the evidence for an early forged letter was presented with confidence; the interpolation of forgeries based on Crawford's declaration was more dubiously suggested. That position the writer now abandons. It may be asked why, after being with Wood on the 11th of June, did Lennox still rely on Moray's version of Mary's letter? The reply may be that the Scots versions were regarded as a great secret; that Lennox was a married man; and that though Lennox in June knew about Mary's letters, doubtless from Wood, or from common report (Bishop Jewell in a letter of August 1567 mentions that he had heard of them), yet Wood did not show to him the Scots copies. Lennox quotes Letter II. later, in an indictment to be read to the commission sitting at York (October 1568). But, on the other hand, as Lennox after meeting Wood wrote to Crawford for his reminiscences of his own interview with Mary (January 21, 1567), and as these reminiscences were only useful as corroborative of Mary's account in Letter II., it seems that Wood had either shown Lennox the letters or had spoken of their contents. In that case, when Lennox later quotes Moray's version, not Letter II. itself, he is only acting with the self-contradictory stupidity which pervades his whole indictment (Oo. 7. 47. fol. 17 b.).

The letters are not known to have been seen by any man—they or the silver casket—after the death of the earl of Gowrie (who possessed them). In May 1584 Bowes, the English ambassador to Holyrood, had endeavoured to procure them for Elizabeth, "for the secrecy and benefit of the cause." Conceivably the letters fell into the hands of James VI. and were destroyed by his orders.

(A. L.)

CASLON, the name of a famous family of English typefounders. William Caslon (1692-1766), the first of the name, was born at Cradley, Worcestershire, and in 1716 started business in London as an engraver of gun locks and barrels, and as a bookbinder's tool-cutter. Being thus brought into contact with printers, he was induced to fit up a type foundry, largely through the encouragement of William Bowyer. The distinction and legibility of his type secured him the patronage of the leading printers of the day in England and on the continent. The use of Caslon types, discontinued about the beginning of the 19th century,

was revived about 1845 at the suggestion of Sir Henry Cole, and used for printing the *Diary of Lady Willoughby* (a pseudo-17th-century story) by the Chiswick Press. The headline on this page is “Caslon Old Face.” He died on the 23rd of January 1766. His son, William Caslon (1720-1778), who had been partner with his father for some years, continued the business.

CASPARI, KARL PAUL (1814-1892), German Lutheran theologian and orientalist, was born of Jewish parents at Dessau, Anhalt, on the 8th of February 1814. He studied at Leipzig and Berlin, became a Christian in 1838, and in 1857 was appointed professor of theology at Christiania, having declined invitations to Rostock and Erlangen. He died at Christiania on the 11th of April 1892. Caspari is best known as the author of an Arabic grammar (*Grammatica Arabica*, 2 vols., 1844-1848; new edition, *Arabische Grammatik*, edited by A. Müller; 5th ed. 1887). He also wrote commentaries on the prophetical books of the Old Testament, dogmatic and historical works on baptism, and from 1857 helped to edit the *Theologisk Tidskrift for den evangelisk-lutherske Kirke i Norge*. His writings include: *Beiträge zur Einleitung in Jesaja* (1848), and *Alte und neue Quellen zur Geschichte des Taufsymbols und der Glaubensregel* (1879).

CASPIAN SEA (anc. *Mare Caspium* or *Mare Hyrcanium*; Russian, *Kaspiyskoe More*, formerly *Hvalynskoe More*; Persian, *Darya-i-Khyzyr* or *Gurzem*; Tatar, *Ak-denghiz*; the *Sikim* and *Jurjan* of the ancient Eastern geographers), an inland sea between Europe and Asia, extending from 36° 40′ to 47° 20′ N. lat., and from 46° 50′ to 55° 10′ E. long. Its length is 760 m. from N. to S., and its breadth 100 to 280 m., and its area reaches 169,330 sq. m., of which 865 sq. m. belong to its islands. It fills the deepest part of a vast depression, sometimes known as the Aralo-Caspian depression, once an inland sea, the Eurasian Mediterranean or Sarmatian Ocean. At the present time its surface lies 86 ft. below the level of the ocean, or 96.7 ft. according to the Aral-Caspian levelling[1] and 242.7 ft. below the level of the Aral.

Hydrography and Shores.—The hydrography of the Caspian Sea has been studied by von Baer, by N. Ivashintsev (1819-1871) in 1862-1870, by O. Grimm, N.I. Andrusov (1895), and by J.B. Spindler (1897), N. von Seidlitz and N. Knipovich (1904) since the last quoted date. Its basin is divided naturally into three sections—(1) A northern, forming in the east the Gulf of Mortvyi Kultuk or Tsarevich Bay. This is the shallowest part, barely reaching a depth of 20 fathoms. It is being gradually silted up by the sedimentary deposits brought down by the rivers Volga, Ural and Terek. The western shore, from the delta of the Volga to the mouth of the Kuma, a distance of 170 m., is gashed by thousands of narrow channels or lagoons, termed *limans*, from 12 to 30 m. in length, and separated in some cases by chains of hillocks, called *bugors*, in others by sandbanks. These channels are filled, sometimes with sea-water, sometimes with overflow water from the Volga and the Kuma. The coast-line of the Gulf of Mortvyi Kultuk on the north-east is, on the other hand, formed by a range of low calcareous hills, constituting the rampart of the Ust-Urt plateau, which intervenes between the Caspian and the Sea of Aral. On the south this gulf is backed by the conjoined peninsulas of Busachi and Manghishlak, into which penetrates the long, narrow, curving bay or fjord of Kaidak or Kara-su. (2) South of the line joining the Bay of Kuma with the Manghishlak peninsula, in 44° 10′ N. lat., the western shore is higher and the water deepens considerably, being over one-half of the area 50 fathoms, while the maximum depth (between 41° and 42° N. lat.) reaches 437 fathoms. This, the middle section of the Caspian, which extends as far as the Apsheron peninsula, receives the Terek and several smaller streams (*e.g.* Sulak, Samur), that drain the northern slopes of the Caucasus. At Derbent, just north of 42° lat., a spur of the Caucasus approaches so close to the sea as to leave room for only a narrow passage, the *Caspiae Pylae* or *Albanae Portae*, which has been fortified for centuries. The eastern shore of this section of the sea is also formed by the Ust-Urt plateau, which rises 550 ft. to 750 ft. above the level of the Caspian; but in 42° N. lat. the Ust-Urt recedes from the Caspian and circles round the Gulf of Kara-boghaz or Kara-bugaz (also called Aji-darya and Kuli-darya). This subsidiary basin is separated from the Caspian by a narrow sandbar, pierced by a strait 1¼ m. long and only 115 to 170 yds. wide, through which a current flows continuously into the gulf at the

rate of 1½ to 5 m. an hour, the mean velocity at the surface being 3 m. an hour. To this there exists no compensating outflow current at a greater depth, as is usually the case in similar situations. The area of this lateral basin being about 7100 sq. m., and its depth but comparatively slight (3½ to 36 ft.), the evaporation is very appreciable (amounting to 3.2 ft. per annum), and sufficient, according to von Baer, to account for the perpetual inflow from the Caspian. South of the Kara-Boghaz Bay the coast rises again in another peninsula, formed by an extension of the Balkhan Mountains. This marks (40° N. lat.) the southern boundary of the middle section of the Caspian. This basin may be, on the whole, considered as a continuation of the synclinal depression of the Manych, which stretches along the northern foot of the Caucasus from the Sea of Azov. It is separated from (3), the southern and deepest section of the Caspian, by a submarine ridge (30 to 150 fathoms of water), which links the main range of the Caucasus on the west with the Kopet-dagh in the Transcaspian region on the east. This section of the sea washes on the south the base of the Elburz range in Persia, sweeping round from the mouth of the Kura, a little north of the Bay of Kizil-agach, to Astarabad at an average distance of 40 m. from the foot of the mountains. A little east of the Gulf of Enzeli, which resembles the Kara-boghaz, though on a much smaller scale, the Sefid-rud pours into the Caspian the drainage of the western end of the Elburz range, and several smaller streams bring down the precipitation that falls on the northern face of the same range farther to the east. Near its south-east corner the Caspian is entered by the Atrek, which drains the mountain ranges of the Turkoman (N.E.) frontier of Persia. Farther north, on the east coast, opposite to the Bay of Kizil-agach, comes the Balkhan or Krasnovodsk Bay. In the summer of 1894 a subterranean volcano was observed in this basin of the Caspian, in 38° 10′ N. lat. and 52° 37′ E. long. The depth in this section ranges from 300 to 500 fathoms, with a maximum of 602 fathoms.

Drainage Area and Former Extent.—The catchment area from which the Caspian is fed extends to a very much greater distance on the west and north than it does on the south and east. From the former it is entered by the Volga, which is estimated to drain an area of 560,000 sq. m., the Ural 96,000 sq. m., the Terek 59,000 sq. m., the Sulak 7000 sq. m., the Samur 4250 sq. m.; as compared with these, there comes from the south and east the Kura and Aras, draining the south side of the Caucasus over 87,250 sq. m., and the Sefid-rud and the Atrek, both relatively short. Altogether it is estimated (by von Dingelstedt) that the total discharge of all the rivers emptying into the Caspian amounts annually to a volume equal to 174.5 cub. m. Were there no evaporation, this would raise the surface of the sea 5½ ft. annually. In point of fact, however, the entire volume of fresh water poured into the Caspian is only just sufficient to compensate for the loss by evaporation. Indeed in recent times the level appears to have undergone several oscillations. From the researches of Philippov it appears that during the period 1851-1888 the level reached a maximum on three separate occasions, namely in 1868-1869, 1882 and 1885, while in 1853 and 1873 it stood at a minimum; the range of these oscillations did not, however, exceed 3 ft. 6½ in. The Russian expedition which investigated the Kara-boghaz in 1896 concluded that there is no permanent subsidence in the level of the sea. In addition to these periodical fluctuations, there are also seasonal oscillations, the level being lowest in January and highest in the summer.

The level of the Caspian, however, was formerly about the same as the existing level of the Black Sea, although now some 86 ft. below it. This is shown by the evidences of erosion on the face of the rocks which formed the original shore-line of its southern basin, those evidences existing at the height of 65 to 80 ft. above the present level. That a rapid subsidence did take place from the higher level is indicated by the fact that between it and the present level there is an absence of indications of erosive energy. There can be no real doubt that formerly the area of the Caspian was considerably greater than it is at the present time. Nearly one hundred and fifty years ago Pallas had his attention arrested by the existence of the salt lakes and dry saline deposits on the steppes to the east of the Caspian, and at great distances from its shores, and by the presence in the same localities of shells of the same marine fauna as that which now inhabits that sea, and he suggested the obvious explanation that those regions must formerly have been covered by the waters of the sea. And it is indeed the fact that large portions of the vast region comprised between the lower Volga, the Aral-Irtysh water-divide, the Dzungarian Ala-tau, and the outliers of the Tian-shan and Hindu-kush systems are actually covered with Aralo-Caspian deposits, nearly always a yellowish-grey clay, though occasionally they assume the character of a more or less compact sandstone of the same colour. These deposits attain their maximum thickness of 90 ft. east of the Caspian, and have in many parts been excavated and washed away by the rivers (which have frequently changed their beds) or been transported by the winds, which sweep with unmitigated violence across those wide unsheltered expanses. The typical fossils unearthed in these deposits are shells of species now living in both the Caspian and the Aral, though in the shallow parts of both seas only, namely (according to Ivan V. Mushketov [1850-1902])

Cardium edule, Dreissena polymorpha, Neritina liturata, Adacna vitrea, Hydrobia stagnalis, in the Kara-kum desert, and *Lithoglyphus caspius, Hydrobia stagnalis, Anodonta ponderosa* and the sponge *Metchnikovia tuberculata*, in the Kizil-kum desert. The exact limits of the ancient Aralo-Caspian sea are not yet settled, except in the north-west, where the Ergeni Hills of Astrakhan constitute an unmistakable barrier. Northwards these marine deposits are known to exist 80 m. away from Lake Aral, though they do not cross the Aral-Irtysh water-divide, so that this sea will not probably have been at that time connected with the Arctic, as some have supposed. The eastern limits of these deposits lie about 100 m. from Lake Aral, though Severtsov maintained that they penetrate into the basin of Lake Balkash. Southwards they have been observed without a break for 160 m. from Lake Aral, namely in the Sary-kamysh depression (the surface of which lies below the level of the Caspian) and up the 454
Uzboi trench for 100 m. from the latter sea. How far they reach up the present courses of the Oxus (Amu-darya) and Jaxartes (Syr-darya) is not known. Hence, it is plain that in late Tertiary, and probably also in Post-Tertiary, times the Aralo-Caspian Sea covered a vast expanse of territory and embraced very large islands (*e.g.* Ust-Urt), which divided it into an eastern and a western portion, communicating by one or two narrow straits only, such as on the south the Sary-kamysh depression, and on the north the line of the lakes of Chumyshty and Asmantai. More than this, the Caspian was also, it is pretty certain, at the same epoch, and later, in direct communication with the Sea of Azov, no doubt by way of the Manych depression; for in the *limans* or lagoons of the Black Sea many faunal species exist which are not only identical with species that are found in the Caspian, but also many which, though not exactly identical, are closely allied. As examples of the former may be named —*Archaeobdella, Clessinia variabilis, Neritina liturata, Gmelina, Gammarus moeoticus, Pseudocuma pectinata, Paramysis Baeri, Mesomysis Kowalevskyi* and *M. intermedia, Limnomysis Benedeni* and *L. Brandti*, and species of the ichthyological fauna *Gobius, Clupea* and *Acipenser*; while as illustrating the latter class the Black Sea contains *Dreissenia bugensis* (allied to *D. rostriformis* and *D. Grimmi), Cardium ponticum* (to *C. caspium), C. coloratum* (to *Monodacna edentula), Amphicteis antiqua* (to *A. Kowalevskyi*) and *Bythotrephes azovicus* (to *B. socialis*).

In the opinion of Russian geologists the separation of the Caspian from the great ocean must have taken place at a comparatively recent geological epoch. During the early Tertiary age it belonged to the Sarmatian Ocean, which reached from the middle Danube eastwards through Rumania, South Russia, and along both flanks of the Caucasus to the Aralo-Caspian region, and westwards had open communication with the great ocean, as indeed the ancient geographers Eratosthenes, Strabo and Pliny believed it still had in their day. This communication began to fail, or close up presumably in the Miocene period; and before the dawn of Pliocene times the Sarmatian Ocean was broken up or divided into sections, one of which was the Aralo-Caspian sea already discussed. During the subsequent Ice Age the Caspian flowed over the steppes that stretch away to the north, and was probably still connected with the Black Sea (itself as yet unconnected with the Mediterranean), while northwards it sent a narrow gulf or inlet far up the Volga valley, for Aralo-Caspian deposits have been observed along the lower Kama in 56° N. lat. Eastwards it penetrated up the Uzboi depression between the Great and Little Balkhan ranges, so that that depression, which is strewn (as mentioned above) with Post-Tertiary marine deposits, was not (as is sometimes supposed) an old bed of the Oxus, but a gulf of the Caspian. After the great ice cap had thawed and a period of general desiccation set in, the Caspian began to shrink in area, and simultaneously its connexions with the Black Sea and the Sea of Aral were severed.

Fauna.—The fauna of this sea has been studied by Eichwald, Kowalevsky, Grimm, Dybowski, Kessler and Sars. At the present time it represents an intermingling of marine and fresh-water forms. To the former belongs the herring (*Clupea*), and to the latter, species of *Cyprinus, Perca* and *Silurus*, also a lobster. Other marine forms are Rhizopoda (*Rotalia* and *Textillaria*), the sponge *Amorphina*, the *Amphicteis* worm, the molluscs *Cardium edule* and other *Cardidae*, and some Amphipods (*Cumacea* and *Mysidae*,), but they are forms which either tolerate variations in salinity or are especially characteristic of brackish waters. But there are many species inhabiting the waters of the Caspian which are not found elsewhere. These include Protozoa, three sponges, Vermes, twenty-five Molluscs, numerous Amphipods, fishes of the genera *Gobias, Benthophilus* and *Cobitis*, and one mammal (*Phoca caspia*). This last, together with some of the *Mysidae* and the species *Glyptonotus entomon*, exhibits Arctic characteristics, which has suggested the idea of a geologically recent connexion between the Caspian and the Arctic, an idea of which no real proofs have been as yet discovered. The Knipovich expedition in 1904 found no traces of organic life below the depth of 220 fathoms except micro-organisms and a single Oligochaete; but above that level there exist abundant evidences of rich pelagic life, more particularly from the surface down to a depth of 80 fathoms.

Fisheries.—No other inland sea is so richly stocked with fish as the Caspian, especially off the mouths of the large rivers, the Volga, Ural, Terek and Kura. The fish of greatest economic value are sturgeon (four species), which yield great quantities of caviare and isinglass, the herring, the salmon and the lobster. The annual catch of the entire sea is valued at an average of one million sterling. Some 50,000 persons are engaged in this industry off the mouth of the Volga alone. Seals are hunted in Krasnovodsk Bay.

Salinity.—The proportion of salt in the water of the Caspian, though varying in different parts and at different seasons, is generally much less than the proportion in oceanic water, and even less than the proportion in the water of the Black Sea. In fact the salinity of the Caspian is only three-eights of that of the ocean. In the northern section, which receives the copious volumes brought down by the Volga, Ural and Terek, the salinity is so slight (only 0.0075% in the surface layers) that the water is quite drinkable, its specific gravity being not higher than 1.0016. In the middle section the salinity of the surface layers increases to 0.015%, though it is of course greater along the shores. The concentration of the saline ingredients proceeds with the greatest degree of intensity in the large bays on the east side of the sea, and more especially in that of Kara-boghaz, where it reaches 16.3% (Spindler expedition). The bottom of this almost isolated basin is covered for an area of 1300 sq. m. with a deposit of Epsom salts (sulphate of magnesia), 7 ft. thick, amounting to an estimated total of 1,000,000,000 tons. While the proportion of common salt to sulphate of magnesia is as 11 to 1 in the water of the Black Sea and as 2 to 1 in the Caspian water generally, it is as 12.8 to 5.03 in the Kara-boghaz. The salinity of the surface water of the southern section of the Caspian averages 1.5%.

Climate.—The temperature of the air over the Caspian basin is remarkable for its wide range both geographically and seasonally. The January isotherm of 15° F. skirts its northern shore; that of 40° crosses its southern border. But the winter extremes go far below this range: during the prevalence of north-east winds the thermometer drops to -20°, or even lower, on the surrounding steppes, while on the Ust-Urt plateau a temperature of -30° is not uncommon. Again, the July isotherm of 75° crosses the middle section of the Caspian, nearly coinciding with the January isotherm of 25°, while that of 80° skirts the southern shore of the sea, nearly coinciding with the January curve of 40°, so that the mean annual range over the northern section of the sea is 60° and over the southern section 40°. The former section, which is too shallow to store up any large amount of heat during the summer, freezes for three or four months along the shores, effectually stopping navigation on the lower Volga, but out in the middle ice appears only when driven there by northerly winds.

The prevalent winds of the Caspian blow from the south-east, usually between October and March, and from the north and north-west, commonly between July and September. They sometimes continue for days together with great violence, rendering navigation dangerous and driving the sea-water up over the shores. They also, by heaping up the water at the one end of the sea or the other, raise the level temporarily and locally to the extent of 4 to 8 ft. The currents of the Caspian were investigated by the Knipovich expedition; it detected two of special prominence, a south-going current along the west shore and a north-going current along the east shore. As a consequence of this the temperature of the water is higher on the Asiatic than on the European side. The lowest temperature obtained was 35°.24 on the bottom in shallow water, the highest 70°.7 on the surface. But in March the temperature, as also the salinity, was tolerably uniform throughout all the layers of water. Another interesting fact ascertained by the same expedition is that the amount of oxygen contained in the water decreases rapidly with the depth: off Derbent in the middle section of the sea the amount diminished from 5.6 cc. per litre at a depth of 100 metres (330 ft.) to 0.32 cc. per litre at a depth of 700 metres (say 2300 ft.). At the same spot samples of water drawn from the bottom were found to contain 0.3 cc. of sulphuretted hydrogen per litre. In the southern section of the sea the decrease is not so rapid. In this latter section Spindler ascertained in July 1897 that the temperature of the surface water 60 m. from Baku was 72.9°, but that below 10 fathoms it sank rapidly, and at 200 fathoms and below it was constant at 21.2°.

Navigation.—The development of the petroleum industry in the Apeshron peninsula (Baku) and the opening (1886) of the Transcaspian railway have greatly increased the traffic across the Caspian Sea. A considerable quantity of raw cotton is brought from Ferghana by the latter route and shipped at Krasnovodsk for the mills in the south and centre of Russia, as well as for countries farther west. And Russia draws her own supplies of petroleum, both for lighting and for use as liquid fuel, by the sea route from Baku. Other ports in addition to those just mentioned are Astrakhan, on the Volga; Petrovsk, Derbent and Lenkoran, on the west shore; Enzeli or Resht, and Astarabad, on the Persian coast; and Mikhailovsk, on the east coast. The Russians keep a small naval flotilla on the Caspian, all other nations being debarred from doing so by the treaty of Turkmanchai (1828).

At various times and by various persons, but more particularly by Peter the Great, the project has been mooted of cutting a canal between the Volga and the Don, and so establishing unrestricted water communication between the Caspian and the Black Sea; but so far none of these schemes has taken practical shape. In 1900 the Hydrotechnical Congress of Russia discussed the plan of constructing a canal to connect the Caspian more directly with the Black Sea by cutting an artificial waterway about 22 ft. deep and 180 ft. wide from Astrakhan to Taganrog on the Sea of Azov.

See works quoted under ARAL; also von Baer, "Kaspische Studien," in *Bull. Sci. St-Pétersbourg* (1855-1859), and in Erman's *Archiv russ.* (1855-1856); Radde, *Fauna und Flora des sudwestlichen Kaspigebietes* (1886); J.V. Mushketov, *Turkestan* (St Petersburg, 1886), with bibliographical references; Ivashintsev, *Hydrographic Exploration of the Caspian Sea* (in Russian), with atlas (2 vols., 1866); Philippov, *Marine Geography of the Caspian Basin* (in Russian, 1877); *Memoirs of the Aral-Caspian Expedition of 1876-1877* (2 vols, in Russian), edited by the St Petersburg Society of Naturalists; Andrusov, "A Sketch of the Development of the Caspian Sea and its Inhabitants," in *Zapiski of Russ. Geog. Soc.: General Geog.* vol. xxiv.; Eichwald, *Fauna Caspio-Caucasica* (1841); Seidlitz, "Das Karabugas Meerbusen," in *Globus*, with map, vol. lxxvi. (1899); Knipovich, "Hydrobiologische Untersuchungert des Kaspischen Meeres," in *Petermanns Mitteilungen*, vol. l. (1904); and Spindler, in *Izvestia of Russ. Geog. Soc.* vol. xxxiv.

(P. A. K.; J. T. BE.)

1 By the triangulation of 1840 its level was found to be 84 ft. below the level of the Black Sea. The Caucasus triangulation of 1860-1870 gave 89 ft.

CASS, LEWIS (1782-1866), American general and statesman, was born at Exeter, New Hampshire, on the 9th of October 1782. He was educated at Phillips Exeter Academy, joined his father at Marietta, Ohio, about 1799, studied law there in the office of Return Jonathan Meigs (1765-1825), and was admitted to the bar at the age of twenty. Four years later he became a member of the Ohio legislature. During the War of 1812 he served under General William Hull, whose surrender at Detroit he strongly condemned, and under General W.H. Harrison, and rose from the rank of colonel of volunteers to be major-general of Ohio militia and finally to be a brigadier-general in the regular United States army. In 1813 he was appointed governor of the territory of Michigan, the area of which was much larger than that of the present state. This position gave him the chief control of Indian affairs for the territory, which was then occupied almost entirely by natives, there being only 6000 white settlers. During the eighteen years in which he held this post he rendered valuable services to the territory and to the nation; he extinguished the Indian title to large tracts of land, instituted surveys, constructed roads, and explored the lakes and sources of the Mississippi river. His relations with the British authorities in Canada after the War of 1812 were at times very trying, as these officials persisted in searching American vessels on the Great Lakes and in arousing the hostility of the Indians of the territory against the American government. To those experiences was largely due the antipathy for Great Britain manifested by him in his later career. Upon the reorganization of President Jackson's cabinet in 1831 he became secretary of war, and held this office until 1836. It fell to him, therefore, to direct the conduct of the Black Hawk and Seminole wars. He sided with the president in his nullification controversy with South Carolina and in his removal of the Indians from Georgia, but not in his withdrawal of the government deposits from the United States Bank.

In 1836 General Cass was appointed minister to France, and became very popular with the French government and people. In 1842, when the Quintuple Treaty was negotiated by representatives of England, France, Prussia, Russia and Austria for the suppression of the slave trade by the exercise of the right of search, Cass attacked it in a pamphlet entitled "An Examination of the Questions now in Discussion between the American and British Government Concerning the Right of Search," and presented to the French government a formal memorial which was probably instrumental in preventing the ratification of the treaty by France. In this same year the Webster-Ashburton treaty between Great Britain and the United States was concluded, and, as England did not thereby relinquish her claim of the right to search American vessels, Cass, after having taken such a decided stand in this controversy, felt himself in an awkward position, and resigned his post. His attitude on this question made him very popular in America, and he was a strong, but unsuccessful,

candidate for the Democratic nomination for the presidency in 1844. From 1845 to 1848 and from 1849 to 1857 he was a member of the United States Senate, and in 1846 was a leader of those demanding the “re-annexation” of all the Oregon country south of 54° 40′ or war with England, and was one of the fourteen who voted against the ratification of the compromise with England at the 49th parallel. He loyally supported Polk’s administration during the Mexican War, opposed the Wilmot Proviso, and advocated the Compromise Measures of 1850 and the Kansas-Nebraska Bill of 1854. In his famous “Nicholson letter” of December 1847 he made what was probably the earliest enunciation of the doctrine of “popular sovereignty,” namely, that the people of the territories should decide for themselves whether or not they should have slavery.

In 1848 he received the Democratic nomination for the presidency, but owing to the defection of the so-called “Barnburners” (see Free-Soil Party) he did not receive the united support of his party, and was defeated by the Whig candidate, Zachary Taylor. His name was again prominent before the Democratic convention of 1852, which, however, finally nominated Franklin Pierce. On account of his eminently conservative attitude on all questions concerning slavery, General Cass has been accused of pandering to the southern Democrats in order to further his political aspirations. His ideas of popular sovereignty, however, were not inconsistent with the vigorous Democratic spirit of the west, of which he was a typical representative, and it is not clear that he believed that the application of this principle would result in the extension of slavery. As the west became more radically opposed to slavery after the troubles in Kansas, Cass was soon out of sympathy with his section, and when the Republicans secured control of the legislature in 1857 they refused to return him to the Senate. President Buchanan soon afterward made him secretary of state, and in this position he at last had the satisfaction of obtaining from the British government an acknowledgment of the correctness of the American attitude with regard to the right of search (or “visitation,” as Great Britain euphemistically termed it). In December 1860 he retired from the cabinet when the president refused to take a firmer attitude against secession by reinforcing Fort Sumter, and he remained in retirement until his death at Detroit, Michigan, on the 17th of June 1866. He wrote for the *North American* and the *American Quarterly* Reviews, and published *Inquiries Concerning the History, Traditions and Languages of Indians Living Within the United States* (1823), and *France: Its King, Court and Government* (1840).

See W.T. Young, *Life and Public Services of General Lewis Cass* (Detroit, 1852); W.L.G. Smith, *Life and Times of Lewis Cass* (New York, 1856). The best biography is by A.G. McLaughlin, *Lewis Cass* (revised edition, Boston, 1899), in the “American Statesmen” series.

CASSABA, a town of Asia Minor, in the sanjak of Manisa, 63 m. E. of Smyrna, with which it is connected by rail. Pop. estimated at 23,000, of which two-thirds are Mussulman; but the estimate is probably excessive. It has considerable local trade, and exports the products of the surrounding district. Cotton is the most important article, and there are ginning factories in the town; the silkworm is largely raised and exported; and the “melons of Cassaba” are sent not only to Smyrna but to Constantinople. There are fragments of marbles built into the houses, but the modern town does not seem to occupy any ancient site of importance.

CASSAGNAC, BERNARD ADOLPHE GRANIER DE (1806-1880), French journalist, was born at Avéron-Bergelle in the department of Gers on the 11th of August 1806. In 1832 he began his career as a Parisian journalist, contributing ardent defences of Romanticism and Conservatism to the *Revue de Paris*, the *Journal des Débats*, and to *La Presse*. Then he founded a political journal, *L’Époque* (1845-1848), in which his violent polemics in support of Guizot brought him notoriety and not a few duels. In 1851, in the *Constitutionnel*, he declared himself openly an imperialist; and in 1852 was elected as “official candidate” by the department of Gers. As journalist and deputy he actively supported an absolutist policy. He demanded the restoration of religion, opposed the laws in favour of the press, and was a member of the club of the rue de l’Arcade. In March 1868 he accused the Liberal deputies of having received money from the king of Prussia for opposing the emperor, and when called

upon for proof, submitted only false or trivial documents. After the proclamation of the republic (4th of September 1870) he fled to Belgium. He returned to France for the elections of 1876, and was elected deputy. He continued to combat all the republican reforms, but with no advantage to his party. He died on the 31st of January 1880. In addition to his journalistic articles he published various historical works, now unimportant.

His son, Paul Adolphe Marie Prosper Granier de Cassagnac (1843-1904), while still young was associated with his father in both politics and journalism. In 1866 he became editor of the Conservative paper *Le Pays*, and figured in a long series of political duels. On the declaration of war in 1870 he volunteered for service and was taken prisoner at Sédan. On his return from prison in a fortress in Silesia he continued to defend the Bonapartist cause in *Le Pays*, against both Republicans and Royalists. Elected deputy for the department of Gers in 1876, he adopted in the chamber a policy of obstruction "to discredit the republican régime." In 1877 he openly encouraged MacMahon to attempt a Bonapartist *coup d'état*, but the marshal's refusal and the death of the prince imperial foiled his hopes. He now played but a secondary role in the chamber, and occupied himself mostly with the direction of the journal *L'Autorité*, which he had founded. He was not re-elected in 1902, and died in November 1904. His sons took over *L'Autorité* and the belligerent traditions of the family.

CASSANA, NICCOLÒ (1659-1714), often called Nicoletto, Italian painter, was born at Venice, and became a disciple of his father, Giovanni Francesco Cassana, a Genoese, who had been taught the art of painting by Bernardino Strozzi ("il Prete Genovese"). Having painted portraits of the Florentine court, and also of some of the English nobility, Nicoletto was invited to England, and introduced to Queen Anne, who sat to him for her likeness, and conferred on him many marks of favour. He died in London in 1714, having given way to drinking in his later years. Cassana was a man of the most vehement temper, and would wallow on the ground if provoked with his work. One of his principal paintings is the "Conspiracy of Catiline," now in Florence.

CASSANDER (c. 350-297 b.c.), king of Macedonia, eldest son of Antipater, first appears at the court of Alexander at Babylon, where he defended his father against the accusations of his enemies. Having been passed over by his father in favour of Polyperchon as his successor in the regency of Macedonia, Cassander allied himself with Ptolemy Soter and Antigonus, and declared war against the regent. Most of the Greek states went over to him, and Athens also surrendered. He further effected an alliance with Eurydice, the ambitious wife of King Philip Arrhidaeus of Macedon. Both she and her husband, however, together with Cassander's brother, Nicanor, were soon after slain by Olympias. Cassander at once marched against Olympias, and, having forced her to surrender in Pydna, put her to death (316). In 310 or 309 he also murdered Roxana and Alexander, the wife and son of Alexander the Great, whose natural son Heracles he bribed Polyperchon to poison. He had already connected himself with the royal family by marriage with Thessalonica, Alexander the Great's half-sister, and, having formed an alliance with Seleucus, Ptolemy and Lysimachus, against Antigonus, he became, on the defeat and death of Antigonus in 301, undisputed sovereign of Macedonia. He died of dropsy in 297. Cassander was a man of literary taste, but violent and ambitious. He restored Thebes after its destruction by Alexander the Great, transformed Therma into Thessalonica, and built the new city of Cassandreia upon the ruins of Potidaea.

See Diod. Sic. xviii., xix., xx.; Plutarch, *Demetrius*, 18. 31, *Phocion*, 31; also Macedonian Empire.

