

Caguins, or *Carvas*; in Auvergne, under that of *Marrons*. Considerable numbers of the Colliberts still live in the *Marais nouill's de la Sère*; and the Cagots may be found round Jaca, in Guipuzcoa, in Navarre, at Cherbittina d'Anbauze in the valley of Azun, near Saint-Jean-Pied-de-Port and Saint-Jean-le-Vieux, and in the villages of Agotetchiac, Tailhapé, and Ainchicharburu, but in largest numbers in Labour, in the Basque arrondissement of Bayonne.

See Michel, *Histoire des races maudites*; L'Abbé Venuti, *Recherches sur les Cahets de Bordaux*, 1754; *Bulletins de la Société Anthropologique*, 1861, 1867, 1868, 1871; *Annales médico-psychologiques*, Jan. 1867; M. Lagneau, *Questionnaire sur l'éthnologie de la France*.

CAHORS, a town in the south of France, formerly the capital of Cahourcin or Upper Quercy, and now of the department of Lot, on the high road between Paris and Toulouse, 358 miles S.W. from Paris, and 60 miles north of Toulouse, in 44° 27' N. lat., 1° 24' E. long. It stands on the right bank of the River Lot, on a rocky peninsula formed by a bend in the stream, and communicates with the opposite shore by three bridges,—one, the Pont Valendré, built in the 13th century, and surmounted by three massive towers. In the more ancient part of the town the streets are narrow and the houses antique; but in the modern and more elevated quarter there are many handsome buildings, with terraces which command an extensive view. The most remarkable building is the cathedral, built in the 11th or 12th century, and occupying the site, if not actually consisting of the remains, of an ancient Roman temple. Besides it, there is the theological seminary, the prefecture (formerly an episcopal palace), an academy, a theatre, a public library, and a monument erected to Fénelon in front of the cathedral. Cahors is the see of a bishop, and the seat of judicial and commercial tribunals of the first class. Its university, founded by Pope John XXII. in 1332, was incorporated with that of Toulouse in 1751. The principal articles of manufacture are stoneware, cotton-yarn, woollen stuffs, and paper; and it has a considerable traffic in oil, hemp, flax, hides, truffes, and a strong deeply-coloured wine, which is made in the neighbouring districts. Population of the town in 1872, 13,061, and of the commune 14,593.

Cahors is the ancient *Divona*, afterwards called *Civitas Cadurcorum*, from the Celtic tribe of which it was the capital, and still exhibits traces of its greatness during the Roman sway. The most conspicuous remains are those of an immense aqueduct, which conveyed the water to the city from a distance of about 1½ miles by a precipitous route along the mountain sides, and crossed the valley of Larroque-des-arcs on a bridge 180 feet high. There are also remains of baths and a theatre, a marble altar in front of the prefecture (erected, according to the inscription, in honour of Lucterius Leo); and a celebrated fountain, supposed to be the fountain *Divona*, and now called *Des Chartreux*, from the Carthusian convent to which it has been attached.

After the decline of the Roman empire Cahors passed in succession into the hands of the Goths, the Franks, the Saracens, and the Normans; and in the 12th century it was the subject of severe fighting between the English and French. In 1572 the Protestant party in the town were strong enough to prevent their fellow-citizens following the example of Paris; and yet a few years later, in 1680, we find the opposition to Henry of Navarre so violent that he only made himself master of the place after several days of conflict. The bishops of Cahors, who date from the 4th century, had formerly also the title of count, and used to lay their sword and gauntlets on the altar when about to officiate. During the Middle Ages the town is said to have been a great seat of the Caorsini (Cawertschen or Cauder-Wälsche), who preceded the Lombards as usurers and money-changers.

See Chandruc de Crazannes, *Coup d'œil sur les monuments historiques du département du Lot*; Dufour, *La commune de Cahors au moyen âge*, 1846.

CAILLE, NICOLAS LOUIS DE LA. See LA CAILLE.

CAILLIE, or CAILLÉ, RENÉ (1799–1838), a French traveller in Africa, was born in 1799 at Mauzé, and died in 1838. His school education extended no farther than

reading and writing; and at the age of sixteen he commenced his career by a voyage to Senegal. But already *Robinson Crusoe* had kindled within him an enthusiastic admiration for the life of the discoverer; and in 1827, having collected 2000 francs by toiling on an indigo plantation, he set out on his most important mission. From Kakundy he travelled east by Cambaya, Kankan, Time, and Tangrera, and north-east by Donasso as far as Galia, through a hitherto unvisited district; and from Galia he passed through the country explored by Mungo Park to Timbuctoo, which he reached on April 20, 1828. He thus won the prize of 10,000 francs offered by the Geographical Society of Paris to the first traveller who should gain exact information of Timbuctoo, to be compared with that given by Mungo Park. He also received the order of the Legion of Honour, a pension, and other distinctions, and it was at the public expense that his *Journal d'un Voyage à Tembouctou et Jenné dans l'Afrique Centrale, &c.*, was published in 1830.

CAIN, the eldest son of Adam and Eve according to the