CASSANDER (or Cassant), **GEORGE** (1513-1566), Flemish theologian, born at Pitthem

near Bruges, went at an early age to Louvain and was teaching theology and literature in 1541 at Bruges and shortly afterwards at Ghent. About 1549 he removed to Cologne, where, after a profound study of the points of difference between the Catholic and reformed churches, he devoted himself to the project of reunion, thus anticipating the efforts of Leibnitz. In 1561 he published anonymously *De Officiis pii ac publicae tranquillitatis vere amantis viri in hoc dissidio religionis* (Basel), in which, while holding that no one, on account of abuses, has a right utterly to subvert the Church, he does not disguise his dislike of those who exaggerated the papal claims. He takes his standpoint on Scripture explained by tradition and the fathers of the first six centuries. At a time when controversy drowned the voice of reason, such a book pleased neither party; but as some of the German princes thought that he could heal the breach, the emperor Ferdinand asked him to publish his *Consultatio de Articulis Fidei inter Catholicos et Protestantes Controversis* (1565), in which, like Newman at a later date, he tried to put a Catholic interpretation upon Protestant formularies. While never attacking dogma, and even favouring the Roman church on the ground of authority, he criticizes the papal power and makes reflections on practices. The work, attacked violently by the Louvain theologians on one side, and by Calvin and Beza on the other, was put on the Roman Index in 1617. He died at Cologne on the 3rd of February 1566. The collected edition of his works was published in 1616 at Paris.

(E. Tn.)

CASSANDRA, in Greek legend, daughter of Priam and Hecuba. She was beloved of Apollo, who promised to bestow on her the spirit of prophecy if she would comply with his desires. Cassandra accepted the proposal; but no sooner had she obtained the gift than she laughed at the tempter, and refused to her promise. Apollo revenged himself by ordaining that her predictions should be discredited (Apollodorus iii. 12. 5); and hence it was in vain that on the arrival of Helen she prophesied the ruin of Troy. On the capture of that city she was ravished by Ajax, the son of Oïleus, in the temple of Minerva (Strabo vi. p. 264). In the distribution of the booty, Cassandra fell to the lot of Agamemnon; but again her foresight was useless, for he would not believe her prediction that he should perish in his own country. The prophecy was fulfilled, for both were slain through the intrigues of Clytaemnestra (*Odyssey*, xi. 421 ff.). It is to be noticed that there is no mention in Homer of her prophetic gifts. Together with Apollo, she was worshipped under the name of Alexandra.

CASSANO ALL' IONIO, a town of Calabria, Italy, in the province of Cosenza; its railway station (6 m. S. of the town) is 37 m. N. by E. from the town of Cosenza, while it is 6 m. W. of Sibari, on the line between Metaponto and Reggio. Pop. 6842. It is very finely situated, 820 ft. above sea-level: the rock above it is crowned by a medieval castle commanding beautiful views: a tower is still pointed out as that from which the stone was thrown which killed Milo, but this rests on an erroneous identification of Cassano with the ancient Compsa (*q.v.*). There are warm sulphurous springs here which are used for baths.

CASSAVA, the name given to the farinaceous root of two species of Euphorbiaceous plants, the bitter cassava, *Manihot utilissima*, and the sweet cassava, *M. Aipi*, both highly important sources of food starches; Manihot is given as the native Brazilian name in Spanish writings of the 16th century. They are herbaceous or semi-shrubby perennials with very large fleshy, cylindrical, tapering roots as much as 3 ft. long and 6 to 9 in. in diameter, and filled with milky juice. The slender stems, 5 to 9 ft. high, bear large spreading long-stalked leaves, with the blade divided nearly to the base into three to seven long narrow segments. The plants are probably natives of South America, but the bitter cassava, which is the more important of the two in an economic sense, has been introduced into most tropical regions,

and is extensively cultivated in west tropical Africa and the Malay Archipelago, from which, as well as from Brazil and other South American states, its starch in the form of tapioca is a staple article of export. The sap of the bitter cassava root contains hydrocyanic acid, and the root, being therefore highly poisonous, cannot be eaten in a fresh condition; while on the other hand the sweet cassava is perfectly innocuous, and is employed as a table vegetable. Exposure to heat dissipates the poisonous principle, and the concentrated juice is in that state used as the basis of cassareep and other sauces. From the bitter cassava roots many different food preparations are made in Brazil. The roots are preserved for use by being simply cleaned, sliced and dried; from such dried slices manioc or cassava meal, used for cassava cakes, &c., is prepared by rasping. The starch also is separated and used for food under the name of Brazilian arrowroot; and this, when agglomerated into pellets on hot plates, forms the tapioca (*q.v.*) of commerce. Cassava starch has a stellate hilum, which readily distinguishes it under the microscope from other starches.

Cassava or Manioc (*Manihot utilissima*), less than half nat. size.

1, An inflorescence showing at *a* a fruit which will presently separate into five one-seeded parts, about ½ nat. size.
2, Pistil of female flower.
3, Stamens and fleshy disc of male flower.
4, Seed with its appendage (strophiole or caruncle).

CASSEL, a town of northern France in the department of Nord, 34 m. N.W. of Lille by rail. Pop. (1906) 1844. It stands on an isolated hill (515 ft.) from which portions of France, Belgium and England can be seen, with 32 towns and 100 villages, including St Omer, Dunkirk, Ypres and Ostend. The former hôtel de ville (1634), the hôtel de la Noble Cour, once the seat of the jurisdiction of maritime Flanders, now the town-hall, and the hôtel des ducs d'Halluin are the historic buildings of the town. Cassel has a communal college. Its industrial establishments include tanneries, oil-mills, salt refineries and breweries, and there is trade in cattle and butter.

The town, supposed to occupy the site of *Castellum Menapiorum*, was a Roman station, as numerous remains of the Gallo-Roman period attest, and an important centre of roads. It is frequently mentioned in the wars of the middle ages, and was the scene of important battles

in 1071, when Robert, count of Flanders, vanquished his rival Arnulf; 1328, when Philip of Valois defeated the Flemish; and 1677, when William of Orange was defeated by Philip, duke of Orleans, brother of Louis XIV. General D.R. Vandamme (1770-1830) was born in the town.

CASSEL, or KASSEL, a city of Germany, capital of the former electorate of Hesse-Cassel, and, since its annexation by Prussia in 1866, capital of the province of Hesse-Nassau. Pop. (1885) 64,083; (1905) 120,446. It is pleasantly situated, in a hilly and well-wooded country, on both sides of the river Fulda, over which a stone bridge leads to the lower new town, 124 m. by rail N.N.E. from Frankfort-On-Main. The river is navigable for barges, and railways connect the town with all parts of Germany. The streets of the old town are narrow and crooked, and contain many picturesque gabled houses, generally of the 17th century, but those of the upper and lower new town, and the three suburbs, are not surpassed by any in Germany. The principal streets are the Königs-strasse (5100 ft. long and 60 broad), the Schöne Aussicht, and the Stände-platz (180 ft. broad with four rows of linden trees). The large Friedrichs-platz is 1000 by 450 ft. in area. In it stands a marble statue of the landgrave Frederick II. There is a fine view from the open side. The former residence of the electors (*Residenzschloss*) fronts this square, as well as the Museum Fridericianum, with a *façade* of Roman-Ionic columns. The museum contains various valuable collections of curiosities, interesting mosaics, coins, casts, a library of 230,000 volumes, and valuable manuscripts. In the cabinet of curiosities there is a complete collection of clocks and watches from the earliest to the present time. Among these is the so-called Egg of Nuremberg, a watch made about 1500 by Peter Henlein. Among other public places and buildings worthy of notice are the Roman Catholic church, with a splendid interior; the Königs-platz, with a remarkable echo; the Karls-platz, with the statue of the landgrave Charles; and the Martins-platz, with a large church—St Martin's—with twin towers, containing the burial-vaults of the Hessian princes. The gallery of paintings, housed in a handsome building erected in 1880 on the Schöne Aussicht, contains one of the finest small collections in Europe, especially rich in the works of Rembrandt, Frans Hals and Van Dyck.

The town contains numerous educational institutions, including a technical college, a school of painting, a celebrated classical school, which the emperor William II. attended, and a military academy. The descendants of the French refugees who founded the upper new town have a church and hospital of their own. There are three Roman Catholic churches, an English church, and two synagogues. Music is much cultivated, and there is an opera with a first-rate orchestra, of which Ludwig Spohr was at one time conductor. The opera-house or theatre was built by Jerome Napoleon, but in 1906 money was voted for a new building on 458
the Auetor. A new Rathaus (town-hall) has been erected. There are also the Bose Museum, containing collections of pictures and antiquities of Hessian origin, museums of natural history and ethnography, an industrial exhibition hall, and an industrial art school. A handsome Gothic Lutheran church was erected in 1892-1897, a post office (Renaissance) in 1881, and new administrative offices and law courts in 1876-1880. The municipal (or Murhard) library, in the Hanau park, contains 118,000 volumes. The most noticeable of the modern public monuments are those to the emperor William I. (1898), to the musician Spohr (1883), and the Löwenbrunnen (1881). In the Karlsaue, a favourite public promenade lying just below the Schöne Aussicht, are the Orangerie and the marble baths. Cassel is the headquarters of the XI. German army corps, and has a large garrison. It is a favourite residence for foreigners and retired officers and government officials. The industries embrace engine-building, the manufacture of railway carriages and plant, scientific instruments, porcelain, tobacco and cigars, lithography, jute-spinning, iron-founding, brewing and gardening.

On a slope of the Habichtswald Mountains, 3 m. W. of Cassel, and approached by an avenue, is the summer palace of Wilhelmshöhe, erected in 1787-1794. Napoleon III. resided here, as a prisoner of war, after the battle of Sedan. The surrounding gardens are adorned with fountains, cascades, lakes and grottos, the principal fountain sending up a jet of water 180 ft. high and 12 in. in diameter. Here also is an interesting building called the Löwenburg, erected in 1793-1796 in the style of a fortified castle, and containing among other things portraits of Tudors and Stuarts. The principal curiosity is the Karlsburg cascade, which is placed in a broad ravine, thickly wooded on both sides. A staircase of 900 steps leads to the top. On one of the landings is a huge rudely-carved stone figure of the giant Enceladus, and at the top is an octagon building called the Riesenschloss, surmounted by a colossal copper

figure of the Farnese Hercules, 31 ft. high, whose club alone is sufficiently capacious to accommodate from eight to ten persons. In different parts of the park, and especially from the Octagon, charming views are obtained. The park was first formed by the landgrave Frederick II., the husband of Mary, daughter of George II. of England, and was finished by his successor the landgrave William, after whom it was named.

The earliest mention of Cassel is in 913, when it is referred to as Cassala. The town passed from the landgraves of Thuringia to the landgraves of Hesse in the 13th century, becoming one of the principal residences of the latter house in the 15th century. The burghers accepted the reformed doctrines in 1527. The fortifications of the town were restored by the landgrave Philip the Magnanimous and his son William IV. during the 16th century, and it was greatly improved by the landgrave Charles (1654-1730), who welcomed many Huguenots who founded the upper new town. In 1762 Cassel was captured by the Germans from the French; after this the fortifications were dismantled and New Cassel was laid out by the landgrave Frederick II. In 1807 it became the capital of the kingdom of Westphalia; in 1813 it was bombarded and captured by the Russian general Chernichev; in 1830, 1831 and 1848 it was the scene of violent commotions; from 1850 to 1851 it was occupied by the Prussians, the Bavarians and the Austrians; in 1866 it was occupied by the Prussians, and in 1867 was made the capital of the newly formed Prussian province of Hesse-Nassau.

See Piderit, *Geschichte der Haupt- und Residenzstadt Kassel* (Kassel, 1882); Fr. Müller, *Kassel seit 70 Jahren* (2 vols., 2nd ed., Kassel, 1893); and Hessler, *Die Residenzstadt Kassel und ihre Umgebung* (Kassel, 1902).

CASSELL, JOHN (1817-1865), British publisher, was born in Manchester on the 23rd of January 1817. His father was the landlord of a public-house, and John was apprenticed to a joiner. He was self-educated, gaining by his own efforts a considerable acquaintance with English literature and a knowledge of French. He came to London in 1836 to work at his trade, but his energies at this time were chiefly centred in the cause of temperance, for which he was an active worker. In 1847 he established himself as a tea and coffee merchant, and soon after started a publishing business with the aim of supplying good literature to the working classes. From the offices of the firm, which became in 1859 Messrs. Cassell, Petter, Galpin & Co., were issued the *Popular Educator* (1852-1855), the *Technical Educator* (1870-1872), the *Magazine of Art* (1878-1903), *Cassell's Magazine* (from 1852), and numerous editions of standard works. A special feature of Cassell's popular books was the illustration. At the time of the Crimean War he procured from Paris the cuts used in *L'Illustration*, and by printing them in his *Family Paper* (begun in 1853) secured a large circulation for it. The firm was converted in 1883 into a limited liability company, under the name of Cassell & Company, Limited. John Cassell died in London on the 2nd of April 1865.

CASSIA (Lat. *cassia*, Gr. κασία), the aromatic bark derived from *Cinnamomum cassia*. The greater part of the supply coming from China, it is sometimes termed Chinese cinnamon. The bark is much thicker than that of true cinnamon; the taste is more pungent and the flavour less delicate, though somewhat similar to that of cinnamon. The properties of cassia bark depend on the presence of a volatile oil—the oil of cassia, which is imported in a fairly pure state as an article of commerce from Canton. Cassia bark is in much more extensive demand on the continent of Europe than in Great Britain, being preferred to cinnamon by southern nations. The chief use of both the oil and bark is for flavouring liqueurs and chocolate, and in cooking generally. When ground as a spice it is difficult to distinguish cassia from cinnamon (*q.v.*), and it is a common practice to substitute the cheap common spice for the more valuable article. *Cassia Buds*, which have a pleasing cinnamon flavour, are believed to be the immature fruits of the tree which yields Chinese cinnamon. They are brought in considerable quantities from Canton, and used as a spice and in confectionery. *Cassia pulp*, used as a laxative, is obtained from the pods of *Cassia fistula*, or pudding pipe tree, a native of Africa which is cultivated in both the East and West Indies. Some confusion occasionally arises from the fact that *Cassia* is the generic name of an extensive genus of leguminous plants, which, in

addition to various other medicinal products, is the source of the senna leaves which form an important article of materia medica.

CASSIA, VIA, an ancient high-road of Italy, leading from Rome through Etruria to Florentia (Florence); at the 11th mile the Via Clodia (see Clodia, Via) diverged north-north-west, while the Via Cassia ran to the east of the Lacus Sabatinus and then through the place now called Sette Vene, where a road, probably the Via Annia, branched off to Falerii, through Sutrium (where the Via Ciminia, running along the east edge of the Lacus Ciminius, diverged from it, to rejoin it at Aquae Passeris, north of the modern Viterbo[1]), Forum Cassii, Volsinii, Clusium and Arretium, its line being closely followed by the modern highroad from Rome to Florence. The date of its construction is uncertain: it cannot have been earlier than 187 B.C.,[2] when the consul C. Flaminius constructed a road from Bononia to Arretium (which must have coincided with the portion of the later Via Cassia). It is not, it is true, mentioned by any ancient authorities before the time of Cicero, who in 45 B.C. speaks of the existence of three roads from Rome to Mutina, the Flaminia, the Aurelia and the Cassia. A milestone of A.D. 124 mentions repairs to the road made by Hadrian from the boundary of the territory of Clusium to Florence, a distance of 86 m.

See Ch. Hülsen in Pauly-Wissowa, *Realencyclopadie*, iii. 1669.

(T. As.)

1 The Via Traiana Nova, or the (*viae*) tres Traianae, mentioned in inscriptions with the Cassia and Clodia as under the same *curator*, are not certainly identifiable.

2 Having regard to the military importance of Arretium during the Punic wars, it is difficult to believe that no direct road existed to this point before 187 B.C.

CASSIANUS, JOANNES EREMITA, or Joannes Massiliensis (?360-?435), a celebrated recluse, one of the first founders of monastic institutions in western Europe, was probably born in Provence about 360, but he spent the early part of his life in the monastery of 459
Bethlehem with his friend Germanus, and his affinities were always Eastern rather than Western. In company with Germanus he visited Egypt, and dwelt for several years among the ascetics of the desert near the banks of the Nile. In 403 he repaired to Constantinople, where he received ordination as deacon at the hands of Chrysostom. At Marseilles (after 410) he founded two religious societies—a convent for nuns, and the abbey of St Victor, which during his time is said to have contained 5000 inmates. In later times his regulations enjoyed a high reputation, and were adopted by the monks and nuns of Port Royal. He was eventually canonized; and a festival in his honour long continued to be celebrated at Marseilles on the 25th of July. Cassianus was one of the first and most prominent of the Semi-Pelagians, maintaining that while man is by nature sinful, he yet has some good remaining in him, and that, while the immediate gift of God's grace is necessary to salvation, conversion may also be begun by the exercise of man's will. He further asserted that God is always willing to bestow his grace on all who seek it, though, at the same time, it is true that he sometimes bestows it without its being sought. These views have been held by a very large part of the church from his time, and embrace much of the essence of Arminianism. The style of Cassianus is slovenly, and shows no literary polish, but its direct simplicity is far superior to the rhetorical affectations which disfigure most of the writings of that age. At the request of Castor, bishop of Apt, he wrote two monumental and influential treatises on the monastic life. The *De Institutione Coenobiorum* (twelve books) describes the dress, the food, the devotional exercises, the discipline and the special spiritual dangers of monastic life in the East (gluttony, unchastity, avarice, anger, gloom, apathy, vanity and pride). The *Collationes Patrum*, a series of dialogues with the pious fathers of Egypt, deal with the way in which these dangers (and others, *e.g.* demons) may be avoided or overcome. At the desire of Leo (then archdeacon of Rome) he wrote against Nestorius his *De Incarnatione Domini* in seven books.

Editions.—Douay (1616) by Alardus Gazäus, with excellent notes; Migne's *Patrol. Lat.* vols.

xlix. and l.; M. Petschenig in the Vienna *Corpus Script. Eccles. Lat.* (2 vols., 1886-1888). See A. Harnack, *History of Dogma*, v. 246 ff., 253 ff.; A. Hoch, *Die Lehre d. Joh. Cassian von Natur und Gnade* (Freiburg, 1895); W. Moeller, *History of the Chr. Church*, i. 368-370.

CASSINI, the name of an Italian family of astronomers, four generations of whom succeeded each other in official charge of the observatory at Paris.

Giovanni Domenico Cassini (1625-1712), the first of these, was born at Perinaldo near Nice on the 8th of June 1625. Educated by the Jesuits at Genoa, he was nominated in 1650 professor of astronomy in the university of Bologna; he observed and wrote a treatise on the comet of 1652; was employed by the senate of Bologna as hydraulic engineer; and appointed by Pope Alexander VII. inspector of fortifications in 1657, and subsequently director of waterways in the papal states. His determinations of the rotation-periods of Jupiter, Mars and Venus in 1665-1667 enhanced his fame; and Louis XIV. applied for his services in 1669 at the stately observatory then in course of erection at Paris. The pope (Clement IX.) reluctantly assented, on the understanding that the appointment was to be temporary; but it proved to be irrevocable. Cassini was naturalized as a French subject in 1673, having begun work at the observatory in September 1671. Between 1671 and 1684 he discovered four Saturnian satellites, and in 1675 the division in Saturn's ring (see Saturn); made the earliest sustained observations of the zodiacal light, and published, in *Les Éléments de l'astronomie vérifiés* (1684), an account of Jean Richer's (1630-1696) geodetical operations in Cayenne. Certain oval curves which he proposed to substitute for Kepler's ellipses as the paths of the planets were named after him "Cassinians." He died at the Paris observatory on the 11th of September 1712.

A partial autobiography left by Giovanni Domenico Cassini was published by his great-grandson, Count Cassini, in his *Mémoires pour servir à l'histoire des sciences* (1810). See also C. Wolf, *Histoire de l'observatoire de Paris* (1902); Max. Marie, *Histoire des sciences*, t. iv. p. 234; R. Wolf, *Geschichte der Astronomie*, p. 450, &c.

Jacques Cassini (1677-1756), son of Domenico Cassini, was born at the Paris observatory on the 8th of February 1677. Admitted at the age of seventeen to membership of the French Academy of Sciences, he was elected in 1696 a fellow of the Royal Society of London, and became *maitre des comptes* in 1706. Having succeeded to his father's position at the observatory in 1712, he measured in 1713 the arc of the meridian from Dunkirk to Perpignan, and published the results in a volume entitled *De la grandeur et de la figure de la terre* (1720) (see Geodesy). He wrote besides *Élémens d'astronomie* (1740), and died on the 18th of April 1756 at Thury, near Clermont. The first tables of the satellites of Saturn were supplied by him in 1716.

See C. Wolf, *Histoire de l'observatoire de Paris*; Max. Marie, *Histoire des sciences*, vii. 214; R. Wolf, *Geschichte der Astronomie*, p. 451; J.C. Houzeau, *Bibl. astronomique*; J. Delambre, *Histoire de l'astronomie au XVIII'e siècle*, pp. 250-275 (unfairly depreciatory); J.F. Montucla, *Hist. des mathématiques*, iv. 145, 248.

César François Cassini, or Cassini de Thury (1714-1784), son of Jacques Cassini, was born at the observatory of Paris on the 17th of June 1714. He succeeded to his father's official employments, continued the hereditary surveying operations, and began in 1744 the construction of a great topographical map of France. The post of director of the Paris observatory was created for his benefit in 1771, when the establishment ceased to be a dependency of the Academy of Sciences. Cassini de Thury died at Thury on the 4th of September 1784. His chief works are:—*Méridienne de l'observatoire de Paris* (1744), *Description géométrique de la terre* (1775), and *Description géométrique de la France* (1784).

See C. Wolf, *Histoire de l'observatoire de Paris*, p. 287; Max. Marie, *Histoire des sciences*, viii. 158; J. Delambre, *Histoire de I'astronomie au XVIII'e siècle*, pp. 275-309; R. Wolf, *Geschichte der Astronomie*, p. 451; J.J. de Lalande, *Bibliographic astronomique*.

Jacques Dominique Cassini, Count (1748-1845), son of César François Cassini, was born at the observatory of Paris on the 30th of June 1748. He succeeded in 1784 to the directorate of the observatory; but his plans for its restoration and re-equipment were wrecked in 1793 by the animosity of the National Assembly. His position having become intolerable, he resigned on the 6th of September, and was thrown into prison in 1794, but released after seven

months. He then withdrew to Thury, where he died, aged ninety-seven, on the 18th of October 1845. He published in 1770 an account of a voyage to America in 1768, undertaken as the commissary of the Academy of Sciences with a view to testing Pierre Leroy's watches at sea. A memoir in which he described the operations superintended by him in 1787 for connecting the observatories of Paris and Greenwich by longitude-determinations appeared in 1791. He visited England for the purposes of the work, and saw William Herschel at Slough. He completed his father's map of France, which was published by the Academy of Sciences in 1793. It served as the basis for the *Atlas National* (1791), showing France in departments. Count Cassini's *Mémoires pour servir à l'histoire de l'observatoire de Paris* (1810) embodied portions of an extensive work, the prospectus of which he had submitted to the Academy of Sciences in 1774. The volume included his *Éloges* of several academicians, and the autobiography of his great-grandfather, the first Cassini.

See J.F.S. Devic, *Histoire de la vie et des travaux de J.D. Cassini* (1851); J. Delambre, *Histoire de l'astronomie au XVIII'e siècle*, pp. 309-313; *Phil. Mag.* 3rd series, vol. xxviii. p. 412; C. Wolf, *Histoire de l'observatoire de Paris* (1902), p. 234 et passim.

(A. M. C.)

CASSIODORUS (not *Cassiodorius*), the name of a Syrian family settled at Scyllacium (Squillace) in Bruttii, where it held an influential position in the 5th century A.D. Its most important member was Flavius Magnus Aurelius Cassiodorus Senator (c. 490-585), historian, statesman, and monk. "Senator" (not a title) is the name used by himself in his official correspondence. His father held the offices of *comes privatarum* and *sacrarum largitionum* (controller of the emperor's private revenue and the public exchequer) under Odoacer, and subsequently attached himself to Theodoric, by whom he was appointed *corrector* (governor) of Bruttii and Lucania, and *praefectus praetorio*. The son at an early age became *consiliarius* (legal assessor) to his father, and (probably in 507) *quaestor*, an official whose chief duty at that time consisted in acting as the mouthpiece of the ruler, and drafting his despatches. In 514 he was ordinary consul, and at a later date possibly *corrector* of his native province. At the death of Theodoric (526) he held the office of *magister officiorum* (chief of the civil service). Under Athalaric he was *praefectus praetorio*, a post which he retained till about 540, after the triumphal entry of Belisarius into Ravenna, when he retired from public life. With the object of providing for the transmission of divine and human knowledge to later ages, and of securing it against the tide of barbarism which threatened to sweep it away, he founded two monasteries—Vivarium and Castellum—in his ancestral domains at Squillace (others identify the two monasteries). The special duty which he enjoined upon the inmates was the acquisition of knowledge, both sacred and profane, the latter, however, being subordinated to the former. He also collected and emended valuable MSS., which his monks were instructed to copy, and superintended the translation of various Greek works into Latin. He further amused himself with making scientific toys, such as sun-dials and water-clocks. As he is stated to have written one of his treatises at the age of ninety-three, he must have lived till after 580. Whether he belonged to the Benedictine order is uncertain.

The writings of Cassiodorus evince great erudition, ingenuity and labour, but are disfigured by incorrectness and an affected artificiality, and his Latin partakes much of the corruptions of the age. His works are (1) historical and political, (2) theological and grammatical.

1. (a) *Variae*, the most important of all his writings, in twelve books, published in 537. They contain the decrees of Theodoric and his successors Amalasuntha, Theodahad and Witigis; the regulations of the chief offices of state; the edicts published by Cassiodorus himself when *praefectus praetorio*. It is the best source of our knowledge of the Ostrogothic kingdom in Italy (ed. T. Mommsen in *Monumenta Germaniae Historica: Auctores Antiquissimi*, xii., 1894; condensed English translation by T. Hodgkin, 1886).

(b) *Chronica*, written at the request of Theodoric's son-in-law Eutharic, during whose consulship (519) it was published. It is a dry and inaccurate compilation from various sources, unduly partial to the Goths (ed. T. Mommsen in *Mon. Germ. Hist.: Auct. Ant.* xi. pt. i., 1893).

(c) Panegyrics on Gothic kings and queens (fragments ed. L. Traube in *Mon. Germ. Hist.: Auct. Ant.* xii.).

2. (a) *De Anima*, a discussion on the nature of the soul, at the conclusion of which the author deplores the quarrel between two such great peoples as the Goths and Romans. It

seems to have been published with the last part of the *Variae*.

(b) *Institutiones divinarun et humanarunt litterarum*, an encyclopaedia of sacred and profane literature for the monks, and a sketch of the seven liberal arts. It further contains instructions for using the library, and precepts for daily life.

(c) A commentary on the Psalms and short notes (*complexiones*) on the Pauline epistles, the Acts, and the Apocalypse.

(d) *De Orthographia*, a compilation made by the author in his ninety-third year from the works of twelve grammarians, ending with his contemporary Priscian (ed. H. Keil, *Grammatici Latini*, vii.).

The Latin translations of the *Antiquities* of Josephus and of the ecclesiastical histories of Theodoret, Sozomen and Socrates, under the title of *Historia Tripartita* (embracing the years 306-439), were carried out under his supervision.

Of his lost works the most important was the *Historia Gothorum*, written with the object of glorifying the Gothic royal house and proving that the Goths and Romans had long been connected by ties of friendship. It was published during the reign of Athalaric, and appears to have brought the history down to the death of Theodoric. His chief authority for Gothic history and legend was Ablavius (Ablabius). The work is only known to us in the meagre abridgment of Jordanes (ed. T. Mommsen, 1882).

COMPLETE WORKS.—*Editio princeps*, by G. Fornerius (Paris, 1579); J. Garet (Rouen, 1679; Venice, 1729), reprinted in J.P. Migne, *Patrologia Latina*, lxix., lxx. On Cassiodorus generally, see *Anecdoton Holderi*, excerpts from a treatise of Cassiodorus, edited by H. Usener (Bonn, 1877), which throws light on questions connected with his biography; T. Mommsen, preface to his edition of the *Variae*; monographs by A. Thorbecke (Heidelberg, 1867) and A. Franz (Breslau, 1872); T. Hodgkin, *Italy and her Invaders*, iii. p. 280, iv. p. 348; A. Ebert, *Allgemeine Geschichte der Litteratur des Mittelalters* i.; Teuffel-Schwabe, *Hist. of Roman Literature* (Eng trans.), § 483; G.A. Simcox, *Hist. of Latin Literature* (1884); W. Ramsay in Smith's *Dictionary of Greek and Roman Biography* J.B. Bury's edition of Gibbon's *Decline and Fall*, iv. 180, 522; R.W. Church in the *Church Quarterly Review*, x. (1880); J.E. Sandys in *Hist. of Classical Scholarship* (2nd ed., 1906); A. Olleris, *Cassiodore, conservateur des livres de l'antiquité latine* (Paris, 1891); G. Minasi, *M.A. Cassiodoro ... ricerche storico-critiche* (Naples, 1895); and C. Cipolla in *Memorie della r. Accademia delle scienze di Torino* (2nd ser. xliii. pt. 2, 1893); L.M. Hartmann in Pauly-Wissowa's *Realencyclopadie*, iii. pt. 2 (1899), with note on the musical section of Cassiodorus' *Institutions* by C. von Jan.

CASSIOPEIA, in Greek mythology, the wife of Cepheus, and mother of Andromeda; in astronomy, a constellation of the northern hemisphere, mentioned by Eudoxus (4th century B.C.) and Aratus (3rd century B.C.). Ptolemy catalogued 13 stars in this constellation, Tycho Brahe 46, and Hevelius 37. Its most interesting stars are:—*Nova Cassiopeiae*, a "new" star, which burst out with extraordinary brilliancy in 1572, when it was observed by Tycho Brahe, but gradually diminished in brightness, ultimately vanishing in about eighteen months; *α-Cassiopeiae* and *R-Cassiopeiae* are variable stars, the former irregular, the latter having a long period; *η-Cassiopeiae*, a binary star, having components of magnitudes 3½ and 7½; *σ-Cassiopeiae*, a double star, one being white and of magnitude 5, the other blue and of magnitude 7½.

CASSITERIDES (from the Gr. κασσίτερος, tin, *i.e.* "Tin-islands"), in ancient geography the name of islands regarded as being situated somewhere near the west coasts of Europe. Herodotus (430 B.C.) had dimly heard of them. Later writers, Posidonius, Diodorus, Strabo and others, call them smallish islands off (Strabo says, some way off) the north-west coast of Spain, which contained tin mines, or, as Strabo says, tin and lead mines—though a passage in Diodorus derives the name rather from their nearness to the tin districts of north-west Spain. While geographical knowledge of the west was still scanty and the secrets of the tin-trade were still successfully guarded by the seamen of Gades and others who dealt in the metal,

the Greeks knew only that tin came to them by sea from the far west, and the idea of tin-producing islands easily arose. Later, when the west was better explored, it was found that tin actually came from two regions, north-west Spain and Cornwall. Neither of these could be called “small islands” or described as off the north-west coast of Spain, and so the Cassiterides were not identified with either by the Greek and Roman geographers. Instead, they became a third, ill-understood source of tin, conceived of as distinct from Spain or Britain. Modern writers have perpetuated the error that the Cassiterides were definite spots, and have made many attempts to identify them. Small islands off the coast of north-west Spain, the headlands of that same coast, the Scillies, Cornwall, the British Isles as a whole, have all in turn been suggested. But none suits the conditions. Neither the Spanish islands nor the Scillies contain tin, at least in serious quantities. Neither Britain nor Spain can be called “small islands off the north-west of Spain.” It seems most probable, therefore, that the name Cassiterides represents the first vague knowledge of the Greeks that tin was found overseas somewhere in or off western Europe.

AUTHORITIES.—Herodotus iii. 115; Diodorus v. 21, 22, 38; Strabo ii. 5, iii. 2, 5, v. 11; Pliny, *Nat. Hist*, iv. 119, vii. 197, xxxiv. 156-158, are the chief references in ancient literature. T.R. Holmes, *Ancient Britain* (1907), appendix, identifies the Cassiterides with the British Isles.

(F. J. H.)

CASSITERITE (from the Gr. κασσίτερος, tin), the mineralogical name for tin-stone, the common ore of tin. It consists of tin dioxide, or stannic oxide (SnO_2), and crystallizes in the tetragonal system. The crystals are usually 4-sided or 8-sided prisms, striated vertically, and terminated by pyramids (fig. 1). Twins, with characteristic re-entrant angles, such as figs. 2 and 3, are common. Certain slender prismatic crystals, with an acute 8-sided pyramid, are known in Cornwall as “sparable tin,” in allusion to their resemblance to sparable nails, whilst very slender crystals are termed needle-tin. Occasionally the mineral occurs in fibrous forms, which pass under the name of “wood-tin,” and these, though not unknown in the matrix, are generally found as rolled pebbles. By the disintegration of tin-bearing rocks and vein-stones, the cassiterite passes into the beds of streams as rolled fragments and grains, or even sand, and is then known as stream tin or alluvial tin. This detrital tin-ore was probably used as a source of the metal before the primitive miners had learnt to attack the solid tin-bearing rocks.

Pure cassiterite may be colourless, or white, as seen in certain specimens from the Malay Peninsula; but usually the mineral is brown or even black, the colour being referred to the presence of ferric oxide or other impurity. Occasionally the tin-stone is red. In microscopic sections the colour is often seen to be disposed in zones, following the contour of the crystal. A brown variety, with rather resinous lustre, is termed “rosin tin.” The usual lustre of crystals of cassiterite is remarkably splendent, even adamantine. The mineral has a high refractive index, and strong bi-refringence. Certain transparent yellow and brown specimens, cut as gem-stones, exhibit considerable brilliancy. The hardness of cassiterite is 6.5, so that it cannot be scratched with a knife, and is nearly as hard as quartz. Its specific gravity is about 7; and in consequence of this high density, the tin-stone is readily separated during the process of dressing, from all the associated minerals, except wolframite, which may, however, be removed by magnetic separators.

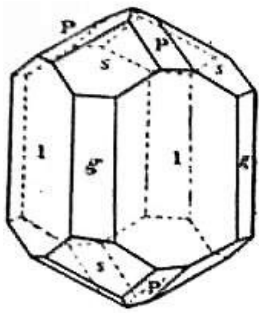
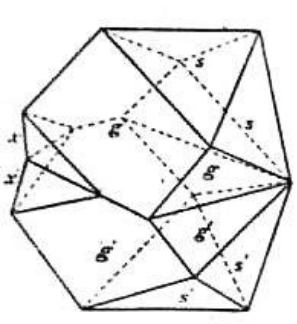


FIG. 1.



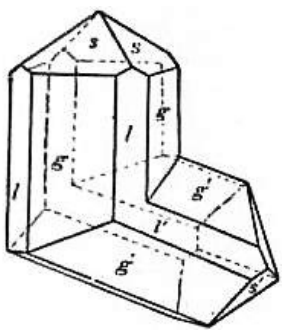


FIG. 2. FIG. 3.

Cassiterite usually occurs as veins or impregnations in granitic rocks, and is especially associated with the quartz-mica rock called greisen. The usual associates of the tin-stone are quartz, tourmaline, apatite, topaz, beryl, fluorite, lithia-mica, wolframite, chalcopyrite, &c. The presence of fluorine in many of these minerals has led to the opinion that the tin has been derived in many cases from an acid or granitic magma by the action of fluorine-bearing vapours, and that cassiterite may have been formed by the interaction of tin fluoride and water vapour. Cassiterite occurs as a pseudomorph after orthoclase felspar in some of the altered granite of Cornwall, and it has occasionally been found as a cementing material in certain brecciated lodes.

Among the localities yielding cassiterite may be mentioned Cornwall, Saxony, Bohemia, Brittany, Galicia in Spain; the Malay peninsula, and the islands of Banca and Billiton; New South Wales, Queensland and Tasmania. Fine examples of wood-tin, occurring with topaz, are found in Durango in Mexico. Deposits of cassiterite under rather exceptional conditions are worked on a large scale in Bolivia; and it is notable that cassiterite is found in Liassic limestone near Campiglia Marittima in Tuscany. Cassiterite has been worked in the York region, Alaska.

(F. W. R.*)

CASSIUS, the name of a distinguished ancient Roman family, originally patrician. Its most important members are the following.

1. SPURIUS CASSIUS, surnamed *Vecellinus* (*Vicellinus, Viscellinus*), Roman soldier and statesman, three times consul, and author of the first agrarian law. In his first consulate (502 B.C.) he defeated the Sabines; in his second (493) he renewed the league with the Latins, and dedicated the temple of Ceres in the Circus; in his third (486) he made a treaty with the conquered Hernici. The account of his agrarian law is confused and contradictory; it is clear, however, that it was intended to benefit the needy plebeians (see AGRARIAN LAWS). As such it was violently opposed both by the patricians and by the wealthy plebeians. Cassius was condemned by the people as aiming at kingly power, and hurled from the Tarpeian rock. Another account says he was tried by the family council and put to death by his own father, who considered his proposal prejudicial to the patrician interest. According to Livy, his proposal to bestow a share of the land upon the Latins was regarded with great suspicion. According to Mommsen (*Römische Forschungen*, ii.), the whole story is an invention of a later age, founded upon the proposals of the Gracchi and M. Livius Drusus, to which period belongs the idea of sharing public land with the Latins.

See Livy ii. 33, 41; Dion Halic. v. 49, viii. 69-80; Cicero, *Pro Balbo*, 23 (53), *De Republica*, ii. 27 (49), 35 (60); Val. Max. v. 8. 2.

The following Cassii are all plebeians. It is suggested that the sons of Spurius Cassius either were expelled from, or voluntarily left, the patrician order, in consequence of their father's execution.

2. GAIUS CASSIUS LONGINUS, consul 73 B.C. With his colleague, Terentius Varro Lucullus, he passed a law (*lex Terentia Cassia*), the object of which was to give authority for the purchase of corn at the public expense, to be retailed at a fixed price at Rome. It is doubtful whether this Cassius (who is often called by the additional name Varus) is identical with the Varus who was proscribed by the triumvirs, and put to death at Minturnae (43). According to Orosius he was killed at the battle of Mutina.

See Cicero, *In Verrem*, iii. 70, 75, v. 21; Livy, *Epit.* 96; Appian, *Bell. Civ.* iv. 28; Orosius v. 24.

3. GAIUS CASSIUS LONGINUS, prime mover in the conspiracy against Julius Caesar. Little is known of his early life. In 53 B.C. he served in the Parthian campaign under M. Licinius Crassus, saved the remnants of the army after the defeat at Carrhae, and for two years successfully repelled the enemy. In 49 B.C. he became tribune of the plebs. The outbreak of the civil war saved him from being brought to trial for extortion in Syria. He at first sided with Pompey, and as commander of part of his fleet rendered considerable service in the Mediterranean. After Pharsalus he became reconciled to Caesar, who made him one of his

legates. In 44 B.C. he became *praetor peregrinus* with the promise of the Syrian province for the ensuing year. The appointment of his junior, M. Junius Brutus, as *praetor urbanus* deeply offended him, and he was one of the busiest conspirators against Caesar, taking an active part in the actual assassination. He then left Italy for Syria, raised a considerable army, and defeated P. Cornelius Dolabella, to whom the province had been assigned by the senate. On the formation of the triumvirate, Brutus and he, with their combined armies, crossed the Hellespont, marched through Thrace, and encamped near Philippi in Macedonia. Their intention was to starve out the enemy, but they were forced into an engagement. Brutus was successful against Octavian, but Cassius, defeated by M. Antonius (Mark Antony), gave up all for lost, and ordered his freedman to slay him. He was lamented by Brutus as “the last of the Romans,” and buried at Thasos. A man of considerable ability, he was a good soldier, and took an interest in literature, but in politics he was actuated by vanity and ambition. His portrait in Shakespeare’s *Julius Caesar*, though vivid, is scarcely historical.

See Plutarch, *Brutus*, passim, *Crassus*, 27, 29, *Caesar*, 62, 69; Dio Cassius xl. 28, xlii. 13, xliv. 14, xlvii. 20; Vell. Pat. ii. 46, 56, 58, 69, 70, 87; Cicero, *Philippics*, xi. 13, 14, *ad Att.* v. 21, xiv. 21, *ad Fam.* xi. 3, 15, 16; Appian, *Bell. Civ.* ii. 111, 113, iii. 2, 8, iv. 60-62, 87, 90, 111-113, 132; Caesar, *Bell. Civ.* iii. 101.

4. Quintus Cassius Longinus, the brother or cousin of the murderer of Caesar, quaestor of Pompey in Further Spain in 54 B.C. In 49, as tribune of the people, he strongly supported the cause of Caesar, by whom he was made governor of Further Spain. He treated the provincials with great cruelty, and his appointment (48) to take the field against Juba, king of Numidia, gave him an excuse for fresh oppression. The result was an unsuccessful insurrection at Corduba. Cassius punished the leaders with merciless severity, and made the lot of the provincials harder than ever. At last some of his troops revolted under the quaestor M. Marcellus, who was proclaimed governor of the province. Cassius was surrounded by Marcellus in Ulia. Bogud, king of Mauretania, and M. Lepidus, proconsul of Hither Spain, to whom Cassius had applied for assistance, negotiated an arrangement with Marcellus whereby Cassius was to be allowed to go free with the legions that remained loyal to him. Cassius sent his troops into winter quarters, hastened on board ship at Malaca with his ill-gotten gains, but was wrecked in a storm at the mouth of the Iberus (Ebro). His tyrannical government of Spain had greatly injured the cause of Caesar.

See Dio Cassius xli. 15, 24, xlii. 15, 16, xliii. 29; Livy, *Epit.* III; Appian, *B.C.* ii. 33, 43; *Bellum Alexandrinum*, 48-64.

5. Gaius Cassius Longinus (1st century A.D.), Roman jurist, consul in 30, proconsul of Asia 40-41, and governor of Syria under Claudius 45-50. On his return to Rome his wealth and high character secured him considerable influence. He was banished by Nero (65) to Sardinia, because among the images of his ancestors he had preserved that of the murderer of Caesar. He was recalled by Vespasian, and died at an advanced age. As he was consul in 30, he must have been born at the latest in the year 3 B.C. Cassius was a pupil of Masurius Sabinus, with whom he founded a legal school, the followers of which were called Cassiani. His chief work was the *Libri Juris Civilis* in ten books, which was used by the compilers of the *Digest* of Justinian.

See Tacitus, *Annals*, xvi. 7-9; Suetonius, *Nero*, 37; Dio Cassius lix. 29; Teuffel-Schwabe, *Hist. of Roman Literature*, § 298, 3.

CASSIUS, AVIDIUS (d. A.D. 175), Roman general, a Syrian by birth, lived during the reign of Marcus Aurelius. He especially distinguished himself during the Parthian War (A.D. 162-165), at the conclusion of which he was apparently appointed military governor of Asia, though the actual extent of his jurisdiction is doubtful. In 172 he was sent to Egypt, where he put down a dangerous rising of the Bucolici, the robber herdsmen of the delta of the Nile, after which he returned to Syria. In 175 the emperor Aurelius fell ill, and his wife Faustina, to secure her position in case of his death, offered her hand and the throne to the successful general. A rumour of Aurelius’s death having reached Syria, Cassius, without waiting for confirmation, proclaimed himself emperor; when the report proved false, it was too late for him to draw back, and he accordingly prepared for war. The senate declared him a public enemy, although Aurelius even then expressed the hope that he might have the opportunity of pardoning him. Deploring the necessity for taking up arms against his trusted officer,

Aurelius set out for the east. While in Illyria, he received the news that Cassius had been slain by his own officers. The murderers offered his head to Aurelius, who refused to admit them, and ordered its immediate burial.

See Dio Cassius lxxi. 2-4, 17, 22-28, 30, 31; Fronto, *Letters*, i. 6; Lives of Marcus Aurelius, Verus and Commodus in the *Scriptores Historiae Augustae*, and the special biography of Avidius Cassius in the same by Vulcacius Gallicanus. The various letters and documents in the last-named are generally considered spurious, and the portions of the narrative founded on them consequently untrustworthy. See also article in Pauly-Wissowa's *Realencyclopädie*, ii. pt. 2 (1896).

CASSIUS, GAIUS, Latin poet, general and politician, called Parmensis from his birthplace Parma, was one of the murderers of Julius Caesar, and after his death joined the party of Brutus and his namesake Cassius the conspirator. In 43 B.C. he was in command of the fleet on the coast of Asia, but after the battle of Philippi joined Sextus Pompeius in Sicily. When Pompeius, having been defeated in a naval engagement at Naulochus by the fleet of Octavian under Agrippa, fled to Asia, Cassius went over to Antony, and took part in the battle of Actium (31). He afterwards fled to Athens, where he was soon put to death by Octavian, whom he had offended by writing an abusive letter (Suetonius, *Augustus*, 4). Cassius is credited with satires, elegies, epigrams and tragedies. Some hexameters with the title *Cassii Orpheus* are by Antonius Thylesius, an Italian of the 17th century. Horace appears to have thought well of Cassius as a poet, for he asks Tibullus whether he intends to compete with the *opuscula* (probably the elegies) of Cassius (*Epistles*, i. 4. 3). The story in the Horace scholia, that L. Varius Rufus published his famous tragedy *Thyestes* from an MS. which he found amongst the papers of Cassius after his death, is due to a confusion of Cassius's murderer, Q. Attius Varus, with the tragedian (Appian, *B.C.* v. 2, 139; Cicero, *ad Fam.* xii. 13; Veil. Pat. ii. 87; Orosius, vi. 19; see also the diffuse treatise of A. Weichert, *De L. Varii et Cassii Parmensis Vita et Carminibus*, 1836). Cassius Parmensis must not be confused with Cassius Etruscus (Horace, *Satires*, i. 10. 60), an improviser, who is said to have used enough paper to furnish his funeral pyre.

CASSIVELAUNUS, or CASSIVELLAUNUS, a British chieftain, ruler of the country north of the Thames, who led the native tribes against Julius Caesar on his second expedition (54 B.C.) (see BRITAIN). After several indecisive engagements, Caesar took the camp of Cassivelaunus, who was obliged to make peace on condition of paying tribute and giving hostages. But these promises were not meant to be kept, and it appears certain that the tribute was never paid. According to Bede (*Hist. Eccles.* i. 2), the remains of Cassivelaunus's entrenchment were visible seven or eight centuries later.

See Caesar, *B.G.* v. 11-22; Dio Cassius xl. 2, 3; Orosius vi. 9. 6; Eutropius vi. 17; Polyaenus, *Strategemata*, viii. 23. For the etymology of the name (which is Celtic in origin, and appears later as Caswallon) see J. Rhys, *Celtic Britain*, pp. 289-290 (1904); C.I. Elton, *Origins of English History* (1890); and Stock's edition of Caesar, *De Bella Gallico*(1898).

CASSOCK (Fr. *casaque*, a military cloak), a long-sleeved, close-fitting robe worn by the clergy and others engaged in ecclesiastical functions. The name was originally specially applied to the dress worn by soldiers and horsemen, and later to the long garment worn in civil life by both men and women. As an ecclesiastical term the word "cassock" came into use somewhat late (as a translation of the old names of *subtanea, vestis talaris, toga talaris*, or *tunica talaris*), being mentioned in canon 74 of 1604; and it is in this sense alone that it now survives. The origin of the word has been the subject of much speculation. It is derived

through the French from the Italian *casacca*, which Florio (*Q. Anna's New World of Words*, 1611) translates as "a frock, a horseman's cote, a long cote; also a habitation or dwelling," and it is usually held that this in turn is derived from *casa*, a house (cf. the derivation of "chasuble," *q.v.*). This, however, though possible is uncertain. A Slav origin for the word has been suggested (Hatzfeld and Darmesteter, *Dic. gén. de la langue française*), and the Cossack horseman may have given to the West both the garment and the name. Or again, it may be derived from *casequin* (Ital. *casecchino*), rather than vice versa, and this in turn from an Arabic *kazáyand* (Pers. *kasháyand*), a padded jerkin; the word *kasagân* occurring in Mid. High Ger. for a riding-cloak, and *gasygan* in O. Fr. for a padded jerkin (Lagarde in *Gott. gelehrte Anzeiger*, April 15, 1887, p. 238).

The cassock, though part of the canonical costume of the clergy, is not a liturgical vestment. It was originally the out-of-doors and domestic dress of lay-people as well as clergy, and its survival among the latter when the secular fashions had changed is merely the outcome of ecclesiastical conservatism. In mild weather it was the outer garment; in cold weather it was worn under the tabard or chimere (*q.v.*) sometimes in the middle ages the name "chimere" was given to it as well as to the sleeveless upper robe. In winter the cassock was often lined with furs varying in costliness with the rank of the wearer, and its colour also varied in the middle ages with his ecclesiastical or academic status. In the Roman Catholic Church the *subtanea* (Fr. *soutane*, Ital. *sottana*) must be worn by the clergy whenever they appear, both in ordinary life (except in Protestant countries) and under their vestments in church. It varies in colour with the wearer's rank: white for the pope, red (or black edged with red) for cardinals, purple for bishops, black for the lesser ranks: members of religious orders, however, whatever their rank, wear the colour of their religious habit. In the Church of England the cassock, which with the gown is prescribed by the above-mentioned canon of 1604 as the canonical dress of the clergy, has been continuously, though not universally, worn by the clergy since the Reformation. It has long ceased, however, to be their every-day walking dress and is now usually only worn in church, at home, or more rarely by clergy within the precincts of their own parishes. The custom of wearing the cassock under the vestments is traceable in England to about the year 1400.

The old form of English cassock was a double-breasted robe fastened at the shoulder and probably girdled. The continental, single-breasted cassock, with a long row of small buttons from neck to hem, is said to have been first introduced into England by Bishop Harris of Llandaff (1729-1738). The shortened form of cassock which survives in the bishop's "apron" was formerly widely used also by the continental clergy. Its use was forbidden in Roman Catholic countries by Pope Pius IX., but it is still worn by Roman Catholic dignitaries as part of their out-of-door dress in certain Protestant countries.

See the *Report* of the sub-committee of Convocation *on the Ornaments of the Church and its Ministers* (London, 1908), and authorities there cited.

CASSONE, in furniture, the Italian name for a marriage coffer. The ancient and once almost universal European custom of providing a bride with a chest or coffer to contain the household linen, which often formed the major part of her dowry, produced in Italy a special type of chest of monumental size and artistic magnificence. The cassoni of the people, although always large in size, were simple as regards ornament; but those of the nobles and the well-to-do mercantile classes were usually imposing as regards size, and adorned with extreme richness. The cassone was almost invariably much longer than the English chest, and even at a relatively early period it assumed an artistic finish such as was never reached by the chests of northern Europe, except in the case of a few of the royal *corbeilles de mariage* made by such artists as Boulle for members of the house of France. Many of the earlier examples were carved in panels of geometrical tracery, but their characteristic ornament was either *intarsia* or *gesso*, or a mixture of the two. Bold and massive feet, usually shaped as claws, lioncels, or other animals are also exceedingly characteristic of cassoni, most of which are of massive and sarcophagus-like proportions with moulded lids, while many of them are adorned at their corners with figures sculptured in high relief. The scroll-work inlay is commonly simple and graceful, consisting of floral or geometrical motives, or arabesques. The examples coated with gilded *gesso* or blazoned with paintings are, however, the most magnificent. They were often made of chestnut, and decorated with flowers and foliage in a relief which, low at first, became after the Renaissance very high and sharp. The

panels of the painted cassoni frequently bore representations of scriptural and mythological subjects, or incidents derived from the legends of chivalry. Nor was heraldry forgotten, the arms of the family for which the chest was made being perhaps emblazoned upon the front. These chests rarely bear dates or initials, but it is often possible to determine their history from their armorial bearings.

CASSOWARY (*Casuarius*), a genus of struthious birds, only inferior in size to the emeu and ostrich, and, according to Sir R. Owen, approximating more closely than any other living birds to the extinct moas of New Zealand. The species are all characterized by short rudimentary wings, bearing four or five barbless shafts, a few inches long, and apparently useless for purposes of flight, of running, or of defence; and by loosely webbed feathers, short on the neck, but of great length on the rump and back, whence they descend over the body forming a thick hair-like covering. They possess stout limbs, with which they kick in front, and have the inner toe armed with a long powerful claw. The common cassowary (*Casuarius galeatus*) stands 5 ft. high, and has a horny, helmet-like protuberance on the crown of its head; the front of the neck is naked and provided with two brightly-coloured wattles. It is a native of the Island of Ceram, where it is said to live in pairs, feeding on fruits and herbs, and occasionally on small animals. The mooruk, or Bennett's cassowary (*Casuarius Bennettii*), is a shorter and more robust bird, approaching in the thickness of its legs to the moas. It differs further from the preceding species in having its head crowned with a horny plate instead of a helmet. It has only been found in New Britain, where the natives are said to regard it with some degree of veneration. When captured by them shortly after being hatched, and reared by the hand, it soon becomes tame and familiar; all the specimens which have reached Europe alive have been thus domesticated by the natives. The adult bird in the wild state is exceedingly shy and difficult of approach, and, owing to its great fleetness and strength, is rarely if ever caught. It eats voraciously, and, like the ostrich, will swallow whatever comes in its way. (See Emeu.)

CAST (from the verb meaning "to throw"; the word is Scand. in origin, cf. Dan. *kaste*, and Swed. *kasta*; "cast" in Middle Eng. took the place of the A.S. *weorpan*, cf. Ger. *werfen*), a throw, or that which is thrown, or that into which something is thrown. From these three meanings come the main uses of the word; for the throwing of dice, with the figurative sense of a chance or opportunity, as in "at the last cast"; for the throwing of a fisherman's line in fly-fishing; for hounds spreading out in search of a lost scent; or, with the further meaning of a twisted throw or turn, for a slight squint in the eye. "Cast" is applied to a measure of herrings or other fish, being the amount taken in two hands to be thrown into a vessel, and similarly to a potter's measure for a certain quantity of clay; in fishing, to the casting line of gut with fly attached; to the hard refuse thrown out of the crop of a bird of prey, and to the coils of earth thrown up by earth-worms. From the old method, in making calculations, of using counters, which were thus "thrown" up into a heap, is probably derived the meaning of "cast" for the "casting up" of figures in an account. Further, the word is found for a mould for the casting of metals, and more particularly for the copy of an original statue or relief taken from a mould; similarly, of fossils, for the mineral filling of the empty mould left by the organism. Special uses of the word are also found in the theatrical term for the assignment of particular parts to the actors and actresses in a play, and in the many figurative senses of a type or stamp, as of features or characters.

CASTAGNO, ANDREA DEL (1390-1457), Italian painter of the Florentine school, was born in 1390, probably at Castagno, in the district of Mugello, and died in August 1457. He imitated Masaccio and the naturalists of his time in boldness of attitude, but was deficient in

grace and colouring. His name was for about four centuries burdened with the heinous charge of murder; it was said that he treacherously assassinated his colleague, Domenico Veneziano, in order to monopolize the then recent secret of oil painting as practised in Flanders by the Van Eycks. This charge has, however, been proved to be an untruth; Domenico died four years after Andrea. The latter is commonly called “Andrea (or Andreino) degl’ Impiccati” (of the Hanged Men); this was in consequence of his being commissioned in 1435 to paint, in the Palazzo del Podestà in Florence, the fallen leaders of the Peruzzi and Albizzi—not (as currently said) the men of the Pazzi conspiracy, an event which did not occur until 1478, long after this painter’s death. One of his principal works now extant (most of them have perished) is the equestrian figure of Nicola di Tolentino, in the cathedral of Florence.

CASTALIA, or Fons Castalius, a celebrated fountain in Greece, now called the Fountain of St John, which rises in a chasm of Mount Parnassus, in the neighbourhood of Delphi. It was sacred to Apollo and the Muses, and its water was used in the religious purifications of the “Pythian Pilgrims.” From its connexion with the Muses it is sometimes referred to by late Greek writers (*e.g.* Lucian, *Jup. Trag.* 30) and Latin poets (*e.g.* Ovid, *Am.* i. 15. 36) as a source of inspiration, and this has passed into a commonplace of modern literature. According to some authorities the nymph Castalia was the daughter of Achelous; according to others the water of the spring was derived from the Boeotian Cephissus.

CASTANETS (Fr. *castagnettes*, Ger. *Kastagnetten*, Span. *castañuelas*), instruments of percussion, introduced through the Moors by way of Spain into Europe from the East, used for marking the rhythm in dancing. Castanets, always used in pairs, one in each hand, consist of two pear or mussel-shaped bowls of hard wood, hinged together by a silk cord, the loop being passed over the thumb and first finger. The two halves are then struck against each other by the other fingers in single, double or triple beats, giving out series of hollow clicks of indefinite musical pitch. When intended for use in the orchestra the pair of castanets is mounted one at each end of a wooden stick about 8 in. long, which facilitates the playing. Castanets are also sometimes used in military bands and are then specially constructed. The two halves are kept open by a slight spring fixed to a frame attached to the hoop of a side drum, and the instrument is worked by the drummer with an ordinary drum-stick. An instance of the use of castanets in opera occurs in the Habanera in *Carmen*. A quaint description of *castinatts* is given in Harleian MS. 2034 (f. 208) at the British Museum (before 1688) with a pencil sketch which tallies very well with the above. The MS. is by Randle Holme and forms part of the *Academy of Armoury*. Castanets (κρόταλα) were used by the ancient Greeks, and also by the Romans (Lat. *crotalum, crotala*) to accompany the dances in the Dionysiac and Bacchanalian rites.

CASTE (through the Fr. from Span, and Port, *casta*, lineage, Lat. *castus*, pure). There are not many forms of social organization on a large scale to which the name “caste” has not been applied in a good or in a bad sense. Its Portuguese origin simply suggests the idea of family; but before the word came to be extensively used in modern European languages, it had been for some time identified with the Brahmanic division of Hindu society into classes. The corresponding Hindu word is *varna*, or colour, and the words *gati, kula, gotra, pravara* and *karana* are also used with different shades of meaning. Wherever, therefore, a writer has seen something which reminds him of any part of the extremely indeterminate notion, Indian caste, he has used the word, without regard to any particular age, race, locality or set of social institutions. Thus Palgrave[1] maintains that the colleges of operatives, which inscriptions prove to have existed in Britain during the Roman period, were practically

castes, because by the Theodosian code the son was compelled to follow the father's employment, and marriage into a family involved adoption of the family employment. But these *collegia opificum* seem to be just the forerunners of the voluntary associations for the regulation of industry and trade, the frith-gilds, and craft-gilds of later times, in which, no doubt, sons had great advantages as apprentices, but which admitted qualified strangers, and for which intermarriage was a matter of social feeling. The history of the formation of gilds shows, in fact, that they were really protests against the authoritative regulation of life from without and above. In the Saxon period, at any rate, there was nothing resembling caste in the strict sense. "The ceorl who had thriven so well as to have five hides of land rose to the rank of a thegn; his wergild became 1200 shillings; the value of his oath and the penalty of trespass against him increased in proportion; his descendants in the third generation became gesithcund. Nor was the character of the thriving defined; it might, so far as the terms of the custom went, be either purchase, or inheritance, or the receipt of royal bounty. The successful merchant might also thrive to thegn-right. The thegn himself might also rise to the rank, the estimation and status of an earl."[2] It has been said that early German history is, as regards this matter, in contrast with English, and that true castes are to be found in the military associations (*Genossenschaften*) which arose from the older class of Dienstmannen, and in which every member—page, squire or knight—must prove his knightly descent; the Bauernstand, or rural non-military population; the Bürgerstand, or merchant-class. The ministry of the Catholic Church in the West, was, however, never restricted by blood relation. There is no doubt that at some time or other professions were in most countries hereditary. Thus Prescott[3] tells us that in Peru, notwithstanding the general rule that every man should make himself acquainted with the various arts, "there were certain individuals carefully trained to those occupations which minister to the wants of the more opulent classes. These occupations, like every other calling and office in Peru, always descended from father to son. The division of castes was in this particular as precise as that which existed in Hindustan or Egypt." Again, Zurita[4] says that in Mexico no one could carry on trade except by right of inheritance, or by public permission. The Fiji carpenters form a separate caste, and in the Tonga Islands all the trades, except tattoo-markers, barbers and club-carvers are hereditary, —the separate classes being named matabooles, mooas and tooas. Nothing is more natural than that a father should teach his son his handicraft, especially if there be no organized system of public instruction; it gives the father help at a cheap rate, it is the easiest introduction to life for the son, and the custom or reputation of the father as a craftsman is often the most important legacy he has to leave. The value of transmitted skill in the simple crafts was very great; and what was once universal in communities still survives in outlying portions of communities which have not been brought within the general market of exchange. But so long as this process remains natural, there can be no question of caste, which implies that the adoption of a new profession is not merely unusual, but wrong and punishable. Then, the word caste has been applied to sacred corporations. A family or a tribe is consecrated to the service of a particular altar, or all the altars of a particular god. Or a semi-sacred class, such as the Brehons or the Bards, is formed, and these, and perhaps some specially dignified professions, become hereditary, the others remaining free. Thus in Peru, the priests of the Sun at Cuzco transmitted their office to their sons; so did the Quipu-camayoc, or public registrars, and the *amantas* and *haravecs*, the learned men and singers.[5] In many countries political considerations, or distinctions of race, have prevented intermarriage between classes. Take, for example, the patricians and the plebeians at Rome, or the Σπαρτιᾶται, Λάκωνες or περίοικοι, and the Εἵλωτες at Sparta. In Guatemala it was the law that if any noble married a plebeian woman he should be degraded to the caste of *mazequal*, or plebeian, and be subject to the duties and services imposed on that class, and that the bulk of his estate should be sequestered to the king.[6] In Madagascar marriage is strictly forbidden between the four classes of Nobles, Hovas, Zarahovas and Andevos,—the lowest of whom, however, are apparently mere slaves. In a sense slavery might be called the lowest of castes, because in most of its forms it does permit some small customary rights to the slave. In a sense, too, the survival in European royalty of the idea of "equality of birth" (*Ebenbürtigkeit*) is that of a caste conception, and the marriage of one of the members of a European royal family with a person not of royal blood might be described as an infraction of caste rule.

Caste in India is a question of more than historical interest. It is the great obstacle to government in accordance with modern ideas, and to the work of native religious reformers as well as of Christian missionaries. By some writers caste has been regarded as the great safeguard of social tranquillity, and therefore as the indispensable condition of the progress in certain arts and industries which the Hindus have made. Others, such as James Mill, have denounced it as fatal to the principle of free competition and opposed to individual happiness. The latter view assumes a state of facts which was denied by Colebrooke, one of

the highest authorities on Indian matters. Writing in 1798 he says,[7] after pointing out that any person unable to earn a subsistence by the exercise of his profession may follow the trade of a lower caste or even of a higher: “Daily observation shows even Brahmans exercising the menial profession of a Sudra. We are aware that every caste forms itself into clubs or lodges, consisting of the several individuals of that caste residing within a small distance, and that these clubs or lodges govern themselves by particular rules or customs or by-laws. But though some restrictions and limitations, not founded on religious prejudices, are found among their by-laws, it may be received as a general maxim that the occupation appointed for each tribe is entitled merely to a preference. Every profession, with few exceptions, is open to every description of persons; and the discouragement arising from religious prejudices is not greater than what exists in Great Britain from the effects of municipal and corporation laws. In Bengal the numbers of people actually willing to apply to any particular occupation are sufficient for the unlimited extension of any manufacture.” This was corroborated by Elphinstone,[8] who states that, during a long experience of India, he never heard of a single case of degradation from caste; and it is illustrated by the experience of the Indian army, in which men of all castes unite.[9]

The ordinary notion of modern caste is that it involves certain restrictions on marriage, on profession, and on social intercourse, especially that implied in eating and drinking together. How far intermarriage is permitted, what are the effects of a marriage permitted but looked on as irregular, what are the penalties of a marriage forbidden, whether the rules protecting trades and occupations are in effect more than a kind of unionism grown inveterate through custom, by what means caste is lost, and in what circumstances it may be regained,—these are questions on which very little real or definite knowledge exists. Sir H. Risley regards the absolute prohibition of mixed marriages as now the essential and most prominent characteristic. It is very remarkable that the Vedas, on which the whole structure of Brahmanic faith and morals professes to rest, give no countenance to the later regulations of caste. The only passage bearing on the subject is in the Purusha Sukta, the 90th Hymn of the 10th Book of the Rigveda Samhita. “When they divided man, how many did they make him? What was his mouth? what his arms? what are called his thighs and feet? The Brahmana was his mouth, the Raganya was made his arms, the Vaisya became his thighs, the Sudra was born from his feet.” Martin Haug finds in this a subtle allegory that the Brahmans were teachers, the Kshatriyas the warriors of mankind. But this is opposed to the simple and direct language of the Vedic hymns, and to the fact that in the accounts of creation there the origin of many things besides classes of men is attributed in the same fanciful manner to parts of the divine person. It is in the Puranas and the Laws of Manu, neither of which claims direct inspiration, where they differ from the letter of the Veda, that the texts are to be found on which all that is objectionable in caste has been based. Even in the Vishnu Purana, however, the legend of caste speaks of the four classes as being at first “perfectly inclined to conduct springing from religious faith.” It is not till after the whole human race has fallen into sin that separate social duties are assigned to the classes. The same hymn speaks of the evolution of qualities of Brahma. Sattva, or goodness, sprang from the mouth of Brahma; Rajas, or passion, came from his breast; Tamas, or darkness, from his thighs; others he created from his feet. For each one of these gunas, or primitive differences of quality, a thousand couples, male and female, have been created, to which the distinct heavens, or places of perfection of Prajapati, Indra, Maruts and Gandharvas are assigned. To the gunas are related the yugas, or ages: 1st, the Krita, or glorious age of truth and piety, in which apparently no distinctions, at least no grades of excellence were known; 2nd, the Treta, or period of knowledge; 3rd, the Dvapara, or period of sacrifice; 4th, the Kali, or period of darkness. Bunsen supposes there may be an historical element in the legend that Pururava, a great conqueror of the Treta age, founded caste. The yugas are hardly periods of historical chronology, but there is no doubt that the Vayu Purana assigns the definite origin of caste to the Treta period. “The perfect beings of the first age, some tranquil, some fiery, some active and some distressed, were again born in the Treta, as Brahmans, &c., governed by the good and bad actions performed in former births.” The same hymn proceeds to explain that the first arrangement did not work well, and that a second was made, by which force, criminal justice and war were declared to be the business of the Kshatriyas; officiating at sacrifices, sacred study and the receipt of presents to belong to the Brahmans; traffic, cattle and agriculture to the Vaisyas; the mechanical arts and service to the Sudras. The Ramayana hymn suggests that in the four great periods the castes successively arrive at the state of *dharma* or righteousness. Thus, a Sudra cannot, even by the most rigorous self-mortification, become righteous in the period proper to the salvation of the Vaisyas. As the hymn speaks in the Dvapara age, it speaks of the salvation of Sudras as future, and not yet possible. Wholly in opposition to the story of a fourfold birth from Brahma is the legend that the castes sprang from Manu himself, who is removed by several generations of gods and demi-gods from Brahma. Then, again, the

Santiparvan alleges that the world, at first entirely Brahmanic, was separated into castes merely by the evil works of man. Castehood consists in the exercise of certain virtues or vices. *Munis*, or persons born indiscriminately, frequently rise to the caste of Brahmans, and the offspring of Brahmans sink to a lower level. The serpent observes: “If a man is regarded by you as being a Brahman only in consequence of his conduct, then birth is vain, until action is shown.” But this change of caste takes place only through a second, birth, and not during the life which is spent in virtue. Another poetical conception of caste birth is expressed in the Harivamsa. The Brahmans were formed from an imperishable element (Akshara), the Kshatriyas from a perishable element (Kshara), the Vaisyas from alteration, and the Sudras from a modification of smoke.

The general result of the foregoing texts is that several contradictory accounts have been given of the origin of caste, and that these are for the most part unintelligible. Caste is described as a late episode in creation, and as born from different parts of different gods, from the mortal Manu, from abstract principles, and from non-entity. It is also described as coeval with creation, as existing in perfection during the Krita period, and subsequently falling into sin. It is also said that only Brahmans existed at first, the others only at later periods. Then the rationalistic theories of the Santiparvan upset the very foundation of caste, viz. hereditary transmission of the caste character.[10] It seems clear that when the Vedas were composed, many persons who were not Brahmans acted as priests, and saints, the “preceptors of gods,” by their “austere fervour,” rose from a lower rank to the dignity of Brahmanhood. Originally, indeed, access to the gods by prayer and sacrifice was open to all classes of the community. As the Brahmans grow in political importance, they make religion an exclusive and sacred business. We find them deciding questions of succession to the throne, and enforcing their decisions. While in the earlier literature there are several instances of Brahmans receiving instruction from the hands of Kshatriyas, in the Puranas and Manu death is made to overtake Kshatriyas who are not submissive to the Brahmans; and in one case Visvamitra, the son of Gadhi, actually obtains Brahmanhood as a reward for his submission. It seems certain that many of the ancient myths were expressly manufactured by the Brahmans to show their superiority in birth and in the favour of Heaven to the Kshatriyas —a poetical effect which is sometimes spoiled by their claiming descent from their rivals. This brings us to a consideration of the theories which have been started to account for the appearance of Brahmanic caste, as it is stereotyped in the Laws of Manu. James Mill, who invariably underestimated the influence on history of “previous states of society,” suggested that the original division must have been the work of some inspired individual, a legislator or a social reformer, who perceived the advantages which would result from a systematic division of labour. The subordination of castes he accounts for by the superstitious terror and the designing lust of power which have so frequently been invoked to explain the natural supremacy of the religious class. Because the ravages of war were dreaded most after the calamities sent by heaven, he finds that the military class properly occupy the second place. This arrangement he apparently contemplates as at no time either necessary or wholesome, and as finally destroyed by the selfish jealousies of caste, and by the degradations which the multiplication of trades made inevitable. Heeren[11] and Klaproth have contended that the division into castes is founded on an original diversity of race, and that the higher castes are possessed of superior beauty. The clear complexion and regular features of the Brahmans are said to distinguish them as completely from the Sudras as the Spanish Creoles were distinguished from the Peruvians. “The high forehead, stout build, and light copper colour of the Brahmins and other castes allied to them, appear in strong contrast with the somewhat low and wide heads, slight make, and dark bronze of the low castes” (Stevenson, quoted by Max Müller, *Chips*, ii. p. 327).[12] This explanation is, however, generally conjoined with that founded on the tradition of conquest by the higher castes. There is no doubt that the three castes of lighter colour (traivarnika), the white Brahmans, the red Kshatriyas, the yellow Vaisyas, are, at least in the early hymns and Brahmanas, spoken of as the Aryas, the Sanskrit-speaking conquerors, in contradistinction to the dark cloud of the Turanian aborigines Dasyus. In fact ârya, which means noble, is derived from ărya, which means householder, and was the original name of the largest caste, now called Vaisyas. The great Sanskrit scholar, Rudolf von Roth (1821-1895), in his *Brahma und die Brahmanan*[13] held that the Vedic people advanced from their home in the Punjab, drove the aborigines into the hills, and took possession of the country lying between the Ganges, the Jumna and the Vindhya range. “In this stage of complication and disturbance,” he said, “power naturally fell into the hands of those who did not possess any direct authority,” *i.e.* the domestic priests of the numerous tribal kings. The Sudras he regarded as a conquered race, perhaps a branch of the Aryan stock, which immigrated at an earlier period into India, perhaps an autochthonous Indian tribe. The latter hypothesis is opposed to the fact that, while the Sudra is debarred from sharing three important Vedic sacrifices, the Bhagasata Purana expressly permits him to

sacrifice "without *mantras*," and imposes on him duties with reference to Brahmans and cows which one would not expect in the case of a nation strange in blood. But unless a previous subordination of castes among the conquering race be supposed, it seems difficult to see why the warrior-class, who having contributed most to the conquest must have been masters of the situation, should have consented to degradation below the class of Brahmans. The position of the Sudra certainly suggests conquest. But are there sound historical reasons for supposing that Brahmans and Sudras belonged to different nations, or that either class was confined to one nation? The hypothesis was held in a somewhat modified form by Meiners,[14] who supposed that instead of one conquest there may have been two successive immigrations,—the first immigrants being subdued by the second, and then forming an intermediate class between their conquerors and the aborigines; or, if there were no aborigines, the mixture of the two immigrant races would form an intermediate class. In the same way Talboys Wheeler[15] suggested that the Sudra may be the original conquerors of the race now represented by the Pariahs. Most of these explanations seem rather to describe the mode in which the existing institutions of caste might be transplanted from one land to another, from a motherland to its colonies, and altered by its new conditions. Military conquest, though it often introduces servitude, does not naturally lead to the elevation of the priesthood. It is unscientific to assume large historical events, or large ethnological facts, or the existence of some creator of social order.[16]

As Benjamin Constant[17] points out, caste rests on the religious idea of an indelible stain resting on certain men, and the social idea of certain functions being committed to certain classes. The idea of physical purity was largely developed under the Mosaic legislation; in fact the internal regulations of the Essenes (who were divided into four classes) resemble the frivolous prohibitions of Brahmanism. As the daily intercourse of men in trade and industry presents numberless occasions on which the stain of real or fancied impurity might be caught, the power of the religious class who define the rules of purity and the penalties of their violation becomes very great. Moreover, the Hindus are deeply religious, and therefore naturally prepared for Purohiti or priest-rule. They were also passionately attached to their national hymns, some of which had led them to victory, while others were associated with the benign influences of nature. Only the priest could chant or teach these hymns, and it was believed that the smallest mistake in pronunciation would draw down the anger of the gods. But however favourable the conditions of spiritual dominion might be, it seems to have been by no more natural process than hard fighting that the Brahmans finally asserted their supremacy. We are told that Parasurama, the great hero of the Brahmans, "cleared the earth thrice seven times of the Kshatriya caste, and filled with their blood the five large lakes of Samauta." Wheeler thinks that the substitution of blood-sacrifices for offerings of parched grain, clarified butter and *soma* wine marks an adaptation by the Brahmans of the great military banquets to the purposes of political supremacy. It is not, therefore, till the Brahmanic period of Indian history, which ends with the coming of Sakya Muni, in 600 B.C., that we find the caste-definitions of Manu realized as facts. These are—"To Brahmans he (*i.e.* Brahma) assigned the duties of reading the Vedas, of teaching, of sacrificing, of assisting others to sacrifice, of giving alms if they be rich, and if indigent of receiving gifts."[18] The duties of the Kshatriya are "to defend the people, to give alms, to sacrifice, to read the Veda, to shun the allurements of sensual gratification." The duties of a Vaisya are "to keep herds of cattle, to bestow largesses, to sacrifice, to read the scripture, to carry on trade, to lend at interest, and to cultivate land." These three castes (the twice born) wear the sacred thread. The one duty of a Sudra is "to serve the before-mentioned classes without depreciating their worth."[19] The Brahman is entitled by primogeniture to the whole universe; he may eat no flesh but that of victims; he has his peculiar clothes. He is bound to help military and commercial men in distress. He may seize the goods of a Sudra, and whatever the latter acquires by labour or succession beyond a certain amount. The Sudra is to serve the twice born; and even when emancipated cannot be anything but a Sudra. He may not learn the Vedas, and in sacrifice he must omit the sacred texts. A Sudra in distress may turn to a handicraft; and in the same circumstances a Vaisya may stoop to service. Whatever crime a Brahman might commit, his person and property were not to be injured; but whoever struck a Brahman with a blade of grass would become an inferior quadruped during twenty-one transmigrations. In the state the Brahman was above all the ministers; he was the raja's priest, exempt from taxation, the performer of public sacrifices, the expounder of Manu, and at one time the physician of bodies as well as of souls. He is more liable than less holy persons to pollution, and his ablutions are therefore more frequent. A Kshatriya who slandered a Brahman was to be fined 100 panas (a copper weight of 200 grains); a Vaisya was fined 200 panas; a Sudra was to be whipped. A Brahman slandering any of the lower castes pays 50, 25 or 12 panas. In ordinary salutations a Brahman is asked whether his devotion has prospered; a Kshatriya, whether he has suffered from his wounds; a Vaisya

whether his health is secure; a Sudra whether he is in good health.[20] In administering oaths a Brahman is asked to swear by his veracity; a Kshatriya by his weapons, house or elephant; a Vaisya by his kine, grain or goods; a Sudra by all the most frightful penalties of perjury. The Hindu mind is fertile in oaths; before the caste assembly the Dhurm, or caste custom, is sometimes appealed to, or the feet of Brahma, or some cow or god or sacred river, or the bel (the sacred creeper), or the roots of the turmeric plant. The castes are also distinguished by their modes of marriage. Those peculiar to Brahmans seem to be—1st, Brahma, when a daughter, clothed only with a single robe, is given to a man learned in the Veda whom her father has voluntarily invited and respectfully receives; 2nd, Devas or Daiva, when a daughter, in gay attire is given, when the sacrifice is already begun, to the officiating priest. The primitive marriage forms of Rashasas or Rachasa, when a maiden is seized by force from home, while she weeps and calls for help, is said to be appropriate to Kshatriyas. To the two lower castes the ceremony of Asura is open, in which the bridegroom, having given as much wealth as he can afford to the father and paternal kinsman and to the damsel herself, takes her voluntarily as his bride. A Kshatriya woman on her marriage with a Brahman must hold an arrow in her hand; a Vaisya woman marrying one of the sacerdotal or military classes must hold a whip; a Sudra woman marrying one of the upper castes must hold the skirt of a mantle.

How little the system described by Manu applies to the existing castes of India may be seen in these facts—(1) that there is no artisan caste mentioned by Manu; (2) that eating with another caste, or eating food prepared by another caste, is not said by him to involve loss of caste, though these are now among the most frequent sources of degradation. The system must have been profoundly modified by the teaching of Buddha: “As the four rivers which fall into the Ganges lose their names as soon as they mingle their waters with the holy river, so all who believe in Buddha cease to be Brahmans, Kshatriyas, Vaisyas, and Sudras.” After Buddha, Sudra dynasties ruled in many parts of India, and under the Mogul dynasty the Cayets, a race of Sudras, had almost a monopoly of public offices. But Buddha did not wish to abolish caste. Thus it is related that a Brahman Pundit who had embraced the doctrines of Buddha nevertheless found it necessary, when his king touched him, to wash from head to foot.[21] Alexander the Great found no castes in the Punjab, but Megasthenes had left an account of the ryots and tradesmen, the military order and the gymnosophists (including the Buddhist Germanes) whom he found in the country of the Ganges.[22] From his use of the word gymnosophist it is probable that Megasthenes confounded the Brahmans with the hermits or fakirs; and this explains his statement that any Hindu might become a Brahman. Megasthenes spent some time at the court of Sandracottus (Chandragupta Maurya), a contemporary of Seleucus Nicator. All the later Greeks[23] follow his statement and concur in enumerating seven Indian castes—sophists, agriculturists, herdsmen, artisans, warriors, inspectors, councillors. On the revival of Brahmanism it was found that the second and third castes had disappeared, and that the field was now occupied by the Brahmans, the Sudras, and a host of mixed castes, sprung from the original twelve, Unulum and Prutilum, left-hand and right-hand, which were formed by the crossing of the four original castes. Manu himself gives a list of these impure castes, and the Ain-i-Akbari (1556-1605) makes the positive statement that there were then 500 tribes bearing the name of Kshatriya, while the real caste no longer existed. Most of these subdivisions are really trade-organizations, many of them living in village-communities, which trace descent from a pure caste. Thus in Bengal there are the Vaidya or Baidya, the physicians, who, Manu says, originated in the marriage of a Brahman father and a Vaisya mother.

As Colebrooke said, Brahmans and Sudras enter into all trades, but Brahmans (who are profoundly ignorant even of their own scriptures) have succeeded in maintaining their monopoly of Vedic learning, which really means a superficial acquaintance with the Puranas and Manu. Though they have succeeded in excluding others from sacred employment, only a portion of the caste are actually engaged in religious ceremonies, in sacred study, or even in religious begging. Many are privates in the army, many water-carriers, many domestic servants. And they have, like other castes, many subdivisions which prevent intimate association and intermarriage. The ideal Brahman is gone: the priest “with his hair and beard clipped, his passions subdued, his mantle white, his body pure, golden rings in his ear.” But the hold which caste has on the Hindu minds may, perhaps, be most clearly seen in the history of the Christian missions and in comparatively recent times. The Jesuits Xavier and Fra dei Nobili did everything but become Brahmans in order to convert the south of India—they put on a dress of cavy or yellow colour, they made frequent ablutions, they lived on vegetables and milk, they put on their foreheads the sandalwood paste used by the Brahmans—and Gregory XV. published a bull sanctioning caste regulations in the Christian churches of India. The Danish mission of Tranquebar, the German mission of the heroic Schwarz, whose headquarters were Tanjore, also permitted caste to be retained by their followers. Even the

priests of Buddha, whose life was a protest against caste, re-erected the system in the island of Ceylon, where the *radis* or *radias* were reduced to much the same state as the Pariahs.[24] Protestant missions have made but little progress, even in recent years. The number of native converts to Christianity rose from 1,246,000 in 1872 to 2,664,000 in 1901; these figures, however, are by themselves rather misleading, for Christianity appears to have touched the higher classes in India not at all, only the out-castes.

It is still the general law that to constitute a good marriage the parties must belong to the same caste, but to unconnected families. Undoubtedly, however, the three higher castes were always permitted to intermarry with the caste next below their own, the issue taking the lower caste or sometimes forming a new class. A Sudra need not marry a wife of the same caste or sect as himself. In 1871 it was decided by the judicial committee of the privy council that a marriage between a zemindar (land-owner) of the Malavar class, a subdivision of the Sudra caste, with a woman of the Vellala class of Sudras is lawful. Generally also a woman may not marry beneath her own caste. The feeling is not so strong against a man marrying even in the lowest caste, for Manu permits the son of a Brahman and a Sudra mother to raise his family to the highest caste in the seventh generation. The illegitimacy resulting from an invalid marriage does not render incapable of caste; at least it does not so disqualify the lawful children of the bastard. On a forfeiture of caste by either spouse intercourse ceases between the spouses: if the out-caste be a sonless woman, she is accounted dead, and funeral rites are performed for her; if she have a son, he is bound to maintain her. It is remarkable that the professional concubinage of the dancing-girl does not involve degradation, if it be with a person of the same caste. This suggests that whatever may be the function of caste, it is not a safe guardian of public morality. The rules as to prohibited degrees in marriage used to be very strict, but they are now relaxed. An act of 1856 legalized remarriage by widows in all the castes, with a conditional forfeiture of the deceased husband’s estate, unless the husband has expressly sanctioned the second marriage. The later Indian Marriage Act was directed against the iniquitous child marriages; it requires a *minimum* age. In many ways the theoretical inferiority of the Sudra absolves him from the restraints which the letter of the law lays on the higher castes. Thus a Sudra may adopt a daughter’s or sister’s son, though this is contrary to the general rule that the adopter should be able to marry the mother of the adopted person. The rule requiring the person adopted to be of the same caste and *gotra* or family as the adopter is also dispensed with in the case of Sudras. In fact, it is only a married person whom a Sudra may not adopt. As regards inheritance the Sudra does not come off so well in competition with the other castes. “The sons of a Brahamana in the several tribes have four shares or three or two or one; the children of a Kshatriya have three portions or two or one; and those of a Vaisya take two parts or one.” This refers to the case permitted by law, and not unknown in practice, of a Brahman having four wives of different castes, a Kshatriya three, and so on. But all sons of inferior caste are excluded from property coming by gift to the father; and a Sudra son is also excluded from land acquired by purchase. It must be recollected, however, that under an act of 1850, *loss* of caste no longer affects the capacity to inherit or to be adopted. In cases of succession *ab intestato* on failure of the preceptor, pupil, and fellow-student (heirs called by the Hindu law after relatives), a priest, or any Brahman, many succeed. Where a Sudra is the only son of a Brahman, the Sapinda, or next of kin, would take two-thirds of the inheritance; where he is the only son of any other twice-born father, the Sapinda would take one-half. Possibly, the rule of equal division among sons of equal caste did not at first apply to Brahmans, who, as the eldest sons of God, would perhaps observe the custom of primogeniture among themselves. On the other hand it was laid down in the judicial committee in 1869, contrary to the collected opinions of the Pundits of the Sudder court, that, in default of lawful children, the illegitimate children of the Sudra caste inherit their putative father’s estate, and, even if there be lawful children, are entitled to maintenance out of the estate. It had previously been decided by Sir Edward Ryan in 1857 that the illegitimate children of a Rajput, or of any other member of a superior caste, have no right of inheritance even under will, but a mere right to maintenance, provided the children are docile. It seems then that the Kshatriya and Vaisya castes, though in one sense non-existent, still control Hindu succession.

With regard to Persia the *Zend Avesta* speaks of a fourfold division of the ancient inhabitants of Iran into priests, warriors, agriculturists and artificers; and also of a sevenfold division corresponding to the seven amschespands, or servants of Ormuzd. This was no invention of Zoroaster, but a tradition from the golden age of Jemshid or Diemschid. The priestly caste of Magi was divided into Herbeds or disciples, Mobeds or masters, and Destur Mobeds or complete masters. The last-named were alone entitled to read the liturgies of Ormuzd; they alone predicted the future and carried the sacred *costi*, or girdle, *havan*, or cup, and *barsom*, or bunch of twigs. The Zend word *baresma* is supposed to be connected

with Brahma, or sacred element, of which the symbol was a bunch of kusa grass, generally called veda. The Persian and Hindu religions are further connected by the ceremony called Homa in the one and Soma in the other. Haug, in his *Tract on the Origin of Brahmanism* (quoted by Muir, *ubi supra*), maintains that the division in the *Zend Avesta* of the followers of Ahura Mazda into Atharvas, Rathaesvas, and Vastrya was precisely equivalent to the three superior Indian castes. He also asserts that only the sons of priests (Atharvas) could become priests, a rule still in force among the Parsis. The Book of Daniel rather suggests that the Magi were an elective body; and as regards the secular classes there does not seem to be a trace of hereditary employment or religious subordination. There is a legend in the Dabistan of a great conqueror, Mahabad, who divided the Abyssinians into the usual four castes; and Strabo mentions a similar classification of the Iberians into kings, priests, soldiers, husbandmen and menials.

At one time it was the universal opinion that in Egypt there were at least two great castes, priests and warriors, the functions of which were transmitted from father to son, the minor professions grouped under the great castes being also subject to hereditary transmission. This opinion was held by Otfried Müller,[25] Meiners of Göttingen, and others. Doubts were first suggested by Rossellini, and after Champollion had deciphered the hieroglyphic inscriptions, J.J. Ampère[26] boldly announced that there were in Egypt no castes strictly so called; that in particular the professions of priest, soldier, judge, &c., were not hereditary; and that the division of Egyptian society was merely that which is generally found in certain stages of social growth between the liberal professions and the mechanical arts and trades. No difference of colour, or indeed of any feature, has been observed in the monumental pictures of the different Egyptian castes. From an inspection of numerous tombs, sarcophagi, and funeral stones, which frequently enumerate the names and professions of several kinsfolk of the deceased, Ampère concluded that sacerdotal and military functions were sometimes united in the same person, and might even be combined with civil functions; that intermarriage might certainly take place between the sacred and military orders; and that the members of the same natural family did frequently adopt the different occupations which had been supposed to be the exclusive property of the castes. The tombs of Beni Hassan show in a striking manner the Egyptian tendency to accumulate, rather than to separate, employments. Occasionally families were set apart for the worship of a particular divinity. An interesting “section” of Egyptian society is afforded by a granite monument preserved in the museum at Naples. Nine figures in bas-relief represent the deceased, his father, three brothers, a paternal uncle, and the father and two brothers of his wife. Another side contains the mother, wife, wife’s mother and maternal aunts. The deceased is described as a military officer and superintendent of buildings; his elder brother as a priest and architect; his third brother as a provincial governor, and his father as a priest of Ammon. The family of the wife is exclusively sacerdotal. Egyptian caste, therefore, permitted two brothers to be of different castes, and one person to be of more castes than one, and of different castes from those to which his father or wife belonged. The lower employments, commerce, agriculture, even medicine, are never mentioned on the tombs. The absolute statements about caste in Egypt, circulated by such writers as Reynier and De Goguet, have, no doubt, been founded on passages in Herodotus (ii. 143, 164), who mentions seven classes, and makes war an hereditary profession; in Diodorus Siculus (i. 2-8), who mentions five classes and a hereditary priesthood; and in Plato, who, anxious to illustrate the principle of compulsory division of labour, on which his republic was based, speaks in the *Timaeus* of a total separation of the six classes—priests, soldiers, husbandmen, artisans, hunters and shepherds. Heeren (ii. 594) does not hesitate to ascribe the formation of Egyptian caste to the meeting of different races. According to the chronology constructed by Bunsen the division into castes began in the period 10,000-9000, and was completed along with the introduction of animal worship and the improvement of writing under the third dynasty in the 6th or 7th century of the Old Empire. The Scholiast of Apollonius Rhodius, on the authority of Dicaearchus, in the Second Book of *Hellas*, mentions a king, Sesonchosis, who, about 3712 B.C., “enacted that no one should abandon his father’s trade, for this he considered as leading to avarice.” Bunsen conjectures that this may refer to Sesostoris, the lawgiver of Manetho’s third or Memphite dynasty, the eighth from Menes, who introduced writing, building with hewn stone, and medicine; possibly, also, to Sesostris, who, Aristotle says (*Polit.* vii. 1), introduced caste to Crete. He further observes that in Egypt there was never a conquered indigenous race. There was one nation with one language and one religion; the public panegyrics embraced the whole people; every Egyptian was the child and friend of the gods. The kings were generally warriors, and latterly adopted into the sacerdotal caste. Intermarriage was the rule, except between the swineherds and all other classes. “Every shepherd is an abomination unto the Egyptians” (Gen. xlvi. 34).

The comprehensive essay by Sir H.H. Risley in the introductory volume of the Indian

Census Report for 1901 is the best recent account of caste in India. See also, besides the works mentioned in the text, Sir Denzil Ibbetson's *Report on the Punjab Census* (1881); W. Cropke, *Things Indian* (1905) and other books by this author on Indian religion and caste; Senart, *Les Castes dans l'Inde* (1896); Jogendra Nath Bhattacharya, *Hindu Castes and Sects* (1896). There is an interesting chapter on the subject in Sidney Low's *Vision of India* (1906). See also India, Indian Law, and Hinduism.

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1 *History of Rise and Progress of the English Constitution*, i. 332.

2 Stubbs' *Constitutional History of England*, i. p. 162.

3 *History of Peru*, i. 143.

4 *Rapport sur les différentes classes de chefs dans la nouvelle Espagne* (1840), p. 223.

5 Something like this is to be found in the Russian notion of *chin*, or status according to official hierarchy of ranks, as modified by the custom of *myestnichestvo*, by which no one entering the public service could be placed beneath a person who had been subject to his father's orders. Hereditary nobility at one time belonged to every servant, military or civil, above a certain rank, and a family remaining out of office for two generations lost its rights of nobility; but in 1854 the privilege was confined to army colonels and state councillors of the 4th class. At one time, therefore, the *razryadniya knighi*, or special registers, superseded by Peter the Great's *barkhatnaya kniga*, or Velvet Book, contained a complete code of social privilege and precedence. Peter's "*tabel o rangakh*" contained fourteen classes. The subject is treated of in the 1600 articles of the ninth volume of the Russian Code *Svod Zakonov*. The Russian Nobility, though deprived of their exemptions from conscription, personal taxation and corporal punishment, still retain many advantages in the public service.

6 Juarros, *Hist. of Guatemala*, Tr. (London, 1823).

7 *Life and Essays of H.T. Colebrooke*, i. p. 104.

8 *History of India*.

9 "The crudities and cruelties of the caste system need not blind us to its other aspects. There is no doubt that it is the main cause of the fundamental stability and contentment by which Indian society has been braced up for centuries against the shocks of politics and the cataclysms of Nature. It provides every man with his place, his career, his occupation, his circle of friends. It makes him, at the outset, a member of a corporate body: it protects him through life from the canker of social jealousy and unfulfilled aspirations; it ensures him companionship and a sense of community with others in like case with himself. The caste organization is to the Hindu his club, his trade union, his benefit society, his philanthropic society. An Indian without caste, as things stand at present, is not quite easy to imagine." (Sidney Low, *Vision of India*, 1906, ch. xv. p. 263).

10 Muir's *Sanskrit Texts*, vol. i. (1868).

11 *Ideen*, i. 610.

12 The idea of a conquering white race is strangely repeated in the later history of India. The Rajputs and Brahmans are succeeded by the Mussulmans, the Turks, the Afghans. There was an aristocracy of colour under the Mogul dynasty. But under an Indian climate it could not last many generations. The Brahmans of southern India were as black as the lowest castes; the Chandalas are said to be descended from Brahmans. According to Manu the Chandala must not dwell within town; his sole wealth must be dogs and asses; his clothes must consist of the mantles of deceased persons; his dishes must be broken pots. Surely this vituperative description must apply to an aboriginal race.

13 *Zeitschrift der deutschen morgenländischen Gesellschaft*, Band i. (quoted by Muir, *ubi supra*).

14 *De Origine Castarum* (Göttingen).

15 *History of India*, vol. i. (1867-1871).

16 For a characteristic appreciation of caste see Comte, *Cours de philosophic positive*, vi. c. 8. He regards the hereditary transmission of functions under the rule of a sacerdotal class as a necessary and universal stage of social progress, greatly modified by war and colonization. The morality of caste was, he contends, an improvement on what preceded; but its permanence was impossible, because "the political rule of intelligence is hostile to human progress." The seclusion of women and the preservation of industrial inventions were features of caste; and the higher priests were also magistrates, philosophers, artists, engineers, and physicians.

17 *De la religion*, ii. 8.

18 The great mass of the Brahmans were in reality mendicants, who lived on the festivals of birth, marriage, and death, and on the fines exacted for infractions of caste rule. Others had establishments called Muths, endowed with Jagir villages. There were two distinct orders of officiating priests—the Purohita, or family priest, who performed all the domestic rites, and probably gave advice in secular matters, and the Guru, who is the head of a religious sect, making tours of superintendence and exaction, and having the power to degrade from caste and to

restore. In some cases the Guru is recognized as the Mehitra or officer of the caste assembly, from whom he receives Huks, or salary, and an exemption from house and stamp taxes, and service as begarree (Steele's *Law and Customs of Hindoo Castes within the Dekhan Provinces*, 1826; later edition, 1868). Expulsion from caste follows on a number of moral offences (*e.g.* assault, murder, &c.), as well as ceremonial offences (*e.g.* eating prohibited food, eating with persons of lower caste, abstaining from funeral rites, having connexion with a low-caste woman). Exclusion means that it is not allowed to eat with or enter the houses of the members of the caste, the offender being in theory not degraded but dead. For some heinous offences, *i.e.* against the express letter of the Shasters, no readmission is possible. But generally this depends on the ability of the out-caste to pay a fine, and to supply the caste with an expiatory feast of sweetmeats. He has also to go through the Sashtanyam, or prostration of eight members, and to drink the Panchakaryam, *i.e.* drink of the five products of the cow (*Description of People of India*, Abbé J.A. Dubois, Missionary in Mysore, Eng. Trans., London, 1817; edition by Pope, Madras, 1862).

19 *Manu*. x. 88-90.

20 Wheeler ii. 533.

21 *Travels of Fah Hian*, c. 27.

22 Strabo, *Ind.* sec. 59.

23 Arrian, *Indic.* c. 11, 12; Diod. Sic. ii. c. 40, 41; and Strabo xv. 1.

24 Irving, *Theory and Practice of Caste* (London, 1859).

25 *Manual of Archaeology*.

26 *Revue des deux mondes*, 15th September 1848.

CASTEL, LOUIS BERTRAND (1688-1757), French mathematician, was born at Montpellier on the 11th of November 1688, and entered the order of the Jesuits in 1703. Having studied literature, he afterwards devoted himself entirely to mathematics and natural philosophy. He wrote several scientific works, that which attracted most attention at the time being his *Optique des couleurs* (1740), or treatise on the melody of colours. He endeavoured to illustrate the subject by a *clavecin oculaire*, or ocular harpsichord; but the treatise and the illustration were quickly forgotten. He also wrote *Mathématique universelle* (1728) and *Traité de physique sur la pesanteur universelle des corps* (1724). He also published a critical account of the system of Sir Isaac Newton in French in 1743.

CASTELAR Y RIPOLL, EMILIO (1832-1899), Spanish statesman, was born at Cadiz on the 8th of September 1832. At the age of seven he lost his father, who had taken an active part in the progressist agitations during the reign of Ferdinand VII., and had passed several years as an exile in England. He attended a grammar-school at Sax. In 1848 he began to study law in Madrid, but soon elected to compete for admittance at the school of philosophy and letters, where he took the degree of doctor in 1853. He was an obscure republican student when the Spanish revolutionary movement of 1854 took place, and the young liberals and democrats of that epoch decided to hold a meeting in the largest theatre of the capital. On that occasion Castelar delivered his maiden speech, which at once placed him in the van of the advanced politicians of the reign of Queen Isabella. From that moment he took an active part in politics, radical journalism, literary and historical pursuits. Castelar was compromised in the first rising of June 1866, which was concerted by Marshal Prim, and crushed, after much bloodshed, in the streets by Marshals O'Donnell and Serrano. A court-martial condemned him *in contumaciam* to death by "garote vil," and he had to hide in the house of a friend until he escaped to France. There he lived two years until the successful revolution of 1868 allowed him to return and enter the Cortes for the first time—as deputy for Saragossa. At the same time he resumed the professorship of history at the Madrid university. Castelar soon became famous by his rhetorical speeches in the Constituent Cortes of 1869, where he led the republican minority in advocating a federal republic as the logical outcome of the recent revolution. He thus gave much trouble to men like Serrano, Topete and Prim, who had never harboured the idea of drifting into advanced democracy, and who

had each his own scheme for re-establishing the monarchy with certain constitutional restrictions. Hence arose Castelar's constant and vigorous criticisms of the successive plans mooted to place a Hohenzollern, a Portuguese, the duke of Montpensier, Espartero and finally Amadeus of Savoy on the throne. He attacked with relentless vigour the short-lived monarchy of Amadeus, and contributed to its downfall.

The abdication of Amadeus led to the proclamation of the federal republic. The senate and congress, very largely composed of monarchists, permitted themselves to be dragged along into democracy by the republican minority headed by Salmeron, Figueras, Pi y Margall and Castelar. The short-lived federal republic from the 11th of February 1873 to the 3rd of January 1874 was the culminating point of the career of Castelar, and his conduct during those eleven months was much praised by the wiser portion of his fellow-countrymen, though it alienated from him the sympathies of the majority of his quondam friends in the republican ranks.

Before the revolution of 1868, Castelar had begun to dissent from the doctrines of the more advanced republicans, and particularly as to the means to be employed for their success. He abhorred bloodshed, he disliked mob rule, he did not approve of military *pronunciamientos*. His idea would have been a parliamentary republic on the American lines, with some traits of the Swiss constitution to keep in touch with the regionalist and provincialist inclinations of many parts of the peninsula. He would have placed at the head of his commonwealth a president and Cortes freely elected by the people, ruling the country in a liberal spirit and with due respect for conservative principles, religious traditions and national unity. Such a statesman was sure to clash with the doctrinaires, like Salmeron, who wanted to imitate French methods; with Pi y Margall, who wanted a federal republic after purely Spanish ideas of decentralization; and above all with the intransigent and gloomy fanatics who became the leaders of the cantonal insurrections at Cadiz, Seville, Valencia, Malaga and Cartagena in 1873.

At first Castelar did his best to work with the other republican members of the first government of the federal republic. He accepted the post of minister for foreign affairs. He even went so far as to side with his colleagues, when serious difficulties arose between the new government and the president of the Cortes, Señor Martos, who was backed by a very imposing commission composed of the most influential conservative members of the last parliament of the Savoyard king, which had suspended its sittings shortly after proclaiming the federal republic. A sharp struggle was carried on for weeks between the executive and this commission, at first presided over by Martos, and, when he resigned, by Salmeron. In the background Marshal Serrano and many politicians and military men steadily advocated a *coup d'état* in order to avert the triumph of the republicans. The adversaries of the executive were prompted by the captain-general of Madrid, Pavia, who promised the co-operation of the garrison of the capital. The president, Salmeron, and Marshal Serrano himself lacked decision at the last moment, and lost time and many opportunities by which the republican ministers profited. The federal republicans became masters of the situation in the last fortnight of April 1873, and turned the tables on their adversaries by making a pacific bloodless *pronunciamiento*.

The battalions of the militia that had assembled in the bull-ring near Marshal Serrano's house to assist the anti-democratic movement were disarmed, and their leaders, the politicians and generals, were allowed to escape to France or Portugal. The Cortes were dissolved, and the federal and constituent Cortes of the republic convened, but they only sat during the summer of 1873, long enough to show their absolute incapacity, and to convince the executive that the safest policy was to suspend the session for several months.

This was the darkest period of the annals of the Spanish revolution of 1873-1874. Matters got to such a climax of disorder, disturbance and confusion, from the highest to the lowest strata of Spanish society, that the president of the executive, Figueras, deserted his post and fled the country. Pi y Margall and Salmeron, in successive attempts to govern, found no support in the really important and influential elements of Spanish society. Salmeron had even to appeal to such well-known reactionary generals as Pavia, Sanchez, Bregna and Moriones, to assume the command of the armies in the south and in the north of Spain. Fortunately these officers responded to the call of the executive. In less than five weeks a few thousand men properly handled sufficed to quell the cantonal risings in Cordoba, Sevilla, Cadiz and Malaga, and the whole of the south might have been soon pacified, if the federal republican ministers had not once more given way to the pressure of the majority of the Cortes, composed of "Intransigentes" and radical republicans. The president, Salmeron, after showing much indecision, resigned, but not until he had recalled the general in command in Andalusia, Pavia. This resignation was not an unfortunate event for the country, as the

federal Cortes not only made Castelar chief of the executive, though his partisans were in a minority in the Parliament, but they gave him much liberty to act, as they decided to suspend the sittings of the house until 2nd January 1874. This was the turning-point of the Spanish revolution, as from that day the tide set in towards the successive developments that led to the restoration of the Bourbons.

On becoming the ruler of Spain at the beginning of September 1873, Castelar at once devoted his attention to the reorganization of the army, whose numbers had dwindled down to about 70,000 men. This force, though aided by considerable bodies of local militia and volunteers in the northern and western provinces, was insufficient to cope with the 60,000 Carlists in arms, and with the still formidable nucleus of cantonalists around Alcoy and Cartagena. To supply the deficiencies Castelar called out more than 100,000 conscripts, who joined the colours in less than six weeks. He selected his generals without respect of politics, sending Moriones to the Basque provinces and Navarre at the head of 20,000 men, Martinez Campos to Catalonia with several thousand, and Lopez Dominguez, the nephew of Marshal Serrano, to begin the land blockade of the last stronghold of the cantonal insurgents, Cartagena, where the crews of Spain's only fleet had joined the revolt.

Castelar next turned his attention to the Church. He renewed direct relations with the Vatican, and at last induced Pope Pius IX. to approve his selection of two dignitaries to occupy vacant sees as well as his nominee for the vacant archbishopric of Valencia, a prelate who afterwards became archbishop of Toledo, and remained to the end a close friend of Castelar. He put a stop to all persecutions of the Church and religious orders, and enforced respect of Church property. He attempted to restore some order in the treasury and administration of finance, with a view to obtain ways and means to cover the expense of the three civil wars, Carlist, cantonal and Cuban. The Cuban insurgents gave him much trouble and anxiety, the famous *Virginius* incident nearly leading to a rupture between Spain and the United States. Castelar sent out to Cuba all the reinforcements he could spare, and a new governor-general, Jovellar, whom he peremptorily instructed to crush the mutinous spirit of the Cuban militia, and not allow them to drag Spain into a conflict with the United States. Acting upon the instructions of Castelar, Jovellar gave up the filibuster vessels, and those of the crew and passengers who had not been summarily shot by General Burriel. Castelar always prided himself on having terminated this incident without too much damage to the prestige of Spain.

At the end of 1873 Castelar had reason to be satisfied with the results of his efforts, with the military operations in the peninsula, with the assistance he was getting from the middle classes and even from many of the political elements of the Spanish revolution that were not republican. On the other hand, on the eve of the meeting of the federal Cortes, he could indulge in no illusions as to what he had to expect from the bulk of the republicans, who openly dissented from his conservative and conciliatory policy, and announced that they would reverse it on the very day the Cortes met. Warnings came in plenty, and no less a personage than the man he had made captain-general of Madrid, General Pavia, suggested that, if a conflict arose between Castelar and the majority of the Cortes, not only the garrison of Madrid and its chief, but all the armies in the field and their generals, were disposed to stand by the president. Castelar knew too well what such offers meant in the classic land of *pronunciamientos*, and he refused so flatly that Pavia did not renew his advice. The sequel is soon told. The Cortes met on the 2nd of January 1874. The intransigent majority refused to listen to a last eloquent appeal that Castelar made to their patriotism and common sense, and they passed a vote of censure. Castelar resigned. The Cortes went on wrangling for a day and night until, at daybreak on the 3rd of January 1874, General Pavia forcibly ejected the deputies, closed and dissolved the Cortes, and called up Marshal Serrano to form a provisional government.

Castelar kept apart from active politics during the twelve months that Serrano acted as president of the republic. Another *pronunciamiento* finally put an end to it in the last week of December 1874, when Generals Campos at Sagunto, Jovellar at Valencia, Primo de Rivera at Madrid, and Laserna at Logroño, proclaimed Alphonso XII. king of Spain. Castelar then went into voluntary exile for fifteen months, at the end of which he was elected deputy for Barcelona. He sat in all subsequent parliaments, and just a month before his death he was elected as representative of Murcia. During that period he became even more estranged from the majority of the republicans. Bitter experience had shown him that their federal doctrines and revolutionary methods could lead to nothing in harmony with the aspirations of the majority of Spaniards. He elected, to use his own words, to defend and to seek the realization of the substance of the programme of the Spanish revolution of 1868 by evolution, and legal, pacific means. Hence the contrast between his attitude from 1876 to 1886, during the reign of Alphonso XII., when he stood in the front rank of the Opposition to defend the

reforms of that revolution against Señor Canovas, and his attitude from 1886 to 1891. In this latter period Castelar acted as a sort of independent auxiliary of Sagasta and of the Liberal party. As soon as Castelar saw universal suffrage re-established he solemnly declared in the Cortes that his task was accomplished, his political mission at an end, and that he proposed to devote the remainder of his life to those literary, historical, philosophical, and economic studies which he had never neglected even in the busiest days of his political career. Indeed, it was his extraordinary activity and power of assimilation in such directions that allowed him 471
to keep his fellow-countrymen so well informed of what was going on in the outer world. His literary and journalistic labours occupied much of his time, and were his chief means of subsistence. He left unfinished a history of Europe in the 19th century. The most conspicuous of his earlier works were:—*A History of Civilization in the First Five Centuries of Christianity*, *Recollections of Italy*, *Life of Lord Byron*, *The History of the Republican Movement in Europe*, *The Redemption of Slaves*, *The Religious Revolution*, *Historical Essays on the Middle Ages*, *The Eastern Question*, *Fra Filippo Lippi*, *History of the Discovery of America*, and some historical novels. Castelar died near Murcia on the 25th of May 1899, at the age of 66. His funeral at Madrid was an imposing demonstration of the sympathy and respect of all classes and parties.

(A. E. H.)

CASTELFRANCO NELL' EMILIA, a town of Emilia, Italy, in the province of Bologna, 16 m. N.W. by rail from the town of Bologna. Pop. (1901) 3163 (town), 13,484 (commune). The churches contain some pictures by later Bolognese artists. Just outside the town is a massive fort erected by Urban VIII. in 1628, on the frontier of the province of Bologna, now used as a prison. Castelfranco either occupies or lies near the site of the ancient Forum Gallorum, a place on the Via Aemilia between Mutina and Bononia, where in 43 B.C. Octavian and Hirtius defeated Mark Antony.

CASTELFRANCO VENETO, a town and episcopal see of Venetia, Italy, in the province of Treviso, 16 m. W. by rail from the town of Treviso. Pop. (1901) 5220 (town), 12,551 (commune). The older part of the town is square, surrounded by medieval walls and towers constructed by the people of Treviso in 1218 (see CITTADELLA). It was the birthplace of the painter Giorgio Barbarelli (Il Giorgione, 1477-1512), and the cathedral contains one of his finest works, the Madonna with SS. Francis and Liberalis (1504), in the background of which the towers of the old town may be seen.

CASTELL, EDMUND (1606-1685), English orientalist, was born in 1606 at Tadlow, in Cambridgeshire. At the age of fifteen he entered Emmanuel College, Cambridge, but afterwards changed his residence to St John's, on account of the valuable library there. His great work was the compiling of his *Lexicon Heptaglotton Hebraicum, Chaldaicum, Syriacum, Samaritanum, Aethiopicum, Arabicum, et Persicum* (1669). Over this book he spent eighteen years, working (if we may accept his own statement) from sixteen to eighteen hours a day; he employed fourteen assistants, and by an expenditure of £12,000 brought himself to poverty, for his lexicon, though full of the most unusual learning, did not find purchasers. He was actually in prison in 1667 because he was unable to discharge his brother's debts, for which he had made himself liable. A volume of poems dedicated to the king brought him preferment. He was made prebendary of Canterbury and professor of Arabic at Cambridge. Before undertaking the *Lexicon Heptaglotton*, Castell had helped Dr Brian Walton in the preparation of his Polyglott Bible. His MSS. he bequeathed to the university of Cambridge. He died in 1685 at Higham Gobion, Bedfordshire, where he was rector.

The Syriac section of the *Lexicon* was issued separately at Göttingen in 1788 by J.D. Michaelis, who offers a tribute to Castell's learning and industry. Trier published the Hebrew section in 1790-1792.

CASTELLAMMARE DI STABIA (anc. *Stabiae*), a seaport and episcopal see of Campania, Italy, in the province of Naples, 17 m. S.E. by rail from the town of Naples. Pop. (1901) town, 26,378; commune, 32,589. It lies in the south-east angle of the Bay of Naples, at the beginning of the peninsula of Sorrento, and owing to the sea and mineral water baths (12 different springs) and its attractive situation, with a splendid view of Vesuvius and fine woods on the hills behind, it is a favourite resort of foreigners in spring and autumn and of Neapolitans in summer. The castle from which it takes its name, on the hill to the south of the town, was built by the emperor Frederick II. There are three large churches of the late 18th century. There are a large royal dockyard and a small-arms factory; there are also iron works, cotton, flour and macaroni mills. The value of imports (chiefly coal, wheat, scrap-iron and cheese) for 1904 was £1,239,048, and the value of exports (chiefly macaroni and green fruit) £769,100. There is also a sponge trade, but the former coral trade is depressed. The port was cleared by 420 vessels of 477,713 tonnage in 1905. An electric tramway along the coast road to Sorrento was opened in 1905.

CASTELLESI, ADRIANO (c. 1460?-c. 1521?), known also as Corneto from his birthplace, Italian cardinal and writer, was sent by Innocent VIII. to reconcile James III. of Scotland with his subjects. While in England he was appointed (1503), by Henry VII., to the see of Hereford, and in the following year to the more lucrative diocese of Bath and Wells, but he never resided in either. Returning to Rome, he became secretary to Alexander VI. and was made by him cardinal (May 31, 1503). A man of doubtful reputation, Alexander's confidant and favourite, he paid the pope a large sum for his elevation. He bought a *vigna* in the Borgo near the Vatican, and thereon erected a sumptuous palace after designs by Bramante; and it was here, in the summer of 1503, that he entertained the pope and Cesare Borgia at a banquet that went on till nightfall despite the unhealthy season of the year, when ague in its most malignant form was rife. Of the three, Cardinal Adrian was the first to fall ill, the pope succumbing a week after. The story of the poisoning of the pope is to be relegated to the realm of fiction. Soon after the election of Leo X. the cardinal was implicated in the conspiracy of Cardinal Petrucci against the pope, and confessed his guilt; but, pardon being offered only on condition of the payment o£ 25,000 ducats, he fled from Rome and was subsequently deposed from the cardinalate. As early as 1504 he had presented his palace (now the Palazzo Giraud-Torlonia) to Henry VII. as a residence for the English ambassador to the Holy See; and on his flight Henry VIII., who had quarrelled with him, gave it to Cardinal Campeggio. Adrian first fled to Venice. Of his subsequent history nothing is known for certain. It is said that he was murdered by a servant when on his way to the conclave that elected Adrian VI. As a writer, he was one of the first to restore the Latin tongue to its pristine purity; and among his works are *De Vera Philosophia ex quatuor doctoribus ecclesiae* (Bologna, 1507), *De Sermone Latino* (Basel, 1513), and a poem, *De Venatione* (Venice, 1534).

See Polydore Vergil, *Anglicae historiae*, edited by H. Ellis (London, 1844); and A. Aubéry, *Histoire générale des cardinaux* (Paris, 1642).

(E. Tn.)

CASTELLI, IGNAZ FRANZ (1781-1862), Austrian dramatist, was born at Vienna on the 6th of March 1781. He studied law at the university, and then entered the government service. During the Napoleonic invasions his patriotism inspired him to write stirring war

songs, one of which, *Kriegslied für die österreichische Armee*, was printed by order of the archduke Charles and distributed in thousands. For this Castelli was proclaimed by Napoleon in the *Moniteur*, and had to seek refuge in Hungary. In 1815 he accompanied the allies into France as secretary to Count Cavriani, and, after his return to Vienna, resumed his official post in connexion with the estates of Lower Austria. In 1842 he retired to his property at Lilienfeld, where, surrounded by his notable collections of pictures and other art treasures, he for the rest of his life devoted himself to literature. Castelli's dramatic talent was characteristically Austrian; his plays were well constructed and effective and satirized unsparingly the foibles of the Viennese. But his wit was too local and ephemeral to appeal to any but his own generation, and if he is remembered at all to-day it is by his excellent *Gedichte in niederösterreichischer Mundart* (1828). He died at Lilienfeld on the 5th of February 1862.

Castelli's *Gesammelte Gedichte* appeared in 1835 in 6 vols.; a selection of his *Werke* in 1843 in 15 vols. (2nd ed., 1848), followed by 6 supplementary volumes in 1858. His autobiography, *Memoiren meines Lebens*, appeared in 1861-1862 in 4 vols.

CASTELLO, BERNARDO (1557-1629), Genoese portrait and historical painter, born at Albaro near Genoa, was the intimate friend of Tasso, and took upon himself the task of designing the figures of the *Gerusalemme Liberata*, published in 1592; some of these subjects were engraved by Agostino Caracci. Besides painting a number of works in Genoa, mostly in a rapid and superficial style, Castello was employed in Rome and in the court of the duke of Savoy.

CASTELLO, GIOVANNI BATTISTA (1500?-1569?), Italian historical painter, was born near Bergamo in 1500 or perhaps 1509, and is hence ordinarily termed Il Bergamasco. He belongs, however, to the school of Genoa, but does not appear to have had any family relationship with the other two painters named Castello, also noticed here. He was employed to decorate the Nunziata di Portoria in Genoa, the saloon of the Lanzi Palace at Gorlago, and the Pardo Palace in Spain. His best-known works are the "Martyrdom of St Sebastian," and the picture of "Christ as Judge of the World" on one of the vaultings of the Annunziata. He was an architect and sculptor as well as painter. In 1567 he was invited to Madrid by Philip II., and there he died, holding the office of architect of the royal palaces. The date of death (as of birth) is differently stated as 1569 or 1579.

CASTELLO, VALERIO (1625-1659), Italian painter, was the youngest son of Bernardo Castello (*q.v.*). He surpassed his father, and particularly excelled in painting battle-scenes. He painted the "Rape of the Sabines," now in the Palazzo Brignole, Genoa, and decorated the cupola of the church of the Annunziata in the same city. In these works he is regarded by his admirers as combining the fire of Tintoretto with the general style of Paolo Veronese.

CASTELLO BRANCO, CAMILLO, Visconde de Correia Botelho (1825-1890), Portuguese novelist, was born out of wedlock and lost his parents in infancy. He spent his early years in a village in Traz-os-Montes. He learnt to love poetry from Camoens and Bocage, while Mendes Pinto gave him a lust for adventure, but he dreamed more than he read, and grew up

undisciplined and proud. He studied in Oporto and Coimbra with much irregularity, and since his disdain for the intrigues and miseries of politics in Portugal debarred him from the chance of a government post, he entered the career of letters to gain a livelihood. After a spell of journalistic work in Oporto and Lisbon he proceeded to the Episcopal seminary in the former city with a view of studying for the priesthood, and during this period wrote a number of religious works and translated Chateaubriand. He actually took minor orders, but his restless nature prevented him from following one course for long and he soon returned to the world, and henceforth kept up a feverish literary activity to the end. He was created a viscount in 1885 in recognition of his services to letters, and when his health finally broke down and he could no longer use his pen, parliament gave him a pension for life. When, having lost his sight, and suffering from chronic nervous disease, he died by his own hand in 1890, it was generally recognized that Portugal had lost the most national of her modern writers.

Apart from his plays and verses, Castello Branco's works may be divided into three sections. The first comprises his romances of the imagination, of which *Os mysterios de Lisboa*, in the style of Victor Hugo, is a fair example. The second includes his novels of manners, a style of which he was the creator and remained the chief exponent until the appearance of *O Crime de Padre Amaro* of Eça de Queiroz. In these he is partly idealist and partly realist, and describes to perfection the domestic and social life of Portugal in the early part of the 19th century. The third division embraces his writings in the domain of history, biography and literary criticism. Among these may be cited *Noites de Lamego*, *Cousas leves e pesadas*, *Cavar em ruinas*, *Memorias do Bispo do Grão Para* and *Bohemia do Espirito*.

In all, his publications number about two hundred and sixty, belonging to many departments of letters, but he owes his great and lasting reputation to his romances. Notwithstanding the fact that his slender means obliged him to produce very rapidly to the order of publishers, who only paid him from £30 to £60 a book, he never lost his individuality under the pressure. Knowing the life of the people by experience and not from books, he was able to fix in his pages a succession of strongly marked and national types, such as the *brazileiro*, the old *fidalgo* of the north, and the Minho priest, while his lack of personal acquaintance with foreign countries and his relative ignorance of their literatures preserved him from the temptation, so dangerous to a Portuguese, of imitating the classical writers of the larger nations. Among the most notable of his romances are *O Romance de un Homem Rico*, his favourite, *Retrato de Ricardina, Amor de Perdição*, and the magnificent series entitled *Novellas do Minho*. Many of his novels are autobiographical, like *Onde está a felicidade*, *Memorias do Carcere* and *Vingança*. Castello Branco is an admirable story-teller, largely because he was a brilliant improvisatore, but he does not attempt character study. Nothing can exceed the richness of his vocabulary, and no other Portuguese author has shown so profound a knowledge of the popular language. Though nature had endowed him with the poetic temperament, his verses are mediocre, but his best plays are cast in bold lines and contain really dramatic situations, while his comedies are a triumph of the grotesque, with a mordant vein running through them that recalls Gil Vicente.

The collected works of Camillo Castello Branco are published by the Companhia Editora of Lisbon, and his most esteemed books have had several editions. The *Diccionario Bibliographico Portuguez*, vol. ix. p. 7 et seq., contains a lengthy but incomplete list of his publications. See *Romance do Romancista*, by A. Pimentel, a badly put together but informing biography; also a study on the novelist by J. Pereira de Sampaio in *A Geração Nova* (Oporto, 1886); Dr Theophilo Braga, *As Modernas Ideias na litteratura Portugueza* (Oporto, 1892); Padre Senna Freitas, *Perfil de Camillo Castello Branco* (S. Paulo, 1887); and Paulo Osorio, *Camillo, a sua vida, o seu genio, a sua obra* (Oporto, 1908).

(E. Pr.)

CASTELLO BRANCO, an episcopal city and the capital of an administrative district formerly included in the province of Beira, Portugal; 1560 ft. above the sea, on the Abrantes-Guarda railway. Pop. (1900) 7288. Numerous Roman remains bear witness to the antiquity of Castello Branco, but its original name is unknown. The city is dominated by a ruined castle, and partly enclosed by ancient walls; its chief buildings are the cathedral and episcopal palace. Cloth is manufactured, and there is a flourishing local trade in cork, wine and olive oil. The administrative district of Castello Branco, which comprises the valleys of the Zezere, Ocreza and Ponsul, right-hand tributaries of the Tagus, coincides with the south-eastern part

of Beira; pop. (1900) 216,608; area, 2382 sq. m.

CASTELLÓN DE LA PLANA, a maritime province of eastern Spain, formed in 1833 of districts formerly included in Valencia, and bounded on the N. by Teruel and Tarragona, E. by the Mediterranean Sea, S. by Valencia, and W. by Teruel. Pop. (1900) 310,828; area, 2495 sq. m. The surface of the province is almost everywhere mountainous, and flat only near the coast and along some of the river valleys. Even on the coast the Atalayas de Alcalá and the Desierto de las Palmas form two well-defined though not lofty ridges. The Mijares or Millares is the principal river, flowing east-south-east from the highlands of Teruel, between the Sierras of Espina and Espadan towards the south, and the peak called Peña Golosa (5945 ft.) towards the north, until it reaches the sea a little south of the capital, also called Castellón de la Plana. The Monlleo, a left-hand tributary of the Mijares; the Bergantes, which flows inland to join the Guadalope in Teruel; the Cenia, which divides Castellón from Tarragona; and a variety of lesser streams, render the province abundantly fertile. No considerable inlet breaks the regularity of the coast-line, and there is no first-class harbour. The climate is cold and variable in the hilly districts, temperate in winter and very warm in summer in the lowlands. Agriculture, fruit-growing, and especially the cultivation of the vine and olive, employ the majority of the peasantry; stock-farming and sea-fishing are also of importance. Lead, zinc, iron and other ores have been discovered in the province; but in 1903, out of 129 mining concessions registered, only two were worked, and their output, lead and zinc, was quite insignificant. The local industries are mainly connected with fish-curing, paper, porcelain, woollens, cotton, silk, esparto, brandy and oils. Wine, oranges and oil are exported to foreign countries and other parts of Spain. The important Barcelona-Valencia railway skirts the coast, passing through the capital; and the Calatayúd-Sagunto line crosses the southern extremity of the province. Elsewhere the roads, which are generally indifferent, form the sole means of communication. Castellón (29,904), Villarreal (16,068), the port of Burriana (12,962), and Peñiscola (3142), a town of some historical interest, are described in separate articles. The other chief towns are Alcalá de Chisbert (6293), Almazora (7076), Benicarló (7251), Maella (7335), Onda (6595), Segorbe (7045), Vail de Uxó (8643), Villafamés (6708) and Vinaroz (8625).

CASTELLÓN DE LA PLANA, the capital of the province described above, on the Barcelona-Valencia railway, 4 m. from the Mediterranean Sea. Pop. (1900) 29,904. The broad and fertile plain in which Castellón is built is watered artificially by a Moorish aqueduct, largely cut through the solid rock, and supplied by the estuary of the Mijares, 5 m. south-east. The town is partly encircled by ancient walls; and, although most of its public buildings are modern, it contains several convents of early foundation, a curious old bell-tower, 150 ft. high, and a parish church chiefly noteworthy for a painting in the interior by Francisco Ribalta, who was born here in the middle of the 16th century. Castellón has a brisk trade, its manufactures comprising porcelain, leather, silk, linen, brandy and cork goods. Its harbour, El Gráo de Castellón, about 4 m. east, is annually entered by some 200 small vessels. A light railway, which traverses the numerous and profitable orange plantations on the south-west, connects it with the towns of Almazora, Villarreal, Burriana and Onda. Under its Moorish rulers Castellón occupied a hill to the north of its present site; its removal to the plain by James I. of Aragon (1213-1276) gave the town its full name, “Castellón of the Plain.”

CASTELNAU, MICHEL DE, Sieur de la Mauvissière (c. 1520-1592), French soldier and diplomatist, ambassador to Queen Elizabeth, was born in Touraine about 1520. He was one of a large family of children, and his grandfather, Pierre de Castelnau, was equerry to Louis XII. Endowed with a clear and penetrating intellect and remarkable strength of memory, he

received a careful education, to complete which he travelled in Italy and made a long stay at Rome. He then spent some time in Malta, afterwards entered the army, and made his first acquaintance with war in the campaigns of the French in Italy. His abilities and his courage won for him the friendship and protection of the cardinal of Lorraine, who took him into his service. In 1557 a command in the navy was given to him, and the cardinal proposed to get him knighted. This, however, he declined, and then rejoined the French army in Picardy. Various delicate missions requiring tact and discretion were entrusted to him by the constable de Montmorency, and these he discharged so satisfactorily that he was sent by the king, Henry II., to Scotland with despatches for Mary Stuart, then betrothed to the dauphin (afterwards Francis II.). From Scotland he passed into England, and treated with Queen Elizabeth respecting her claims on Calais (1559), a settlement of which was effected at the congress of Cateau-Cambrésis. He was next sent as ambassador to the princes of Germany, for the purpose of prevailing upon them to withdraw their favour from the Protestants. This embassy was followed by missions to Margaret of Parma, governess of the Netherlands, to Savoy, and then to Rome, to ascertain the views of Pope Paul IV. with regard to France. Paul having died just before his arrival, Castelnau used his influence in favour of the election of Pius IV. Returning to France, he once more entered the navy, and served under his former patron. It was his good fortune, at Nantes, to discover the earliest symptoms of the conspiracy of Amboise, which he immediately reported to the government.

After the death of Francis II. (December 1560) he accompanied the queen, Mary Stuart, to Scotland, and remained with her a year, during which time he made several journeys into England, and attempted to bring about a reconciliation between Mary and Queen Elizabeth. The wise and moderate counsels which he offered to the former were unheeded. In 1562, in consequence of the civil war in France, he returned there. He was employed against the Protestants in Brittany, was taken prisoner in an engagement with them and sent to Havre, but was soon after exchanged. In the midst of the excited passions of his countrymen, Castelnau, who was a sincere Catholic, maintained a wise self-control and moderation, and by his counsels rendered valuable service to the government. He served at the siege of Rouen, distinguished himself at the battle of Dreux, took Tancarville, and contributed in 1563 to the recapture of Havre from the English.

During the next ten years Castelnau was employed in various important missions:—first to Queen Elizabeth, to negotiate a peace; next to the duke of Alba, the new governor of the Netherlands. On this occasion he discovered the project formed by the prince of Condé and Admiral Coligny to seize and carry off the royal family at Monceaux (1567). After the battle of St Denis he was again sent to Germany to solicit aid against the Protestants; and on his return he was rewarded for his services with the post of governor of Saint-Dizier and a company of orderlies. At the head of his company he took part in the battles of Jarnac and Moncontour. In 1572 he was sent to England by Charles IX. to allay the excitement created by the massacre of St Bartholomew, and the same year he was sent to Germany and Switzerland. Two years later he was reappointed by Henry III. ambassador to Queen Elizabeth, and he remained at her court for ten years. During this period he used his influence to promote the marriage of the queen with the duke of Alençon, with a view especially to strengthen and maintain the alliance of the two countries. But Elizabeth made so many promises only to break them that at last he refused to accept them or communicate them to his government. On his return to France he found that his château of La Mauvissière had been destroyed in the civil war; and as he refused to recognize the authority of the League, the duke of Guise deprived him of the governorship of Saint-Dizier. He was thus brought almost to a state of destitution. But on the accession of Henry IV., the king, who knew his worth, and was confident that although he was a Catholic he might rely on his fidelity, gave him a command in the army, and entrusted him with various confidential missions.

Castelnau died at Joinville in 1592. His *Mémoires* rank very high among the original authorities for the period they cover, the eleven years between 1559 and 1570. They were written during his last embassy in England for the benefit of his son; and they possess the merits of clearness, veracity and impartiality. They were first printed in 1621; again, with additions by Le Laboureur, in 2 vols. folio, in 1659; and a third time, still further enlarged by Jean Godefroy, 3 vols. folio, in 1731. Castelnau translated into French the Latin work of Ramus, *On the Manners and Customs of the Ancient Gauls*. Various letters of his are preserved in the Cottonian and Harleian collections in the British Museum.

His grandson, Jacques de Castelnau (1620-1658), distinguished himself in the war against Austria and Spain during the ministries of Richelieu and Mazarin, and died marshal of France.

See Hubault, *Ambassade de Castelnau en Angleterre* (1856); *Relations politiques de la France ... avec l'Écosse au seizième siècle*, edited by J.B.A.T. Teulet (1862); and De la Ferrière, *Les Projets de mariage d'Elisabeth* (1883).

CASTELNAUDARY, a town of south-western France, capital of an arrondissement in the department of Aude, 22 m. W.N.W. of Carcassonne, on the Southern railway between that city and Toulouse. Pop. (1906) 6650. It is finely situated on an elevation in the midst of a fertile and well-cultivated plain; and its commercial facilities are greatly increased by the Canal du Midi, which widens out, as it passes the town, into an extensive basin surrounded with wharves and warehouses for the timber used in the upkeep of the canal. The principal buildings are the law court, the hôtel de ville, and the church of St Michel, dating from the 14th century; none of these offers any feature of unusual interest. There are a number of flour-mills, as well as manufactories of earthenware, tiles and blankets; an extensive trade is maintained in lime, gypsum, timber, grain, fruits, wine, wool, cattle and farm implements, and the building of canal boats forms an important industry. The public institutions include the sub-prefecture, tribunals of first instance and of commerce, a communal college and a farm school.

Castelnaudary probably represents the ancient town of *Sostomagus*, taken during the 5th century by the Visigoths, who, it is conjectured, rebuilt the town, calling it *Castrum Novum Arianorum*, whence the present name. Early in the 13th century the town was the scene of several struggles during the war against the Albigenses, between Simon IV., count of Montfort, and Raymond VI., count of Toulouse, and their supporters. In 1229 it was deprived of its ramparts, and after these had been rebuilt, it was captured and burned by the Black Prince in 1355, but again rebuilt in 1366. In 1632 it was the scene of a cavalry engagement in which the rebel Henry II., duke of Montmorency, was defeated and captured by the royal troops.

CASTELSARRASIN, a town of south-western France, capital of an arrondissement in the department of Tarn-et-Garonne, 12 m. W. of Montauban on the Southern railway. Pop. (1906) town, 3189; commune, 7496. Castelsarrasin, situated on the left bank of the lateral canal of the Garonne and about a mile from the right bank of that river, is surrounded by promenades occupying the site of the old fortifications. Its chief building is the brick-built church of St Sauveur, which dates from the 13th century. The administrative buildings are modern. The town has a sub-prefecture, a tribunal of first instance, and a communal college. The principal industrial establishment is the metal-foundry of Sainte-Marguerite, where copper, tin and other metals are worked; there are also flour-mills, saw-mills and dye-works. Trade is in cattle, agricultural produce, wine, baskets and game.

The name Castelsarrasin appears in the 13th century, when the village of Villelongue was replaced by the present bastide. Castrum Cerrucium, Castel-sur-Azine (from the neighbouring stream, Azine) and Castellum Sarracenum are suggested derivations, no one of which can be adopted with certainty.

CASTI, GIOVANNI BATTISTA (1721-1803), Italian poet, was born of humble parents at Montefiascone, in the states of the church, in 1721. He rose to the dignity of canon in the cathedral of his native place, but gave up his chance of church preferment to satisfy his gay and restless spirit by visiting most of the capitals of Europe. In 1782, on the death of Metastasio, he was appointed *Poeta Cesario*, or poet-laureate of Austria, in which capacity he applied himself with great success to the opera bouffe; but in 1796 he resigned this post, in order that he might not be hampered by political relations; and he spent the close of his life

as a private gentleman at Paris, where he died in 1803. Casti is best known as the author of the *Novelle galanti*, and of *Gli Animali parlanti*, a poetical allegory, over which he spent eight years (1794-1802), and which, notwithstanding its tedious length, excited so much interest that it was translated into French, German and Spanish, and (very freely and with additions) into English, in W.S. Rose's *Court and Parliament of Beasts* (Lond., 1819). Written during the time of the Revolution in France, it was intended to exhibit the feelings and hopes of the people and the defects and absurdities of various political systems. The *Novelle Galanti* is a series of poetical tales, in the *ottava rima*—a metre largely used by Italian poets for that class of compositions. The sole merit of these poems consists in the harmony and purity of the style, and the liveliness and sarcastic power of many passages. They are, however, characterized by the grossest licentiousness; and there is no originality of plot—that, according to the custom of Italian novelists, being taken from classical mythology or other ancient legends. Among the other works of Casti is the *Poema Tartaro*, a mock-heroic satire on the court of Catherine II., with which he was personally acquainted.

CASTIGLIONE, BALDASSARE (1478-1529), Italian diplomatist and man of letters, was born at Casanatico near Mantua, and was educated at Milan under the famous professors Merula and Chalcondyles. In 1496 he entered the service of Lodovico Sforza, duke of Milan, returning to Mantua in 1500 when Lodovico was carried prisoner into France. In 1504 he was attached to the court of Guidobaldo Malatesta, duke of Urbino, and in 1506 he was sent by that prince on a mission to Henry VII. of England, who had before conferred on Federigo Malatesta, "the Good Duke," the most famous mercenary of his age, the order of the Garter. Guidobaldo dying childless in 1508, the duchy of Urbino was given to Francesco Maria della Rovere, for whom Castiglione, envoy at the court of Leo X. (Medici), obtained the office of generalissimo of the Papal troops. Charged with the arrangement of the dispute between Clement VII. (Medici) and Charles V., Castiglione crossed, in 1524, into Spain, where he was received with highest honours, being afterwards naturalized, and made bishop of Avila. In 1527, however, Rome was seized and sacked by the Imperialists under Bourbon, and in July of the same year the surrender of the castle of Sant' Angelo placed Clement in their hands. Castiglione had been tricked by the emperor, but there were not wanting accusations of treachery against himself. He had, however, placed fidelity highest among the virtues of his ideal "courtier," and when he died at Toledo in 1529 it was said that he had died of grief and shame at the imputation. The emperor mourned him as "one of the world's best cavaliers." A portrait of him, now at the Louvre, was painted by Raphael, who disdained neither his opinion nor his advice.

Castiglione wrote little, but that little is of rare merit. His verses, in Latin and Italian, are elegant in the extreme; his letters (Padua, 1769-1771) are full of grace and finesse. But the book by which he is best remembered is the famous treatise, *Il Cortegiano*, written in 1514, published at Venice by Aldus in 1528, and translated into English by Thomas Hoby as early as 1561. This book, called by the Italians *Il Libra d'oro*, and remarkable for its easy force and undemonstrative elegance of style no less than for the nobility and manliness of its theories (see the edition by V. Cian, Florence, 1894), describes the Italian gentleman of the Renaissance under his brightest and fairest aspect, and gives a charming picture of the court of Guidobaldo da Montefeltre, duke of Urbino, "confessedly the purest and most elevated court in Italy." In the form of a discussion held in the duchess's drawing-room—with Elizabetta Gonzaga, Pietro Bembo, Bernardo Bibbiena, Giuliano de' Medici, Emilia Pia, and Ceretino the Unique among the speakers—the question, What constitutes a perfect courtier? is debated. With but few differences, the type determined on is the ideal gentleman of the present day.

See P.L. Ginguené, *Histoire littéraire de l'Italie*, vi., vii.; J.A. Symonds, *The Renaissance in Italy* (London, 1875); C. Hare, *Courts and Camps of the Italian Renaissance* (1908); Julia Cartwright, *B. Castiglione, the Perfect Courtier* (1908), with good bibliography.

CASTIGLIONE, CARLO OTTAVIO, Count (1784-1849), Italian philologist, was born at

Milan of an ancient family. His principal work was done in connexion with the Arabic and other Oriental languages, but he also performed good service in several other departments. In 1819 he published *Monete cufiche del Museo di Milano*, and assisted Cardinal Mai in his *Ulphilae partium ineditarum in Ambrosianis palimpsestis repertarum editio*. A learned *Mémoire géographique et numismatique sur la partie orientale de la Barbarie appelée Afrikia par les Arabes* appeared in 1826, and established his reputation. In 1829 he published by himself the Gothic version of the second epistle of Paul to the Corinthians; and this was followed by the Gothic version of the epistle to the Romans, the first epistle to the Corinthians, and the epistle to the Ephesians in 1834, by Galatians, Philippians, and 1 Thessalonians in 1835, and by 2 Thessalonians in 1839. He died at Genoa on the 10th of April 1849.

His *Life*, by Biondelli, appeared at Milan in 1856.

CASTIGLIONE, GIOVANNI BENEDETTO (1616-1670), called in Italy Il Grechetto, and in France Le Benédette, Italian painter of the Genoese school, was born in Genoa, and studied for some time under Vandyck. He painted portraits, historical pieces and landscapes, but chiefly excelled in fairs, markets and rural scenes with animals. Noah and the animals entering the Ark was a favourite subject of his. His paintings are to be found in Rome, Venice, Naples, Florence, and more especially Genoa and Mantua. He also executed a number of etchings, which are spirited, free and full of taste; “Diogenes searching for a Man” is one of the principal of these. The etchings are remarkable for light and shade, and have even earned for Castiglione the name of “a second Rembrandt.” The *Presepio* (Nativity of Jesus) in the church of San Luca, Genoa, ranks among his most celebrated paintings, and the Louvre contains eight characteristic examples. In his closing years he lived in Mantua, painting for the court; here he received his name of “Grechetto,” from the classic air of his pastorals, and here he died of gout in 1670. His brother Salvatore and his son Francesco excelled in the same subjects; and it is thought that many paintings which are ascribed to Benedetto are only copies after him, or perhaps originals by his son or brother.

CASTIGLIONE DELLE STIVIERE, a town of Lombardy, Italy, in the province of Mantua, 20 m. N.W. of Mantua by road. Pop. (1901) 4122 (town), 5940 (commune). It has an old castle, much altered and restored, especially by the Gonzaga family of Mantua in the 16th century. During the War of the Spanish Succession, the French under the duke of Vendôme occupied it; and during the siege of Mantua in 1796, the Austrians under Würmser were defeated here by the French under Augereau, who was later created by Napoleon duke of Castiglione.

CASTIGLIONE OLONA, a town of Lombardy, Italy, in the province of Como, 27 m. N.E. of Milan by rail. Pop. (1901) 1806. The choir of the collegiate church, erected about 1428 by Cardinal Branda Castiglione, contains fine frescoes by Masolino of Florence: there are other works by the same master in the baptistery. The tomb of the cardinal (1443) is good. The church of S. Sepolcro, in the lower part of the town, has two large stone figures of saints on its façade (of the end of the 13th century) and, within, painted wooden figures and the tomb of Guido Castiglione (d. 1485) with fine sculptures of the school of Amadeo. The palace erected by Cardinal Castiglione has good terra-cotta decorations.

CASTILE, or Castille (*Castilla*), an ancient kingdom of Spain, occupying the central districts of the Iberian Peninsula; and bounded on the N. by the Bay of Biscay, N.E. by the Basque Provinces and Navarre, E. by Aragon, S.E. by Valencia and Murcia, S. by Andalusia, W. by Estremadura and Leon, and N.W. by Asturias. Pop. (1900) 3,708,713; area, 55,307 sq. m. The name *Castile* is commonly said to be derived from the numerous frontier forts (*castillos*) erected in the middle ages as a defence against the Moors. The northern part of the kingdom, which was first freed from Moorish rule, is called Old Castile (*Castilla la Vieja*); the southern, acquired later, is called New Castile (*Castilla la Nueva*). These two divisions, with a third known as North Castile, now rank as military districts or captaincies-general; but the term "North Castile," which covers the northern extremity of Old Castile, is not generally used. In 1833 Old Castile was divided into the provinces of Ávila, Burgos, Logroño, Palencia, Santander, Segovia, Soria and Valladolid; while New Castile was similarly divided into Ciudad Real, Cuenca, Guadalajara, Madrid and Toledo. The modern progress of commerce, communications, &c. in these thirteen provinces is described in the separate articles upon each of them.

Castile extends for about 300 m. from north to south, and 160 m. from east to west. It consists of a vast central plateau, with an average altitude of about 2500 ft. This plateau has a natural frontier of high mountains on all sides, except on the borders of Leon and Murcia; it is also bisected by the Sierra de Guadarrama and Sierra de Grédos, which extend in a south-westerly direction across the central districts, and form the dividing line between Old and New Castile. Geographically it includes also the high plains of Leon, towards the north-west, and of Murcia on the south-east. The existing frontier is marked on the north by the Cantabrian Mountains (*q.v.*); on the east by the Sierra de la Demanda with its offshoots, and by the Serrania de Cuenca; on the south by the Sierra Morena; and on the west by various minor ranges which link together the three more or less parallel chains of the Sierra de Grédos, Sierra de Guadalupe and Sierra Morena. Three great rivers, the Douro, which traverses Old Castile, with the Tagus and Guadiana, which respectively drain the central and southern regions of New Castile, flow westward into Portugal, and finally reach the Atlantic; while the Ebro, which rises in the north of the kingdom, skirts the north-eastern frontier on its way to the Mediterranean. These rivers are described under their own names.

The climate of Old Castile is healthy, but liable to severe cold and heat. Snow falls early and lies late in the mountains, and there is a heavy rainfall in the north-west. New Castile has a still more rigorous climate, for although the mean annual temperature is about 59° Fahr., the summer heat in the valleys is peculiarly oppressive, and the highlands are swept by scorching or icy gales, laden with dust. The rainfall rarely exceeds 10 in. in a year.

In both the Castiles the central plateau has a naturally fertile soil, for after rain a luxuriant vegetation appears; but drought is common, owing to the insufficient volume of the rivers, and the failure of the Spaniards to extend the fine system of irrigation which the Moors originated. Certain districts, indeed, in which a layer of heavy loam underlies the porous and friable surface, are able to retain the moisture which elsewhere is absorbed. Such land is found in Palencia, and in the Mesa de Ocaña, where it yields abundant crops; and many of the northern mountains are well wooded. But vast tracts of land are useless except as pasture for sheep, and even the sheep are driven by the severe winters to migrate yearly into Estremadura (*q.v.*). The normal Castilian landscape is an arid and sterile steppe, with scarcely a tree or spring of water; and many even of the villages afford no relief to the eye, for they are built of sunburnt unbaked bricks, which share the dusty brownish-grey tint of the soil. Especially characteristic is the great plain of La Mancha (*q.v.*).

The transformation of Castile from a small county in the north of what is now Old Castile into an independent monarchy, was one of the decisive events in the reconquest of Spain from the Moors. The successful resistance offered by Asturias to the invaders had been followed by the liberation of Galicia and Leon, when Ferdinand I. of Castile (1035-1065), by his marriage with Sancha, widow of the last king of Leon, was enabled to unite Leon and Castile in a single kingdom, with its capital at Burgos. New territories were annexed on the south, until, after the capture of Toledo in 1085, and the consequent formation of a New Castile, the kingdom comprised the whole of central Spain. Thenceforward its history is inseparable from that of the whole country; and it is therefore described in full, together with the language and literature of Castile, under Spain (*q.v.*).

Castilian, which is the literary language of Spain, and with certain differences, of Spanish America, is spoken in Old and New Castile, Aragon, Estremadura, and the greater part of Leon; in Andalusia it is subject to various modifications of accent and pronunciation. As there is little, if any, difference of racial origin, character and physical type, among the inhabitants of this region, except in Andalusia, and, to a less extent, in Estremadura, the Castilian is

justly regarded as the typical Spaniard. Among the Castilian peasantry, where education and foreign influence have never penetrated deeply, the national character can best be studied. Its intense pride, its fatalistic indolence and ignorance, its honesty and its bigotry, tempered by a keen sense of humour, are well-known characteristics. Apart from the peasant class, Castilians have contributed more to the development of Spanish art and literature than the inhabitants of any other region except, perhaps, Andalusia, which claims to be regarded as supreme in architecture and painting. Of the two great Spanish universities, Alcalá de Henares belonged in all respects to Castile, and Salamanca rose to equality with Paris, Oxford or Bologna, under the purely Castilian influence of Alphonso X. (1252-1284).

For a general description of Castile and its inhabitants, antiquities, commerce, &c., see *Castillo la Nueva*, three illustrated volumes in the series *España*, by J.M. Quadrado and V. de la Fuente (Barcelona, 1885-1886), and the *Guia del antiguo reino de Castilla*, by E. Valverde y Alvarez (Madrid, 1886), which deals with the provinces of Burgos, Santander, Logroño, Soria, Ávila and Segovia. For the history, see in addition to the works cited under SPAIN (section *History*), *Cronicas de los reyes de Castilla*, by C. Rosell (Madrid, 1875-1877, 2 vols.); *Coleccion de las cronicas y memorias de los reyes de Castilla* (Madrid, 1779-1787, 7 vols.); and *Historia de las communidades de Castilla* (Madrid, 1897).

CASTILHO, ANTONIO FELICIANO DE (1800-1875), Portuguese man of letters, was born at Lisbon. He lost his sight at the age of six, but the devotion of his brother Augusto, aided by a retentive memory, enabled him to go through his school and university course with success; and he acquired an almost complete mastery of the Latin language and literature. His first work of importance, the *Cartas de Echo e Narciso* (1821), belongs to the pseudo-classical school in which he had been brought up, but his romantic leanings became apparent in the *Primavera* (1822) and in *Amor e Melancholia* (1823), two volumes of honeyed and prolix bucolic poetry. In the poetic legends *A noite de Castello* (1836) and *Cuimes do bardo* (1838) Castilho appeared as a full-blown Romanticist. These books exhibit the defects and qualities of all his work, in which lack of ideas and of creative imagination and an atmosphere of artificiality are ill compensated for by a certain emotional charm, great purity of diction and melodious versification. Belonging to the didactic and descriptive school, Castilho saw nature as all sweetness, pleasure and beauty, and he lived in a dreamland of his imagination. A fulsome epic on the succession of King John VI. brought him an office of profit at Coimbra. On his return from a stay in Madeira, he founded the *Revista Universal Lisbonense*, in imitation of Herculano's *Panorama*, and his profound knowledge of the Portuguese classics served him well in the introduction and notes to a very useful publication, the *Livraria Classica Portugueza* (1845-1847, 25 vols.), while two years later he established the "Society of the Friends of Letters and the Arts." A study on Camoens and treatises on metrification and mnemonics followed from his pen. His praiseworthy zeal for popular instruction led him to take up the study of pedagogy, and in 1850 he brought out his *Leitura Repentina*, a method of reading which was named after him, and he became government commissary of the schools which were destined to put it into practice. Going to Brazil in 1854, he there wrote his famous "Letter to the Empress." Though Castilho's lack of strong individuality and his over-great respect for authority prevented him from achieving original work of real merit, yet his translations of Anacreon, Ovid and Virgil and the *Chave do Enigma*, explaining the romantic incidents that led to his first marriage with D. Maria de Baena, a niece of the satirical poet Tolentino, and a descendant of Antonio Ferreira, reveal him as a master of form and a purist in language. His versions of Goethe's *Faust* and Shakespeare's *Midsummer Night's Dream*, made without a knowledge of German and English, scarcely added to his reputation. When the Coimbra question arose in 1865, Garrett was dead and Herculano had ceased to write, leaving Castilho supreme, for the moment, in the realm of letters. But the youthful Anthero de Quental withstood his claim to direct the rising generation and attacked his superannuated leadership, and after a fierce war of pamphlets Castilho was dethroned. The rise of João de Deus reduced him to a secondary position in the Portuguese Parnassus, and when he died ten years later much of his former fame had preceded him to the tomb.

See also "Memorias de Castilho" in the *Instituto* of Coimbra; Innocencio da Silva in *Diccionario bibliographico Portuguez*, i. 130 and viii. 132: Latino Coelho's study in the *Revista contemporanea de Portugal e Brazil*, vols. i. and ii.; Dr Theophilo Braga, *Historia do Romantismo* (Lisbon, 1880).

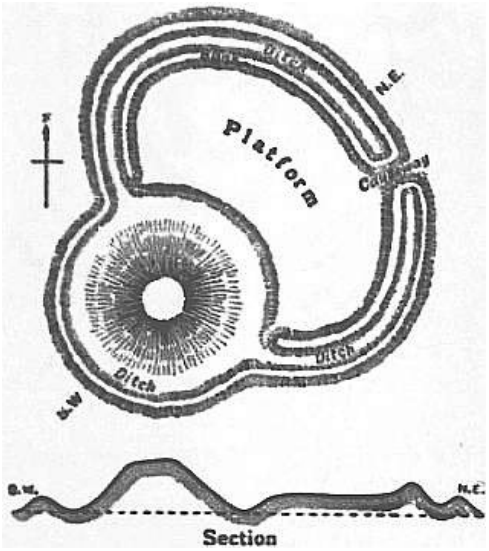
(E. PR.)

CASTILLEJO, CRISTÓBAL DE (1490-1556), Spanish poet, was born at Ciudad Rodrigo in 1490. In 1518 he left Spain with Ferdinand of Austria, afterwards emperor, whose private secretary he eventually became. While residing at Vienna in 1528-1530 he wrote the *Historia de Píramo y Tisbe*, and dedicated it to Anna von Schaumberg, with whom he had a platonic love-affair. He seems to have visited Venice, to have been neglected by his patron, to have fallen ill in 1540, and to have passed his last years in poverty. He died on the 12th of June 1556, and was buried at Vienna. Castillejo's poems are interesting, not merely because of their intrinsic excellence, but also as being the most powerful protest against the metrical innovations imported from Italy by Boscán and Garcilaso de la Vega. He adheres to the native *quintillas* or to the *coplas de pie quebrado*, and only abandons these traditional forms when he indulges in caustic parody of the new school—as in the lines *Contra los que dejan los metros castellanos*. He excels by virtue of his charming simplicity and his ingenious wit, always keen, sometimes licentious, never brutal. The urbane gaiety of his occasional poems is delightfully spontaneous, and the cynical humour which informs the *Diálogo de las condiciones de las mujeres* and the *Diálogo de la vida de la corte* is impregnated with the Renaissance spirit. Castillejo is the Clément Marot of Spain. His plays are lost; the best text of his verses is that printed at Madrid in 1792.

CASTILLO SOLÓRZANO, ALONSO DE (1584?-1647?), Spanish novelist and playwright, is stated to have been baptized at Tordesillas near Valladolid on 1st October 1584. Nothing is known of his youth, and he is next heard of at Madrid in 1619 as a man of literary tastes. While in the service of the marquis de Villar, he issued his first work, *Donaires del Parnaso* (1624-1625), two volumes of humorous poems; his *Tardes entretenidas* (1625) and *Jornadas alegres* (1626) proved that he was a novelist by vocation. Shortly afterwards he joined the household of the marquis de los Vélez, viceroy of Valencia, and published in quick succession three clever picaresque novels: *La Niña de los embustes, Teresa de Manzanares* (1634), *Las Aventuras del Bachiller Trapaza* (1637), and a continuation entitled *La Garduña de Sevilla y Anzuelo de las bolsas* (1642). To these shrewd cynical stories he owes his reputation. He followed the marquis de los Vélez in his disastrous campaign in Catalonia, and accompanied him to Rome, where the defeated general was sent as ambassador. Castillo Solórzano's death occurred (probably at Palermo) before 1648, but the exact date is uncertain. His prolonged absence from Madrid prevented him from writing as copiously for the stage as he would otherwise have done; but he was popular as a playwright both at home and abroad. His *Marqués del Cigarral* and *El Mayorazgo figurón* are the sources respectively of Scarron's *Don Jophet d'Arménie* and *L'Héritier ridicule*. Among his numerous remaining works may be mentioned *Las Harpías en Madrid* (1633), *Fiestas del Jardín* (1634), *Los Alivios de Casandra* (1640) and the posthumous *Quinta de Laurel* (1649); the witty observation of these books forms a singular contrast to the prim devotion of his *Sagrario de Valencia* (1635). His versatility and graceful style deserve the highest praise.

(J. F.-K.)

CASTLE (Lat. *castellum*, a fort, diminutive of *castra*, a camp; Fr. *château* and *châtel*), a small self-contained fortress, usually of the middle ages, though the term is sometimes used of prehistoric earthworks (*e.g.* Hollingbury Castle, Maiden Castle), and sometimes of citadels (*e.g.* the castles of Badajoz and Burgos) and small detached *forts d'arrêt* in modern times. It is also often applied to the principal mansion of a prince or nobleman, and in France (as *château*) to any country seat, this use being a relic of the feudal age. Under its twofold aspect of a fortress and a residence, the medieval castle is inseparably connected with the subjects of fortification (see Fortification and Siegecraft) and architecture (*q.v.*). An account of Roman and pre-Roman *castella* in Britain will be found under Britain.



From Clark's *Medieval Military Architecture*, by permission of Bernard Quaritch.
FIG. 1.—Plan of Laughton en-le-Morthen.

The word "castle" (*castel*) was introduced into English shortly before the Norman Conquest to denote a type of fortress, then new to the country, brought in by the Norman knights whom Edward the Confessor had sent for to defend Herefordshire against the inroads of the Welsh. Richard's castle, of which the earthworks remain and which has given its name to a parish, was erected at this period on the border of Herefordshire and Shropshire by Richard Fitz Scrob. The essential feature of this type was a circular mound of earth surrounded by a dry ditch and flattened at the top. Around the crest of its summit was placed a timber palisade. This moated mound was styled in French *motte* (latinized *mota*), a word still common in French place-names. It is clearly depicted at the time of the Conquest in the Bayeux tapestry, and was then familiar on the mainland of western Europe. A description of this earlier castle is given in the life of John, bishop of Terouanne (*Acta Sanctorum*, quoted by G.T. Clark, *Medieval Mil. Architecture*): —"The rich and the noble of that region being much given to feuds and bloodshed, fortify themselves ... and by these strongholds subdue their equals and oppress their inferiors. They heap up a mound as high as they are able, and dig round it as broad a ditch as they can.... Round the summit of the mound they construct a palisade of timber to act as a wall.... Inside the palisade they erect a house, or rather a citadel, which looks down on the whole neighbourhood." St John, bishop of Terouanne, died in 1130, and this castle of Merchem, built by "a lord of the town many years before" may be taken as typical of the practice of the 11th century. But in addition to the mound, the citadel of the fortress, there was usually appended to it a bailey or basecourt (and sometimes two) of semilunar or horseshoe shape, so that the mound stood *à cheval* on the line of the enceinte. The rapidity and ease with which it was possible to construct castles of this type made them characteristic of the Conquest period in England and of the Anglo-Norman settlements in Wales, Ireland and the Scottish lowlands. In later days a stone wall replaced the timber palisade and produced what is known as the shell-keep, the type met with in the extant castles of Berkeley, Alnwick and Windsor.

But the Normans introduced also two other types of castle. The one was adopted where they found a natural rock stronghold which only needed adaptation, as at Clifford, Ludlow, the Peak and Exeter, to produce a citadel; the other was a type wholly distinct, the high rectangular tower of masonry, of which the Tower of London is the best-known example, though that of Colchester was probably constructed in the 11th century also. But the latter type belongs rather to the more settled conditions of the 12th century when haste was not a necessity, and in the first half of which the fine extant keeps of Hedingham and Rochester were erected. These towers were originally surrounded by palisades, usually on earthen ramparts, which were replaced later by stone walls. The whole fortress thus formed was styled a castle, but sometimes more precisely "tower and castle," the former being the citadel, and the latter the walled enclosure, which preserved more strictly the meaning of the Roman *castellum*.

Reliance was placed by the engineers of that time simply and solely on the inherent strength of the structure, the walls of which defied the battering-ram, and could only be undermined at the cost of much time and labour, while the narrow apertures were constructed to exclude arrows or flaming brands.

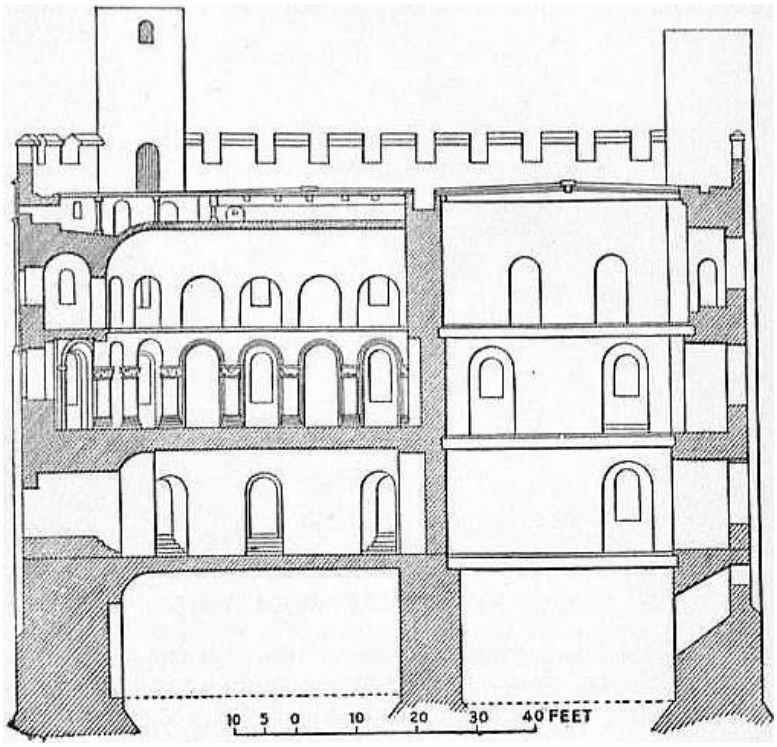
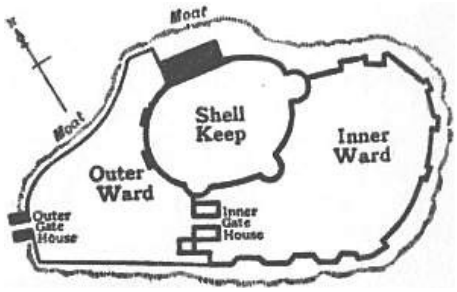
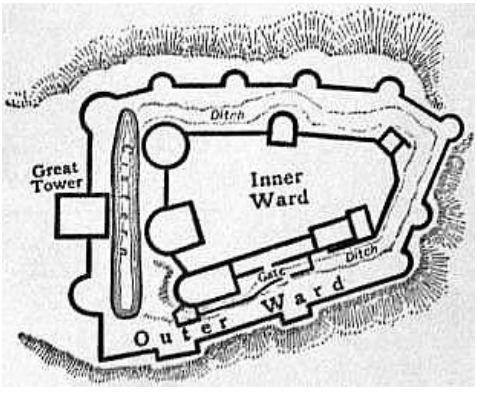


FIG. 2.—Vertical section of rectangular Norman Keep (Tower of London).

At this stage the crusades, and the consequent opportunities afforded to western engineers of studying the solid fortresses of the Byzantine empire, revolutionized the art of castle-building, which henceforward follows recognized principles. Many castles were built in the Holy Land by the crusaders of the 12th century, and it has been shown (Oman, *Art of War: the Middle Ages*, p. 529) that the designers realized, first, that a second line of defences should be built within the main enceinte, and a third line or keep inside the second line; and secondly, that a wall must be flanked by projecting towers. From the Byzantine engineers, through the crusaders, we derive, therefore, the cardinal principle of the mutual defence of all the parts of a fortress. The *donjon* of western Europe was regarded as the fortress, the outer walls as accessory defences; in the East each envelope was a fortress in itself, and the keep became merely the last refuge of the garrison, used only when all else had been captured. Indeed the keep, in several crusader castles, is no more than a tower, larger than the rest, built into the enceinte and serving with the rest for its flanking defence, while the fortress was made strongest on the most exposed front. The idea of the flanking towers (which were of a type very different from the slight projections of the shell-keep and rectangular tower) soon penetrated to Europe, and Alnwick Castle (1140-1150) shows the influence of the new system. But the finest of all castles of the middle ages was Richard Coeur de Lion's fortress of Château Gaillard (1197) on the Seine near Les Andelys. Here the innermost ward was protected by an elaborate system of strong appended defences, which included a strong *tête-de-pont* covering the Seine bridge (see Clark, i. 384, and Oman, p. 533). The castle stood upon high ground and consisted of three distinct enceintes or wards besides the keep, which was in this case merely a strong tower forming part of the innermost ward. The donjon was rarely defended *à outrance*, and it gradually sank in importance as the outer "wards" grew stronger. Round instead of rectangular towers were now becoming usual, the finest examples of their employment as keeps being at Conisborough in England and at Coucy in France. Against the relatively feeble siege artillery of the 13th century a well-built fortress was almost proof, but the mines and the battering ram of the attack were more formidable, and it was realized that corners in the stonework of



From Oman's *History of the Art of War*, by permission of Methuen & Co.
FIG. 3.—Berkeley Castle, late Norman Shell-Keep.



From Oman's *History of the Art of War*.
FIG. 4.—Krak-des-Chevaliers: Plan.

the fortress were more vulnerable than a uniform curved surface. Château Gaillard fell to Philip Augustus in 1204 after a strenuous defence, and the success of the assailants was largely due to the wise and skilful employment of mines. An angle of the noble keep of Rochester was undermined and brought down by John in 1215.

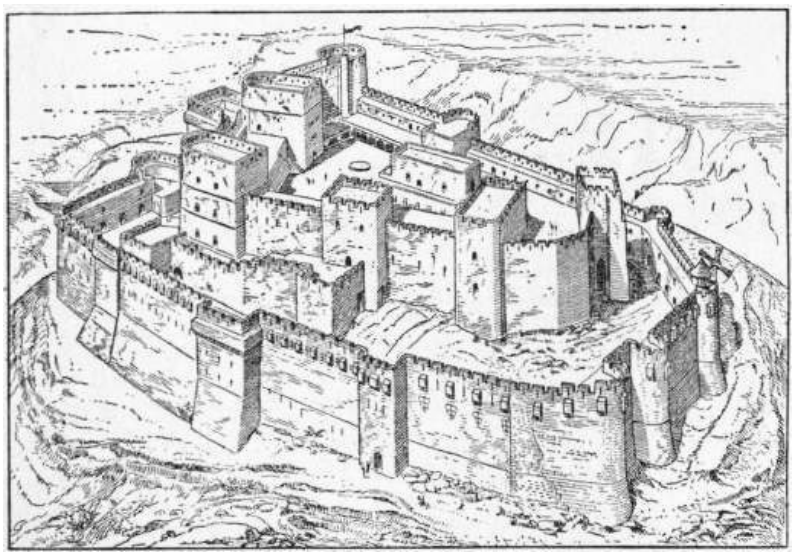


FIG. 5.—Krak-des-Chevaliers: View.

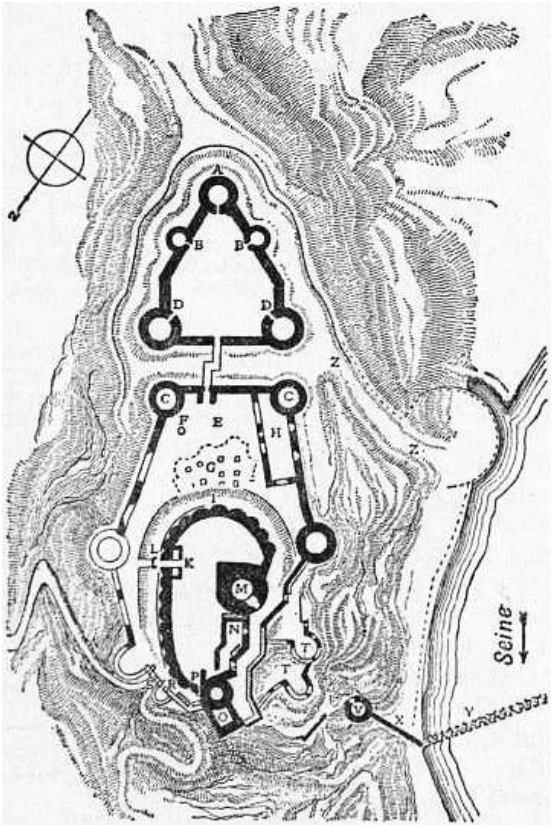


FIG. 6.—Château Gaillard.

A. *High Angle Tower*
B.B. *Smaller Side Towers*
C.C. D.D. *Corner Towers*
E. *Outer Enceinte, or Lower Court*
F. *The Well*
G.H. *Buildings in the Lower Court*
I. *The Moat*
K. *Entrance Gate*
L. *The Counterscarp*
M. *The Keep*
N. *The Escarpment*
O. *Postern Tower*
P. *Postern Gate*
R.R. *Parapet Walls*
S. *Gate from the Escarpment*
T.T. *Flanking Towers*
V. *Outer Tower*
X. *Connecting Wall*
Y. *The Stockade in the River*
Z.Z. *The Great Ditches*

The next development was the extension of the principle of successive lines of defence to form what is called the “concentric” castle, in which each ward was placed wholly within another which enveloped it; places thus built on a flat side (*e.g.* Caerphilly Castle) became for the first time more formidable than strongholds perched upon rocks

and hills such as Château Gaillard, where the more exposed parts indeed possessed many successive lines of defence, but at other points, for want of room, it was impossible to build more than one or, at most, two walls. In these cases, the fall of the inner ward by surprise, escalade, *vive force*, or even by regular siege (as was sometimes feasible), entailed the fall of the whole castle.

The adoption of the concentric system precluded any such mischance, and thus, even though siege-engines improved during the 13th and 14th centuries, the defence, by the massive strength of the concentric castle in some cases, by natural inaccessibility of position in others, maintained itself superior to the attack during the latter middle ages. Its final fall was due to the introduction of gunpowder as a propellant. “In the 14th century the change begins, in the 15th it is fully developed, in the 16th the feudal fastness has become an anachronism.”

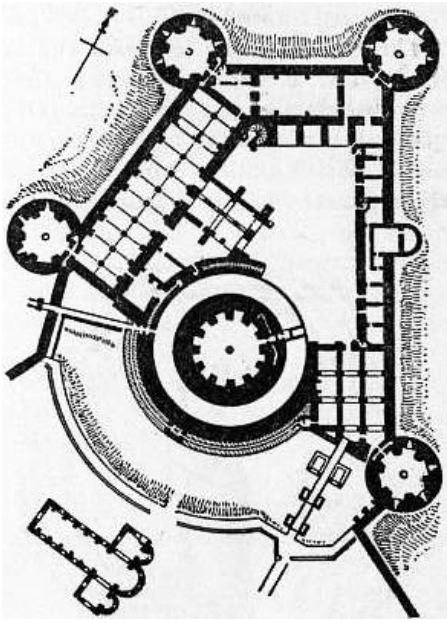
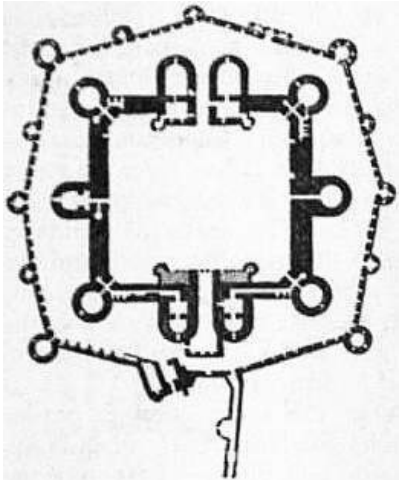


Fig. 7.—Coucy: Plan.

Fig. 8.—Coucy: View.

The general adoption of cannon placed in the hands of the central power a force which ruined the baronial fortifications in a few days of firing. The possessors of cannon were usually private individuals of the middle classes, from whom the prince hired the *matériel* and the technical workmen. A typical case will be found in the history of Brandenburg and Prussia (Carlyle, *Frederick the Great*, bk. iii. ch. i.), the impregnable castle of Friesack, held by an intractable feudal noble, Dietrich von Quitzow, being reduced in two days by the elector Frederick. I. with “Heavy Peg” (*Faule Grete*) and other guns hired and borrowed (February 1414). The beginnings of orderly government in Brandenburg thus depended upon the guns, and the taking of Friesack is, in Carlyle’s phrase, “a fact memorable to every Prussian man.” In England, the earl of Warwick in 1464 reduced the strong fortress of Bamborough in



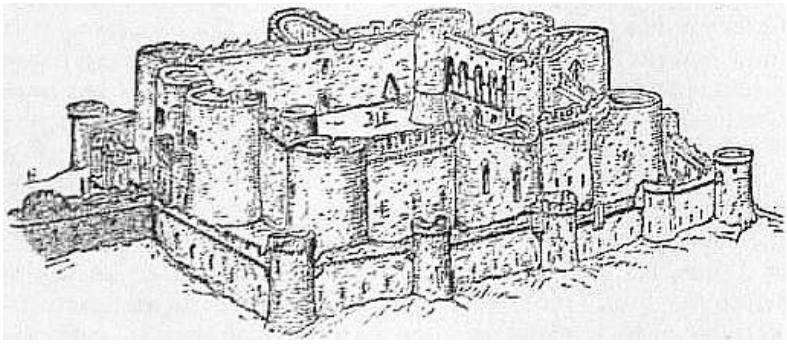
From Clark’s *Med. Mil. Arch.*

FIG. 9.—Beaumaris Castle: Plan.

a week, and in Germany, Franz von Sinkingen's stronghold of Landstuhl, formerly impregnable on its heights, was ruined in one day by the artillery of Philip of Hesse (1523). Very heavy artillery was used for such work, of course, and against lighter natures, some castles and even fortified country-houses or castellated mansions managed to make a stout stand even as late as the Great Rebellion in England.

The castle thus ceases to be the fortress of small and ill-governing local magnates, and its later history is merged in that of modern fortification. But an interesting transitional type between the medieval stronghold and the modern fortress is found in the coast castles erected by Henry VIII., especially those at Deal, Sandown and Walmer (c. 1540), which played some part in the events of the 17th century, and of which Walmer Castle is still the official residence of the lord warden of the Cinque Ports. Viollet-le-Duc, in his *Annals of a Fortress* (English trans.), gives a full and interesting account of the repeated renovations of the fortress on his imaginary site in the valley of the Doubs, the construction by Charles the Bold of artillery towers at the angles of the castle, the protection of the masonry by earthen outworks, boulevards and demi-boulevards, and, in the 17th century, the final service of the medieval walls and towers as a pure *enceinte de sûreté*. Here and there we find old castles serving as *forts d'arrêt* or block-houses in mountain passes and defiles, and in some few cases, as at Dover, they formed the nucleus of purely military places of arms, but normally the castle falls into ruins, becomes a peaceful mansion, or is merged in the fortifications of the town which has grown up around it. In the *Annals of a Fortress* the site of the feudal castle is occupied by the citadel of the walled town, for once again, with the development of the middle class and of commerce and industry, the art of the engineer came to be displayed chiefly in the fortification of cities. The baronial "castle" assumes *pari passu* the form of a mansion, retaining indeed for long some capacity for defence, but in the end losing all military characteristics save a few which survived as ornaments. Examples of such castellated mansions are seen in Wingfield Manor, Derbyshire, and Hurstmonceaux, Sussex, erected in the 15th century, and nearly all older castles which survived were continually improved and altered to serve as residences.

(C. F. A.)



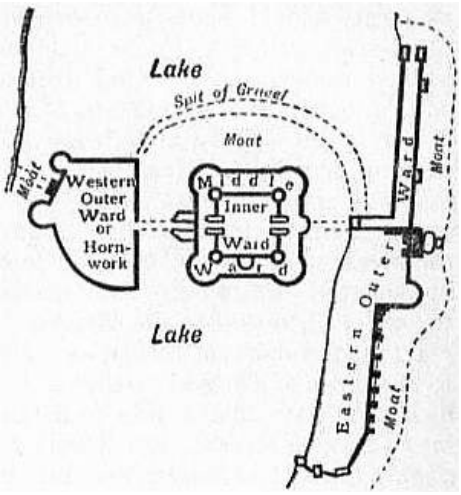
From Clark's *Med. Mil. Arch.*

FIG 10.—Beaumaris Castle—View.

Influence of Castles in English History.—Such strongholds as existed in England at the time of the Norman Conquest seem to have offered but little resistance to William the Norman, who, in order effectually to guard against invasions from without as well as to awe his newly-acquired subjects, immediately began to erect castles all over the kingdom, and likewise to repair and augment the old ones. Besides, as he had parcelled out the lands of the English amongst his followers, they, to protect themselves from the resentment of the despoiled natives, built strongholds and castles on their estates, and these were multiplied so rapidly during the troubled reign of King Stephen that the "adulterine" (*i.e.* unauthorized) castles are said by one writer to have amounted to 1115.

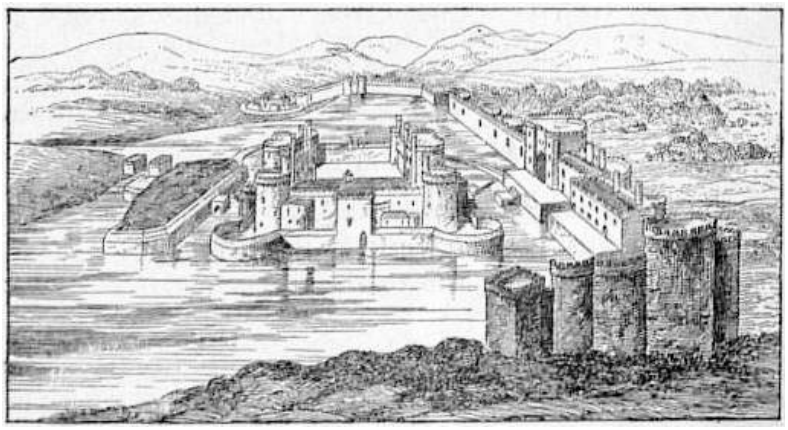
In the first instance, when the interest of the king and of his barons was identical, the former had only retained in his hands the castles in the chief towns of the shires, which were entrusted to his sheriffs or constables. But the great feudal revolts under the Conqueror and his sons showed how formidable an obstacle to the rule of the king was the existence of such fortresses in private hands, while the people hated them from the first for the oppressions connected with their erection and maintenance. It was, therefore, the settled

policy of the crown to strengthen the royal castles and increase their number, while jealously keeping in check those of the barons. But in the struggle between Stephen and the empress Maud for the crown, which became largely a war of sieges, the royal power was relaxed and there was an outburst of castle-building, without permission, by the barons. These in many cases acted as petty sovereigns, and such was their tyranny that the native chronicler describes the castles as “filled with devils and evil men.” These excesses paved the way for the pacification at the close of the reign, when it was provided that all unauthorized castles constructed during its course should be destroyed. Henry II., in spite of his power, was warned by the great revolt against him that he must still rely on castles, and the massive keeps of Newcastle and of Dover date from this period.



From Oman’s *History of the Art of War.*

Fig. 11.—Caerphilly Castle. Plan.



From Clark’s *Med. Mil. Arch.*

Fig. 12.—Caerphilly Castle. View.

Under his sons the importance of the chief castles was recognized as so great that the struggle for their control was in the forefront of every contest. When Richard made vast grants at his accession to his brother John, he was careful to reserve the possession of certain castles, and when John rose against the king’s minister, Longchamp, in 1191, the custody of castles was the chief point of dispute throughout their negotiations, and Lincoln was besieged on the king’s behalf, as were Tickhill, Windsor and Marlborough subsequently, while the siege of Nottingham had to be completed by Richard himself on his arrival. To John, in turn, as king, the fall of Château Gaillard meant the loss of Rouen and of Normandy with it, and when he endeavoured to repudiate the newly-granted Great Charter, his first step was to prepare the royal castles against attack and make them his centres of resistance. The barons, who had begun their revolt by besieging that of Northampton, now assailed that of Oxford as well and seized that of Rochester. The king recovered Rochester after a severe struggle and captured Tonbridge, but thenceforth there was a war of sieges between John with his mercenaries and Louis of France with his Frenchmen and the barons, which was specially notable for the great defence of Dover Castle by Hubert de Burgh against Louis. On the final triumph of the royal cause, after John’s death, at the battle of Lincoln, the general pacification was accompanied by a fresh issue of the Great Charter in the autumn of 1217, in which the precedent of Stephen’s reign was followed and a special clause inserted that all “adulterine” castles, namely those which had been constructed or rebuilt since the breaking out of war between John and the barons, should be immediately destroyed. And special stress was laid on this in the writs addressed to the sheriffs.

In 1223 Hubert de Burgh, as regent, demanded the surrender to the crown of all royal castles not in official custody, and though he succeeded in this, Falkes de Breauté, John’s mercenary, burst into revolt next year, and it cost a great national effort and a siege of nearly two months to reduce Bedford Castle, which he had held. Towards the close of Henry’s reign castles again asserted, in the Baron’s War, their importance. The Provisions of Oxford included a list of the chief royal castles and of their appointed castellans with the oath that they were to take; but the alien favourites refused to make way for them till they were forcibly ejected. When war broke out it was Rochester Castle that successfully held Simon de

Montfort at bay in 1264, and in Pevensey Castle that the fugitives from the rout of Lewes were able to defy his power. Finally, after his fall at Evesham, it was in Kenilworth Castle that the remnant of his followers made their last stand, holding out nearly five months against all the forces of the crown, till their provisions failed them at the close of 1266.

Thus for two centuries after the Norman Conquest castles had proved of primary consequence in English political struggles, revolts and warfare. And, although, when the country was again torn by civil strife, their military importance was of small account, the crown's historic jealousy of private fortification was still seen in the need to obtain the king's licence to "crenellate" (*i.e.* embattle) the country mansion.

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(J. H. R.)

CASTLEBAR, a market town and the county town of Co. Mayo, Ireland, in the west parliamentary division, on the river and near the lough of the same name, on the Manulla and Westport branch of the Midland Great Western railway. Pop. of urban district (1901) 3585. The county court buildings and other public offices occupy a square, and there is a pleasant mall shaded by fine trees. There are some breweries, and trade in linens and agricultural produce. The castle, which gives its name to the town, was a fortress of the De Burgh family; but the town itself was founded in the reign of James I., and received a charter from him in 1613. In 1641 the castle was held for the parliament by Sir Henry Bingham, but he was forced to surrender to Lord Mayo, and fell a victim, with all his garrison, to the fury and treachery of the besiegers. The massacre was afterwards avenged in 1653 by the execution of Sir Theobald Burke (by that time Lord Mayo), who had been in command along with his father at the siege. In 1798 the town was occupied for some weeks by the French under General J.J. Humbert, who had defeated the English under Luke Hutchison in a conflict which is jocularly styled the "Castlebar Races." The town returned two members to the Irish parliament until the Union. Four miles N.E. of Castlebar is Turlough, with a round tower 70 ft. high and 57 ft. in circumference, and other remains.

CASTLECONNELL, a village of Co. Limerick, Ireland, on the left bank of the Shannon, 8 m. N.E. of Limerick on the Great Southern & Western railway. It possesses a spa which was once considerably frequented, but is famous as a centre for the salmon fishing on the lower Shannon. Castleconnell is so intimately connected with this sport that it has given its name to a favourite pattern of fly-rod, in which a movable splice takes the place of the usual metal joint. The beautiful rapids of Doonas (avoided by a canal) are in the neighbourhood, and the surrounding scenery is generally attractive. There are remains of a castle from which the town took its name, which was the seat of the kings of Thomond, and was blown up by General Ginkel at the time of the siege of Limerick (1690).

CASTLE DONINGTON, a town in the Loughborough parliamentary division of Leicestershire, England, 123½ m. N.N.W. from London, on the Trent Junction and Western branch of the Midland railway. Pop. (1901) 2514. It lies on the flank of the hills overlooking the Trent and Soar valleys. There are slight remains of the castle. The church of St Luke is a fine building of Early English and later date. Donington Park, a neighbouring mansion, was offered to refugees during the French Revolution in 1830, and Charles X. availed himself of this retreat. Hosiery, silk and baskets are manufactured. Castle Donington is 2½ m. west of Kegworth station on the Midland main line. Kegworth (pop. 2078), on the Soar, has a hosiery and knitting industry.

CASTLE DOUGLAS, a burgh of barony and police burgh of Kirkcudbrightshire, Scotland. Pop. (1901) 3018. It is situated on Carlingwark Loch, 19½ m. S.W. of Dumfries by the Glasgow & South-Western railway. Its auction marts for sheep and cattle sales are the largest in the south-west of Scotland; at an autumn sale as many as 15,000 sheep and 1400 cattle are disposed of in one day. The leading industries comprise the making of agricultural implements and mineral waters, besides tanning. The Macmillan Free Church perpetuates the memory of John Macmillan (d. 1753), the Cameronian, who helped to found the Reformed Presbyterian Church. He had been chaplain to Murray of Broughton, and afterwards became minister of Balmaghie, about 3½ m. N.W. of Castle Douglas. The town is the chief centre of business in East Galloway, and it is also resorted to in midsummer for its beautiful scenery and excellent fishing. Till 1765 it was only a village under the name of Causewayhead, but the discovery of marl in the lake brought it some prosperity, and it was purchased in 1792 by Sir William Douglas and called after him. Since then its progress has been continuous. Carlingwark Loch contains several islets, on one of which is a crannog, or ancient lake dwelling.

CASTLEFORD, an urban district in the Osgoldcross parliamentary division of the West Riding of Yorkshire, England, on the river Aire near its junction with the Calder, 9 m. S.E. of Leeds, on the North-Eastern and Lancashire & Yorkshire railways. Pop. (1901) 17,386. Large glass-bottle and earthenware-jar works, chemical works, and neighbouring collieries employ the inhabitants. Here was the Roman village or fort of *Lagecium* or *Legeolium*; and though visible remains are wanting, a number of relics have been discovered.

CASTLE-GUARD, an arrangement under the feudal system, by which the duty of finding knights to guard royal castles was imposed on certain baronies, and divided among their knight’s fees. The greater barons provided for the guard of their castles by exacting a similar duty from their knights. In both cases the obligation was commuted very early for a fixed money payment, which, as “castle-guard rent” lasted on to modern times.

See J.H. Round, “Castle-Guard,” in *Archaeological Journal*, vol. lix., and “Castle-ward and Coinage,” in *The Commune of London.*

(J. H. R.)

CASTLEMAINE, a town of Talbot county, Victoria, Australia, 78 m. by rail N.N.W. of Melbourne. Pop. (1901) 5704. The gold-mines here were among the first discovered in the

colony, and dredging for gold is carried on in Barker's and Forrest creeks, at the junction of which the town stands. Slate and flagstone are largely quarried in the district, which also produces wine and much fruit, especially apples. Castlemaine has a reputation as a health resort in cases of pulmonary complaints.

CASTLE RISING, a village of Norfolk, England, 4 m. by road N.E. of King's Lynn. The Norman castle for which it is famous stands on slightly elevated ground overlooking, to the west, the low marshy coast of the Wash. Its site is enclosed by artificial ramparts of earth and a dyke which is crossed by an ancient bridge. The keep is square and massive, and fairly perfect, and it is not difficult to reconstruct the arrangement of the rooms. In some parts, especially the entrance, the Norman carving is very rich. The foundations of a small chapel with apsidal eastern termination have been discovered outside the castle. The village of Castle Rising is the decayed remnant of a town of no little importance. Its church of St Laurence is late Norman, with much rich ornamentation; it shows traces of considerable alterations in the Early English period, but is an admirable example of the earlier style.

It is a matter of dispute whether Rising was or was not an early Saxon settlement; in Domesday Book the manor is given as having belonged to Archbishop Stigand, from whom it had passed to Odo of Bayeux, whose estates were confiscated in 1088. Granted to William de Albini, whose son built Rising Castle, it passed first to Robert de Montalt, and then by sale to Isabel, queen of England, in 1332, remaining in the possession of the crown until Henry VIII. exchanged it for other lands with the duke of Norfolk. In 1269 an inquisition found that the lord had the return of all writs. In 1275 Robert de Montalt died seised of the manor and vill with the assize of bread and ale. An inquisition of 1379, although it makes no mention of the borough, states that the lord has the rents of assizes, and perquisites of the courts with view of frank-pledge. A mayor is first mentioned in 1343, and a borough existed in the 15th century. A survey of 1589-1590 declared that Castle Rising was an ancient borough by prescription according to the grant made to Hugh de Albini by Henry III. In 1589-1590 the recorder was chosen by the lord of the manor. The mayor, the only member of the corporation, whose sole duty was the holding of the assize of bread and ale, was chosen by the burgesses and presented at the court leet for confirmation. Castle Rising became a parliamentary borough in 1558, but was disfranchised in 1832 and the corporation abolished in 1835, although a mayor was elected for special purposes until 1883. Having no manufactures, the trade of the town depended entirely on its fairs and markets; but these have been long obsolete.

CASTLETON, a village in the High Peak parliamentary division of Derbyshire, England, 17 m. W.S.W. of Sheffield, and 2 m. from Hope station on a branch of the Midland railway. Pop. (1901) 547. Lying itself at an elevation of about 600 ft., it is surrounded on the north, west and south by hills from 1400 to 1700 ft. in height, rising sharply, and in parts precipitously. The village is celebrated for its situation in the midst of the wild Peak country, for the caves and mines in the neighbourhood, and for the Castle of the Peak, the ruins of which are strongly placed on a cliff immediately above the village. The Peak Cavern or Devil's Hole, penetrating this cliff, is the most magnificent in Derbyshire. For many generations the entrance to this cave has served as a workshop, held free of rent, to families employed in rope and twine making. Speedwell Cavern is not far distant, at the entrance to the fine pass of Winnats, by which Castleton and the Vale of Hope are approached from the west. The beauties of this cavern, in which occurs the so-called bottomless pit, are in part readily accessible by boat, but the approach to the inner or Cliff cavern is so difficult that it has rarely been explored. Among several other caves is that known as the Blue John Mine, from the decorative fluorspar called "Blue John" which is obtained here. The church of St Edmund, Castleton, retains a fine Norman chancel arch, and the vestry contains a valuable library. At Brough near Castleton was a Roman fort, established to hold in check the hillmen of the Peak. It was connected by roads with Buxton, Manchester and Rotherham. The Castle of the Peak, or Peveril Castle, is famous through Sir Walter Scott's novel *Peveril of the Peak*. Early

earthworks, which, extending from below the castle in a semicircle, enclosed the town, can still in great part be traced. Before the Conquest the site was held by Gernebern and Hundinc, and was granted by the Conqueror to William Peverell, by whom the castle was built. On the forfeiture of William Peverell, grandson of the first holder, it was granted by Henry II. to Prince John who, in 1204, made Hugh Nevill governor of the castle. In 1216 William Ferrers, earl of Derby, took it from the rebellious barons, and was made governor by Henry III., who in 1223 granted a charter for a weekly market at the town. In 1328 the castle was given to John of Gaunt on his marriage with Blanche of Lancaster, and thus became parcel of the duchy of Lancaster. The castle has often been used as a prison, and from its position was almost impregnable.

CASTLETOWN (Manx, *Bully Cashtel*), a town of the Isle of Man, 10 m. S.W. of Douglas, by the Isle of Man railway. Pop. (1901) 1975. It is picturesquely situated on both sides of a small harbour formed by the outflow of the Silver Burn into Castletown Bay. It was the legal capital of the island until 1862. In the centre of the town stands Castle Rushen, which is said to owe its foundation to the Danish chief, Guthred, in 947-960, though the existing building, which is remarkably well preserved, probably dates from the 14th century. Until the 18th century it was the residence of the lords of Man, and until 1891 served as a prison. The massive keep is square, and is surrounded by an outer wall, with towers and a moat. The council chamber and court-house were built in 1644. In the neighbourhood of the castle is the old House of Keys, where the members of the Manx parliament held their sessions until the removal of the seat of government to Douglas. A lofty Doric column commemorates Cornelius Smelt, lieutenant-governor of the island (d. 1832), near which there is a remarkable sun-dial with thirteen faces, dating from 1720. King William’s College, situated a mile to the north-east of the town, was opened in 1833; but a complete restoration was rendered necessary by fire in 1844, and it was subsequently enlarged. It is the chief educational establishment in the island. At Hango Hill near the town William Christian, receiver-general, who had surrendered the castle, and with it the island, to the parliamentary forces in 1651, was executed in 1663 at the instance of the countess of Derby, who had undertaken to defend it for the king. A small shipping trade is maintained.

CASTOR and **POLLUX** (Gr. Πολυδεύκης), in Greek and Roman mythology, the twin sons of Leda, and brothers of Helen and Clytaemnestra. They were also known under the name of Dioscuri (Διόσκοροι, later Διόσκουροι, children of Zeus), for, according to later tradition, they were the children of Zeus and Leda, whose love the god had won under the form of a swan. In some versions Leda is represented as having brought forth two eggs, from one of which were born Castor and Pollux, from the other Helen. In another account, Zeus is the father of Pollux and Helen, Tyndareus (king of Sparta) of Castor and Clytaemnestra. In Homer, Castor, Pollux and Clytaemnestra are said to be the children of Tyndareus and Leda, Helen the daughter of Leda by Zeus. The Dioscuri were specially reverenced among people of Dorian race, and were said to have reigned at Sparta, where also they were buried. They were also worshipped, especially in Athens, as lords and protectors (ἄνακες, ἄνακτες). Sailors in a storm prayed to them (Horace, *Odes*, i. 3) and sacrificed a white lamb, whereupon they were wont to appear in the form of fire at the masthead (probably referring to the phenomenon of St Elmo’s fire), and the storm ceased. Later, they were confounded with the Samothracian Cabeiri. In battle they appeared riding on white horses and gave victory to the side they favoured. They were the patrons of hospitality, and founded the sacred festival called Theoxenia. They presided over public games, Castor especially as the horse-tamer, Pollux as the boxer; but both are represented as riding on horseback or driving in a chariot. In Sparta their ancient symbol was two parallel beams δόκανα connected by cross-bars, which the Spartans took with them into the field (Plutarch, *De Fraterno Amore*, 1; Herodotus v. 75); later, they were represented by two amphorae with snakes twined round them. Their most important exploits were the invasion of Attica, to rescue their sister Helen from Theseus; their share in the hunting of the Calydonian boar (see Meleager) and the Argonautic expedition, and their battle with the sons of Aphareus, brought about by a quarrel in regard

to some cattle, in which Castor, the mortal (as the son of Tyndareus), fell by the hand of Idas. Pollux, finding him dead after the battle, implored Zeus to be allowed to die with him; this being impossible by reason of his immortality, Pollux was permitted to spend alternately one day among the gods, the other in Hades with his brother. According to another fable, the god marked his approval of their love by placing them together in the sky, as the Twins or the morning and evening star (Hyginus, *Poet. Astronom.* ii. 22). Like the Asvins of the *Veda*, the bringers of light in the morning sky, with whom they have been identified, the Dioscuri are represented as youthful horsemen, naked or wearing only a light chlamys. Their characteristic attribute is a pointed egg-shaped cap, surmounted by a star.

Though their worship was perhaps most carefully observed among people of Dorian origin, Castor and Pollux were held in no small veneration at Rome. It was the popular belief in that city from an early period that the battle of Lake Regillus had been decided by their interposition (Dion. Halic. vi. 13). They had fought, it was said, armed and mounted, at the head of the legions of the commonwealth, and had afterwards carried the news of the victory with incredible speed to the city. The well in the Forum at which they alighted was pointed out, and near it rose their ancient temple, in which the senate often held its sittings. On the 15th of July, the supposed anniversary of the battle, a great festival with sumptuous sacrifices was celebrated in their honour, and a solemn parade of the Roman knights (*transvectio equitum*), who looked upon the Dioscuri as their patrons, took place. (Apollodorus iii. 10. 7, 11. 2; Homer, *Odyssey*, xi. 299; Hyginus, *Fab.* 77. 155; Pindar, *Nem.* x. 60, 80 and schol.; Diod. Sic. iv. 43; Plutarch, *Theseus*, 32, 33; Theocritus, *Idyll*, xxii.)

See Maurice Albert, *Le Culte de Castor et Pollux en Italie* (1883), with special descriptions and representations in art, on coins, vases and statues; S. Eitrem, “Die göttlichen Zwillinge bei den Griechen” (treating of the divine beings mentioned in pairs in Greek mythology), in *Videnskabs-Selskab Skrifter* (Christiania, 1902); W.R. Paton, *De Cultu Dioscurorum apud Graecos* (Bonn, 1894); L. Myriantheus, *Açvins oder arische Dioskuren* (Munich, 1876); J.R. Harris, *The Dioscuri in the Christian Legends* (1903), and *The Cult of the Heavenly Twins* (1906); W. Helbig, “Die Castores als Schutzgötter des römischen Equitatus,” in *Hermes*, xl. (1905); C. Jaisle, *Die Dioskuren als Retter zur See bei Griechen und Romern, und ihr Fortleben in christlichen Legenden* (Tübingen, 1907); L. Preller, *Griechische und römische Mythologie*; articles by A. Furtwängler in Roscher’s *Lexikon der Mythologie*, and by M. Albert in Daremberg and Saglio’s *Dictionnaire des antiquités.*

CASTOR OIL, the fixed oil obtained from the seeds of the castor oil plant or Palma Christi, *Ricinus communis*, belonging to the natural order Euphorbiaceae. The botanical name is from Lat. *ricinus*, a tick, from the form and markings of the seed. The plant is a native of tropical Africa, but it has been introduced, and is now cultivated in most tropical and in the warmer temperate countries. In size it varies from a shrubby plant to a tree of from 30 to 40 ft. in height according to the climate in which it grows, being arborescent in tropical latitudes. On account of its very large beautiful palmate-peltate leaves, which sometimes measure as much as 2 ft. in diameter, it is cultivated as an ornamental plant. In the south of England, with the habit of an annual, it ripens its seeds in favourable seasons; and it has been known to come to maturity as far north as Christiania in Norway. Plants are readily grown from seed, which should be sown singly in small pots and placed in heat early in March. The young plants are kept under glass till early in June when they are hardened and put out. The fruit consists of a three-celled capsule, covered externally with soft yielding prickles, and each cell develops a single seed. The seeds of the different cultivated varieties, of which there are a great number, differ much in size and in external markings; but average seeds are of an oval laterally compressed form, with their longest diameter about four lines. They have a shining, marble-grey and brown, thick, leathery outer coat, within which is a thin dark-coloured brittle coat. A large distinct leafy embryo lies in the middle of a dense, oily tissue (endosperm). The seeds contain a toxic substance, which makes them actively poisonous; so much so that three have been known to kill an adult.

The oil is obtained from the seeds by two principal methods—expression and decoction—the latter process being largely used in India, where the oil, on account of its cheapness and abundance is extensively employed for illuminating as well as for other domestic and medicinal purposes. The oil exported from Calcutta to Europe is prepared by shelling and crushing the seeds between rollers. The crushed mass is then placed in hempen cloths and pressed in a screw or hydraulic press. The oil which exudes is mixed with water and heated

till the water boils, and the mucilaginous matter in the oil separates as a scum. It is next strained, then bleached in the sunlight, and stored for exportation. A considerable quantity of castor oil of an excellent quality is also made in Italy; and in California the manufacture is conducted on an extensive scale. The following is an outline of the process adopted in a Californian factory. The seeds are submitted to a dry heat in a furnace for an hour or thereby, by which they are softened and prepared to part easily with their oil. They are then pressed in a large powerful screw-press, and the oily matter which flows out is caught, mixed with an equal proportion of water, and boiled to purify it from mucilaginous and albuminous matter. After boiling about an hour, it is allowed to cool, the water is drawn off, and the oil is transferred to zinc tanks or clarifiers capable of holding from 60 to 100 gallons. In these it stands about eight hours, bleaching in the sun, after which it is ready for storing. By this method 100 lb of good seeds yield about 5 gallons of pure oil.

Castor oil is a viscid liquid, almost colourless when pure, possessing only a slight odour, and a mild yet highly nauseous and disagreeable taste. Its specific gravity is .96, a little less than that of water, and it dissolves freely in alcohol, ether and glacial acetic acid. It contains palmitic and several other fatty acids, among which there is one—ricinoleic acid—peculiar to itself. This occurs in combination with glycerin, constituting the greater part of the bulk of the oil.

The active principle to which the oil owes its purgative properties has not been isolated. It is, indeed, probable that it is formed in the intestine, as a result of some decomposition as yet unknown. The dose is from a drachm to an ounce. The pharmacopoeial mixture is best avoided, being almost uniquely nauseous. By far the best way to administer the oil is in capsules. It acts in about five hours, affecting the entire length of the bowel, but not increasing the flow of bile except in very large doses. The mode of its action is unknown. The oil will purge when rubbed into the skin or injected *per rectum*. It is an invaluable drug in temporary constipation and whenever a mild action is essential, as in pregnancy. It is extremely useful for children and the aged, but must not be employed in cases of chronic constipation, which it only aggravates, whilst relieving the symptoms.

CASTRÉN, MATTHIAS ALEXANDER (1813-1853), Finnish ethnologist and philologist, was born at Tervola, in the parish of Kemi in Finland, on the 20th of November (December 2, 1813). His father, Christian Castrén, parish minister at Rovaniemi, died in 1825; and Matthias passed under the protection of his uncle, Mathias Castrén, the kindly and learned incumbent of Kemi. At the age of twelve he was sent to school at Uleåborg, and there he helped to maintain himself by teaching the younger children. On his removal to the Alexander University at Helsingfors in 1830, he first devoted himself to Greek and Hebrew with the intention of entering the church; but his interest was soon excited by the language of his native country, and he even began before his course was completed to lay the foundations of a work on Finnish mythology. The necessity of personal explorations among the still unwritten languages of cognate tribes soon made itself evident; and in 1838 he joined a medical fellow-student, Dr. Ehrstrom, in a journey through Lapland. In the following year he travelled in Russian Karelia at the expense of the Literary Society of Finland; and in 1841 he undertook, in company with Dr Elias Lonnrot, the great Finnish philologist, a third journey, which ultimately extended beyond the Ural as far as Obdorsk, and occupied a period of three years. Before starting on this last expedition he had published a translation into Swedish of the Finnish epic of *Kalevala*; and on his return he gave to the world his *Elementa grammatices Syrjaenae* and *Elementa grammatices Tscheremissae*, 1844. No sooner had he recovered from the illness which his last journey had occasioned than he set out, under the auspices of the Academy of St Petersburg and the Helsingfors University, on an exploration of the whole government of Siberia, which resulted in a vast addition to previous knowledge, but seriously affected the health of the adventurous investigator. The first-fruits of his collections were published at St Petersburg in 1849 in the form of a *Versuch einer ostjakischen Sprachlehre*. In 1850 he published a treatise *De affixis personalibus linguarum Altaicarum*, and was appointed professor at Helsingfors of the new chair of Finnish language and literature. The following year saw him raised to the rank of chancellor of the university; and he was busily engaged in what he regarded as his principal work, a Samoyedic grammar, when he died on the 7th of May 1853.

Five volumes of his collected works appeared from 1852 to 1858, containing respectively—

(1) *Reseminnen från åren* 1838-1844; (2) *Reseberaitelser och bref åren* 1845-1849; (3) *Forelasningar i Finsk mythologi*; (4) *Ethnologiska forelasningar ofver Altaiska folken*; and (5) *Smarre afhandlingar och akademiska dissertationer*. A German translation was published by Anton Schiefner, who was also entrusted by the St Petersburg Academy with the editing of his manuscripts which had been left to the Helsingfors University and which were subsequently published.

CASTRENSIS, PAULUS, an Italian jurist of the 14th century. He studied under Baldus at Perugia, and was a fellow-pupil with Cardinal Zabarella. He was admitted to the degree of doctor of civil law in the university of Avignon, but it is uncertain when he first undertook the duties of a professor. A tradition, which has been handed down by Panzirolus, represents him as having taught law for a period of fifty-seven years. He was professor at Vienna in 1390, at Avignon in 1394, and at Padua in 1429; and, at different periods, at Florence, at Bologna and at Perugia. He was for some time the vicar-general of Cardinal Zabarella at Florence, and his eminence as a teacher of canon law may be inferred from the language of one of his pupils, who styles him “famosissimus juris utriusque monarca.” His most complete treatise is his readings on the *Digest*, and it appears from a passage in his readings on the *Digestum Vetus* that he delivered them at a time when he had been actively engaged for forty-five years as a teacher of civil law. His death is generally assigned to 1436, but it appears from an entry in a MS. of the *Digestum Vetus*, which is extant at Munich, made by the hand of one of his pupils who styles him “praeceptor meus,” that he died on the 20th of July 1441.

CASTRES, a town of south-western France, capital of an arrondissement in the department of Tarn, 29 m. S.S.E. of Albi on a branch line of the Southern railway. Pop. (1906) town, 19,864; commune, 28,272. Castres, the busiest and most populous town of its department, is intersected from north to south by the Agout; the river is fringed by old houses the upper stories of which project over its waters. Wide boulevards traverse the west of the town, which is also rendered attractive by numerous fountains fed by a fine aqueduct hewn in the rock. The church of St Benoît, once a cathedral, and the most important of the churches of Castres, dates only from the 17th and 18th centuries. The hôtel de ville, which contains a museum and the municipal library, occupies the former bishop’s palace, designed by Jules Mansart in the 17th century; the Romanesque tower beside it is the only survival of an old Benedictine abbey. The town possesses some old mansions of which the hôtel de Nayrac, of the Renaissance, is of most interest. Castres has a sub-prefecture, tribunals of first instance and of commerce, a board of trade-arbitrators, a chamber of commerce, a branch of the bank of France and two hospitals. There are also communal colleges for boys and girls, a school of artillery and school of draughtsmanship. The industrial establishments include manufactories of earthenware and porcelain and metal-foundries, and tanning, leather-dressing, turnery, the making of wooden shoes and furniture, the weaving of woollen and other fabrics, dyeing, and the manufacture of machinery, paper and parchment are carried on.

Castres grew up round a Benedictine abbey, which is believed to have been founded in the 7th century. It was a place of considerable importance as early as the 12th century, and ranked as the second town of the Albigenses. During the Albigensian crusade it surrendered of its own accord to Simon de Montfort; and in 1356 it was raised to a countship by King John of France. On the confiscation of the possessions of the D’Armagnac family, to which it had passed, it was bestowed by Louis XI. on Boffilo del Giudice, but the appointment led to so much disagreement that the countship was united to the crown by Francis I. in 1519. In the wars of the latter part of the 16th century the inhabitants sided with the Protestant party, fortified the town, and established an independent republic. They were brought to terms, however, by Louis XIII., and forced to dismantle their fortifications; and the town was made the seat of the *chambre de l’édit*, or chamber for the investigation of the affairs of the Protestants, afterwards transferred to Castelnaudary (in 1679). The bishopric of Castres, which had been established by Pope John XXII. in 1317, was abolished at the Revolution.

CASTRO, INEZ DE (d. 1355), mistress, and perhaps wife, of Peter I. (Pedro), king of Portugal, called *Collo de Garza*, *i.e.* “Heron’s Neck,” was born in Spanish Galicia, in the earlier years of the 14th century. Tradition asserts that her father, Don Pedro Fernandez de Castro, and her mother, Dona Aldonça Soares de Villadares, a noble Portuguese lady, were unmarried, and that Inez and her two brothers were consequently of bastard birth. Educated at the semi-Oriental provincial court of Juan Manuel, duke of Peñafiel, Inez grew up side by side with Costança, the duke’s daughter by a scion of the royal house of Aragon, and her own cousin. After refusing several crowned heads in marriage, Costança was at last persuaded to accept the hand of the infante Dom Pedro, son of Alphonso the Proud, king of Portugal. In 1341 the two girls left Peñafiel; Costança’s marriage was celebrated in the same year, and the young infanta and her cousin went to reside at Lisbon, or at Coimbra, where Dom Pedro conceived that luckless and furious passion for Inez which has immortalized them.

The morality of the age was lax, and more especially so in Spain and Portugal, where the looseness of the marriage tie and the example of the Moors encouraged polygamy. Pedro’s connexion *par amours* with Inez would of itself have aroused no opposition. He might even have married her, after the death of his wife in childbirth in 1345. According to his own assurance he did marry her in 1354. But by that time the rising power of the Castro family had created the most brutal hatred among their rivals, both in Spain and Portugal. Alvaro Gonzales, Pedro Coelho, and Diogo Lopes Pacheco persuaded the king, Alphonso, that his throne was in danger from an alliance between his son and the Castros, and with all the brutality of the age they urged the king to remove the danger by murdering the poor woman. The old king listened, refused, wavered and ended by yielding. He went in secret to the palace at Coimbra, where Inez and the infante resided, accompanied by his three familiars, and by others who agreed with them. The beauty and tears of Inez disarmed his resolution, and he turned to leave her; but the gentlemen about him had gone too far to recede. Inez was stabbed to death and was buried immediately in the church of Santa Clara.

The infante raised at once the flag of revolt against his father, and was only appeased by the concession of a large share in the government. The three murderers of Inez were sent out of the kingdom by Alphonso, who knew his son too well not to be aware that the vengeance would be tremendous as the crime. They took refuge in Castile. In 1357, however, Alphonso died, and the infante was crowned king of Portugal. Peter the Cruel, his nephew, reigned over Castile; and the murderers were given up as soon as required. Diogo Lopes escaped through the gratitude of a beggar to whom he had formerly done a kindness; but Coelho and Gonzales were executed, with horrible tortures, in the very presence of the king.

The story of the exhumation and coronation of the corpse of Inez has often been told. It is said that to the dead body, crowned and robed in royal raiment, and enthroned beside the king, the assembled nobles of Portugal paid homage as to their queen, swearing fealty on the withered hand of the corpse. The gravest doubts, however, exist as to the authenticity of this story; Fernão Lopes, the Portuguese Froissart, who is the great authority for the details of the death of Inez, with some of the actors in which he was acquainted, says nothing of the ghastly ceremony, though he tells at length the tale of the funeral honours that the king bestowed upon his wife. Inez was buried at Alcobaça with extraordinary magnificence, in a tomb of white marble, surmounted by her crowned statue; and near her sepulchre Pedro caused his own to be placed. The monument, after repeatedly resisting the violence of curiosity, was broken into in 1810 by the French soldiery; the statue was mutilated, and the yellow hair was cut from the broken skeleton, to be preserved in reliquaries and blown away by the wind. The children of Inez shared her habit of misfortune. From her brother, however, Alvaro Perez de Castro, the reigning house of Portugal directly descends.

See Fernão Lopes, *Chronica del Rey Dom Pedro* (1735); Camoens, *Os Lusiadas*; Antonio Ferreira’s *Ines de Castro*,—the first regular tragedy of the Renaissance after the *Sofonisba* of Trissino; Luis Velez de Guevara, *Reinar despues de morir*, an admirable play; and Ferdinand Denis, *Chroniques chevaleresques de l’Espagne et du Portugal*.

CASTRO, JOÃO DE (1500-1548), called by Camoens *Castro Forte*, fourth viceroy of the Portuguese Indies, was the son of Alvaro de Castro, civil governor of Lisbon. A younger son, and destined therefore for the church, he became at an early age a brilliant humanist, and studied mathematics under Pedro Nunez, in company with the infante Dom Luis, son of Emanuel the First, with whom he contracted a life-long friendship. At eighteen he went to Tangier, where he was dubbed knight by Duarte de Menezes the governor, and there he remained several years. In 1535 he accompanied Dom Luis to the siege of Tunis, where he had the honour of refusing knighthood and reward at the hands of the great emperor Charles V. Returning to Lisbon, he received from the king the small commandership of São Pablo de Salvaterra in 1538. He was exceedingly poor, but his wife Lenor de Coutinho, a noble Portuguese lady, admired and appreciated her husband sufficiently to make light of their poverty. Soon after this he left for the Indies in company with his uncle Garcia de Noronha, and on his arrival at Goa enlisted among the *aventureiros*, "the bravest of the brave," told off for the relief of Diu. In 1540 he served on an expedition under Estevão da Gama, by whom his son, Alvaro de Castro, a child of thirteen, was knighted, out of compliment to him. Returning to Portugal, João de Castro was named commander of a fleet, in 1543, to clear the European seas of pirates; and in 1545 he was sent, with six sail, to the Indies, in the room of Martin de Sousa, who had been dismissed the viceroyalty. The next three years were the hardest and most brilliant, as they were the last, of his life—years of battle and struggle, of glory and sorrow, of suffering and triumph. Valiantly seconded by his sons (one of whom, Fernão, was killed before Diu) and by João Mascarenhas, João de Castro achieved such popularity by the overthrow of Mahmud, king of Gujarat, by the relief of Diu, and by the defeat of the great army of the Adil Khan, that he could contract a very large loan with the Goa merchants on the simple security of his moustache. These great deeds were followed by the capture of Broach, by the complete subjugation of Malacca, and by the passage of Antonio Moniz into Ceylon; and in 1547 the great captain was appointed viceroy by João III., who had at last accepted him without mistrust. He did not live long to fill this charge, expiring in the arms of his friend, St Francis Xavier, on the 6th of June 1548. He was buried at Goa, but his remains were afterwards exhumed and conveyed to Portugal, to be reinterred under a splendid monument in the convent of Bemfica.

See Jacinto Freire de Andrade, *Vida de D. João de Castro* (Lisbon, 1651), English translation by Sir Peter Wyche (1664); Diogo de Couto, *Decadas da Asia*, vi. The *Roteiros* or logbooks of Castro's voyages in the East (Lisbon, 1833, 1843 and 1872) are of great interest.

CASTROGIOVANNI (Arab. *Kasr-Yani*, a corruption of *Castrum Ennae*), a town and episcopal see of the province of Caltanisetta, Sicily, 95 m. by rail S.E. of Palermo, and 56 m. W. of Catania, situated 2605 ft. above sea-level, almost in the centre of the island, and commanding a magnificent view of the interior. Pop. (1901) 25,826. Enna was one of the cities of the Sicels, and the statement of Stephanus Byzantinus that it was colonized by Syracuse in 664 B.C. is improbable. The question is discussed by E. Pais, *Atakta* (Pisa, 1891), 63. It does not appear in history before the time of Dionysius I. of Syracuse, who, after unsuccessful attempts, finally acquired possession of it by treachery about 397 B.C. Its natural position rendered it a fortress of great importance, and it is frequently mentioned in subsequent history. In 134-132 it was the headquarters of the slave revolt, and was only reduced by treachery. Cicero speaks of it as a place of some importance, but in imperial times it seems to have been of little account. In A.D. 837 the Saracens attempted to take it, but without success; and it was again only by treachery that they were able to take it in 859. In 1087 it fell into the hands of the Normans; and the existing remains of fortifications are entirely medieval. There are indeed no remains of earlier days. The cathedral, founded in 1307, is of some interest. There are no remains of the famous temple of Demeter, from which Verres, as Cicero tells us, removed the bronze statue of the goddess. The lake of Pergus, where Persephone, according to one of the myths, was carried off by Hades, lies 4 m. to the south. The myth itself must have had some local origin, but has had so much Greek detail grafted upon it that the very names of the earlier Sicel deities have been displaced.

CASTRO URDIALES, a seaport of northern Spain, in the province of Santander, situated on the bay of Biscay and at the head of a branch railway connected with the Bilbao-Santander line. Pop. (1870) about 3500; (1900) 14,191. Castro Urdiales is a modern town, although its castle and parish church date from the middle ages. It was destroyed by the French in 1813, but speedily rebuilt and fortified. Its rapid rise in population and prosperity dates from the increased development of iron-mining and railway communication which took place after 1879. Its chief industries are iron-mining, fishing, and the preservation of fish, especially sardines, in oil. Between 1894 and 1904 the exports of iron ore rose from 277,200 tons to 516,574 tons.

CASTRO Y BELLVIS, GUILLÉN DE (1569-1631), Spanish dramatist, was a Valencian by birth, and early enjoyed a reputation as a man of letters. In 1591 he became a member of a local literary academy called the *Nocturnos*. At one time a captain of the coast-guard, at another the protégé of Benavente, viceroy of Naples, who appointed him governor of Scigliano, patronized by Osuna and Olivares, Castro was nominated a knight of the order of Santiago in 1623. He settled at Madrid in 1626, and died there on the 28th of July 1631 in such poverty that his funeral expenses were defrayed by charity. He probably made the acquaintance of Lope de Vega at the festivals (1620-1622) held to commemorate the beatification and canonization of St Isidore, the patron saint of Madrid. On the latter occasion Castro's *octavas* were awarded the first prize. Lope de Vega dedicated to him a celebrated play entitled *Las Almenas de Toro* (1619), and when Castro's *Comedias* were published in 1618-1621 he dedicated the first volume to Lope de Vega's daughter. The drama that has made Castro's reputation is *Las Mocedades del Cid* (1599?), to the first part of which Corneille was largely indebted for the materials of his tragedy. The two parts of this play, like all those by Castro, have the genuine ring of the old *romances*; and, from their intense nationality, no less than for their primitive poetry and flowing versification, were among the most popular pieces of their day. Castro's *Fuerza de la costumbre* is the source of *Love's Care*, a play ascribed to Fletcher. He is also the reputed author of *El Prodigio de los Montes*, from which Calderón derived *El Mágico prodigioso*.

Las Mocedades del Cid (Toulouse, 1890) and *Ingratitud de amor* (Philadelphia, 1899) have been well edited by E. Mérimée and H.A. Rennert respectively.

CASTRUCCIO CASTRACANI DEGLI ANTELMINELLI (1281-1328), duke of Lucca, was by birth a Lucchese, and by descent and training a Ghibelline. Being exiled at an early age with his parents and others of their faction by the Guelphs, then in the ascendant, and orphaned at nineteen, he served as a *condottiere* under Philip IV. of France in Flanders, later with the Visconti in Lombardy, and in 1313 under the Ghibelline chief, Uguccione della Faggiuola, lord of Pisa, in central Italy. He assisted Uguccione in many enterprises, including the capture of Lucca (1314) and the victory over the Florentines at Montecatini (1315). An insurrection of the Lucchese having led to the expulsion of Uguccione and his party, Castruccio regained his freedom and his position, and the Ghibelline triumph was presently assured. Elected lord of Lucca in 1316, he warred incessantly against the Florentines, and was at first the faithful adviser and stanch supporter of Frederick of Austria, who made him imperial vicar of Lucca in 1320. After the battle of Mühlbach he went over to the emperor Louis the Bavarian, whom he served for many years. In 1325 he defeated the Florentines at Altopascio, and was appointed by the emperor duke of Lucca, Pistoja, Volterra and Luni, and two years later he captured Pisa, of which he was made imperial vicar. But, subsequently, his relations with Louis seem to have grown less friendly and he was afterwards excommunicated by the papal legate in the interests of the Guelphs. At his death in 1328 the fortunes of his young children were wrecked in the Guelphic triumph.

Niccolò Machiavelli's *Life of Castruccio* is a mere romance; it was translated into French, with notes, by Dreux de Radier in 1753. See Niccolò Negrini, *Vita di Castruccio* (Modena, 1496); Winkler's *Castruccio, Herzog von Lucca* (Berlin, 1897); also Gino Capponi's *Storia di Firenze*, and G. Sforza, *Castruccio Castracani degli Antelminelli in Lunigiana* (Modena,

1891); S. de Sismondi, *Histoire des républiques italiennes* (Brussels, 1838).

CASTRUM MINERVAE (mod. *Castro*), an ancient town of the Sallentini in Calabria, 10 m. south of Hydruntum, with an ancient temple of Minerva, said to have been founded by Idomeneus, who formed the tribe of the Sallentini from a mixture of Cretans, Illyrians and Italian Locrians. It is also said to have been the place where Aeneas first landed in Italy, the port of which he named *Portus Veneris.* The temple had lost some of its importance in Strabo's day.

CASUARINA, a genus of trees containing about 30 species, chiefly Australian, but a few Indo-Malayan. The long whip-like green branches are longitudinally grooved, and bear at the nodes whorls of small scale-leaves, the shoots resembling those of *Equisetum* (horse-tail). The flowers are unisexual; the staminate are borne in spikes, each flower consisting of a central stamen which is surrounded by two scale-like perianth-leaves. The pistillate are borne in dense spherical heads; each flower stands in the axil of a bract and consists of two united carpels flanked by a pair of bracteoles; the long styles hang out beyond the bracts, and the one-chambered ovary contains two ovules. In the fruit the bracteoles form two woody valves between which is a nut; the aggregate of fruits resemble small cones. Pollen is transferred by the wind to the long styles. The pollen-tube does not penetrate the ovule through the micropyle but enters at the opposite end—the chalaza. This anomaly was discovered by Dr M. Treub (see *Annal. Jardin Botan. Buitenzorg*, x. 1891), and is associated with a peculiar development of the ovule, and an increased number and peculiar form of the embryo-sacs (nacrospores). Treub proposed to separate *Casuarina* as a distinct group of Angiosperms, and suggested the following arrangement:—

Angiospermae { Porogamae } Dicotyledons. Monocotyledons.
Angiospermae { Chalazogamae (*Casuarina*).

The names of the two subdivisions recall the manner of entrance of the pollen-tube. More recent investigations, chiefly by Nawaschin and Miss Benson, on members of the orders Betulaceae, Fagaceae, Juglans and Ulmus, showed a recurrence in a greater or less degree of the various anomalies previously observed in *Casuarina*, and suggest that the affinity of *Casuarina* is with these orders of Dicotyledons.

The wood is very hard, and several species are valuable timber trees. From a fancied resemblance of the wood to that of the oak these trees are known as "oaks," and the same species has different names in different parts such as "she-oak," "swamp-oak," "shingle-oak," "river-oak," "iron-wood," "beef-wood," &c.

See J.H. Maiden, *Useful Native Plants of Australia* (London and Sydney, 1889).

CASUISTRY (from the Lat. *casus*, a point of law), the art of bringing general moral principles to bear on particular actions. It is, in short, applied morality; anybody is a casuist who reflects about his duties and tries to bring them into line with some intelligible moral standard. But morality at different times has worn very different dresses. It has sometimes been thought of as an outward law, sometimes as an inward disposition; and each of these rival conceptions has developed a casuistical method of its own. Believers in law have put their trust in authority or logic; while believers in disposition chiefly look to our instinctive faculties—conscience, common-sense or sentiment. The legal is the older group, and to it the

name of casuist is often exclusively reserved, generally with the implication that its methods are too purely technical to commend themselves to mankind at large. But common-sense and conscience are quite as definite guides as logic or authority; and there seems no good reason for refusing to give the name of casuistry to their operations.

The casuistry of primitive man is uncompromisingly legal. His morality is not yet separated from his religion; and religion for him means the cult of some superior being—the king or priest of his tribe—whose person is charged with a kind of sacred electricity. “His divinity is a fire, which, under proper restraints, confers endless blessings; but if rashly touched, or allowed to break bounds, it burns or destroys what it touches. Hence the disastrous effects supposed to follow a breach of taboo; the offender has thrust his hand into the divine fire, which shrivels up and consumes him on the spot” (Frazer, *The Golden Bough*, i. 169). Elaborate rules are accordingly drawn up to secure the maximum of benefit, and the minimum of inconvenience, from this sacred fire; and in the application of these rules does savage casuistry consist. At a higher stage of civilization the god is no longer present in person but issues to his worshippers categorical commands. These logic must seize upon and develop as far as they will go; for the breach of some trifling consequence of a rule might mean the loss of the deity’s favour. Hence the rise of sacred books among most Eastern peoples. On the Jewish Decalogue, for instance, follows the law, and on the law the rabbinical schools. Some of these will be stricter, and some laxer; but on the whole all tend to “aggravate” the law—down to the point of forbidding the faithful to wear a girdle, or to kill a noxious insect on the Sabbath. Though indeed we might look nearer home than the Talmud for similar absurdities; most Puritan communities could furnish strange freaks of Sabbatarian casuistry. Nor have the Catholics been one whit behind them. Their scholastic doctors gravely discuss whether—since water is the “matter” of baptism—a soul can be made regenerate by milk, or rose-water or wine.

At the opposite pole stood ancient Greece. Here ceremonial casuistry found no place, because there were no sacred books. “Among the Greeks writing never attained the consecration of religion. No system of doctrine and observance, no manuals containing authoritative rules of morality, were ever transmitted in documentary form. In conduct they shrank from formulae. Unvarying rules petrified action; the need of flexibility, of perpetual adjustment, was strongly felt” (Butcher, *The Greek Genius*, p. 182). For this reason their interest in ethical speculations was all the keener; their great thinkers were endlessly engaged in settling what the relation ought to be between duty and self-interest. Ought one to swallow up the other—and, if so, which should prevail? Or was it possible to patch up a compromise between them? The great Stoic philosophers took the austerest line, and held that duty should always and everywhere be our only law. But it was one thing to enunciate such magnificent theories in a lecture, and quite another to apply them in the market-place. Casuistry came to the aid of average human nature—that is to say, pupils began to confront the master with hard cases taken from daily life. And more than one master was disposed to make large—even startlingly large—concessions to the exigencies of practice. This concrete side of moral philosophy came specially into evidence when Stoicism was transplanted to Rome. Cicero’s *De Officiis* abounds in the kind of question afterwards so warmly discussed by Dr Johnson and his friends. Is it ever right to tell a lie? May a lawyer defend a client whom he knows to be guilty? In selling my goods, is it enough not to disguise their shortcomings, or ought I candidly to admit them? Seneca even made the discussion of such problems into a regular discipline, claiming that their concrete character gave an interest in morality to those who had no love for abstractions; while they prevented those who had from losing themselves in the clouds. And M. Thamin maintains that, if his heroes did not form great characters, at any rate they taught the Roman child to train its conscience. But, then, Cicero and Seneca took common-sense as their guide. They decided each problem on its merits, looking more to the spirit than to the letter, and often showing a practical sagacity worthy of Johnson himself. Quite in the great doctor’s spirit is Cicero’s counsel to his son, to hear what the philosophers had to say, but to decide for himself as a man of the world. Such advice could not be grateful to the philosophers themselves—then a definite professional class, not unlike the “spiritual directors” of a later Rome, who earned their bread by smoothing away the doubts of the scrupulous on all matters intellectual and moral. Their great weapon was their logic; and a logician, as Pascal says, must be very unfortunate or very stupid if he cannot manage to find exceptions to every conceivable rule. In their hands casuistry became the art of finding such exceptions. From the Greek sophists they borrowed ingenious ways of playing off one duty against another, or duty in general against self-interest—leaving the doubter in the alternative of neglecting the one and being a knave, or neglecting the other and being a fool. Or else they raised a subtle distinction between the act and the intention. To get drunk for the sake of the drink was the mark of a beast; but wine was a powerful stimulant to the brain, and to fuddle oneself in order to think great thoughts was worthy of a sage. No doubt these

airy paradoxes were not always seriously taken; but it is significant that a common Roman proverb identified “philosophizing” (*philosophatur*) with thinking out some dirty trick.

Christianity swept the whole discussion on to a higher plane. All the stress now fell on the disposition, not on the outward act. The good deeds of a just man were a natural consequence of his justice; whereas a bad man was no whit the better, because he now and then deviated into doing right. Actions, in short, were of no account whatever, apart from the character that produced them. “All things are lawful unto me,” said St Paul, “but all are not expedient.” And St Augustine sums the whole matter up in the famous phrase: “Have charity, and do as thou wilt.” Narrow-minded Christian consciences, however, could not stay long on this level; law was so very much more satisfying a guide than vague, elusive charity. And law in plenty was forthcoming, so soon as the Church developed the discipline of public confessions followed by appropriate penances for each fault. At first the whole proceeding was informal and impulsive enough; but by the 7th century it had grown thoroughly stereotyped and formal. *Libri Poenitentiales* began to appear—detailed lists of all possible sins, with the forfeit to be exacted from each. As public penance finally decayed, and auricular confession took its place, these were superseded by the *Summae de Poenitentia*,—law-books in the strictest sense. These were huge digests of all that popes, councils, primitive fathers had decided on every kind of question pertaining to the confessional—what exactly is a sin, what kind of questions the priests must ask, under what conditions he could give absolution. As such, they were eagerly welcomed by the clergy; for a single magistrate, sitting in secret without appeal, necessarily grasps at whatever will lighten his burden of responsibility. Nor was their complexity a stumbling-block. The medieval mind was only too prone to look on morality as a highly technical art, quite as difficult as medicine or chancery law—a path where wayfaring men were certain to err, with no guide but their unsophisticated conscience. What could they possibly do but cling to their priest with a “blind and unexpressed faith”?

Against this state of things the Reformation was a violent protest. Catholicism increasingly took for granted that a man imperilled his soul by thinking for himself; Protestantism replied that he could certainly lose it, if he left his thinking to another. For it is to the individual conscience that God speaks; through the struggles of the individual conscience He builds up a strong and stable Christian character. “A man may be a heretic in the truth,” says Milton in his *Areopagitica* (1644), “if he believes things only because his pastor says so, or the Assembly so determines, without knowing other reason, though his belief be true, yet the very truth he holds becomes his heresy. There is not any burden that some would not gladlier post off to another than the charge and care of their religion. A wealthy man, addicted to his pleasures and his profits, finds religion to be a traffic so entangled, and of so many piddling accounts, that of all mysteries he cannot skill to keep a stock going upon that trade. What does he therefore but resolve to give over toiling, and find himself some factor, to whose care and conduct he may commit the whole managing of his religious affairs—some divine of note and estimation that must be. To him he adheres, resigns the whole warehouse of his religion with all the locks and keys into his custody, and indeed makes the very person of that man his religion. So that a man may say his religion is now no more within himself, but is become a dividual moveable, which goes or comes near him, according as that good man frequents the house.”

Twelve years after the *Areopagitica* appeared Pascal’s *Provincial Letters* (1656-1657). These deal with the casuists of the Counter-Reformation in the spirit of Milton, laying especial stress on the artificiality of their methods and the laxity of their results. Not, of course, that they meant deliberate evil; Pascal expressly credits them with good intentions. But they were drawn, almost to a man, from Italy or Spain, the two countries least alive to the spirit of the Reformation; and most of them were Jesuits, the order that set out to be nothing Protestantism was, and everything that Protestantism was not. Hence they were resolutely opposed to any idea of reform; for to begin making changes in the Church’s system would be a tacit admission that Luther had some show of reason on his side. On the other hand, they would certainly lose their hold on the laity, unless some kind of change were made; for many of the Church’s rules were obsolete, and others far too severe to impose on the France of Montaigne or even the Spain of Cervantes. Thus caught between two fires the casuists developed a highly ingenious method, not unlike that of the Roman Stoics, for eviscerating the substance of a rule while leaving its shadow carefully intact. The next step was to force the confessors to accept their lax interpretation of the law; and this was accomplished by their famous theory of *probabilism*—first taught in Spain about 1580. This made it a grave sin in the priest to refuse absolution, whenever there was some good reason for giving it even when there were other and better reasons for refusing it. This principle does not deserve all the abuse that has been lavished upon it. It secured uniformity in the

confessional, and thereby protected the penitent from the caprices of individual priests; and by depriving these of responsibility, it forced the penitent back on himself. But the gain was more than counterbalanced by the evil. The less the Church could expect from its penitents, the more it was driven to trust to the miraculous efficiency of sacramental grace. Once get a sinner to confession, and the whole work was done. However bad his natural disposition, the magical words of absolution would make him a new man. As for most penitents, all they cared for was to scrape through by the skin of their teeth. Casuistry might insist that it only proposed to fix the minimum of a minimum, and beg them for their soul's sake to aim a little higher. Human nature seldom resists the charms of a fixed standard—least of all when it is applied by a live judge in a visible court. If the priest must be satisfied with little, why be at the trouble of offering more? For this reason, probabilism found vigorous opponents in Bossuet and other eminent divines; and various of its excesses were condemned by the popes during the latter half of the 17th century. After a long eclipse it was finally re-established, though in a very modified form, by Alfonso Liguori about the middle of the 18th century.

In Protestant countries casuistry shrank and dwindled, though works on the subject continued to be written both in Germany and England during the 17th century. The best known of the Anglican books is Jeremy Taylor's *Ductor Dubitantium* (1660). But the Protestant casuist never pretended to speak authoritatively; all he did was to give his reasons, and leave the decision to the conscience of his readers. "In all this discourse," says Bishop Sanderson, one of the best of the English writers, "I take it upon me not to write edicts, but to give my advice." Very soon, however, these relics of casuistry were swept away by the rising tide of common-sense. The 18th century loved to discuss hard cases of conscience, as a very cursory glance at Fielding's novels (1742-1751) or Boswell's *Life of Johnson* (1791) will show. But the age was incurably suspicious of attempts to deal with such difficulties on any kind of technical system. Pope was never tired of girding at

> "Morality by her false guardians drawn,
> Chicane in furs, and casuistry in lawn";

while Fielding has embodied the popular conception of a casuist in Parson Thwackum and Philosopher Square, both of whom only take to argument when they want to reason themselves out of some obvious duty. Still more outspoken is the Savoyard vicar in the *Émile* (1762) of Jean Jacques Rousseau: "Whence do I get my rules of action? I find them in my heart. All I feel to be good is good; all I feel to be evil is evil. Conscience is the best of casuists; it is only when men wish to cheat it that they fly to logical quibbles." Extravagant as this sentiment sounds, it paved the way to better things. The great object of 17th-century moralists had been to find some general principle from which the whole of ethics could be deduced; common-sense, by turning its back on abstract principles of every kind, forced the philosophers to come down to the solid earth, and start by inquiring how the world does make up its mind in fact. During the last two centuries deduction has gone steadily out, and psychology come in. Ethics have become more distinctively a science, instead of an awkward hybrid between a science and an art; their business has been to investigate what moral conduct is, not to lay down the law as to what it ought to be. Hence they deliberately refuse to engage in casuistry of the old-fashioned sort. Further, it is increasingly felt that ethical judgments do not depend on reason alone, but involve every element in our character; and that the real problem of practical morality is to establish a harmonious balance between the intelligence and the feelings—to make a man's "I think this is right" correspond with his "I feel that it is so." Whether systematic training can do anything to make the attainment of this balance easier is a question that has lately engaged the attention of many educational reformers; and whatever future casuistry may still have before it would seem to lie along the lines indicated by them.

There is an excellent study of the ancient casuists by M. Raymond Thamin, *Un Problème moral dans l'antiquité* (Paris, 1884). For the Roman Catholic casuists see Döllinger und Reusch, *Moralstreitigkeiten im siebzehnten Jahrhundert* (2 vols., Nördlingen, 1889), and various articles ("Casuistik," "Ethik," "Moralsysteme," &c.) in Wetzer and Welte's *Kirchenlexicon* (Freiburg, 1880-1896). See also the editions of Pascal's *Provincial Letters*, by John de Soyres (with English notes, Cambridge, 1880), and A. Molinier (2 vols., Paris, 1891). The Anglican casuists are discussed in Whewell, *Lectures on Moral Philosophy* (London, 1862). For general reflections on the subject see the appendix to Jowett's edition of the Epistle to the Romans (London, 1855). Most modern text-books on ethics devote some attention to the matter—notably F.H. Bradley in his *Ethical Studies* (London, 1876). See also Hastings Rashdall, *Theory of Good and Evil* (2 vols., Oxford, 1907).

(ST. C.)

CASUS BELLI, the technical term for cases in which a state holds itself justified in making war, if a certain course to which it objects is persisted in. Interference with the full exercise of a nation's rights or independence, an affront to its dignity, an unredressed injury, are instances of *casus belli*. Most of the new compulsory treaties of arbitration entered into by Great Britain and other states exclude from their application cases affecting the "vital interests" or "national honour" of the contracting states. These may therefore be considered as a sort of definition of *casus belli* in so far as the high contracting parties to them are concerned.

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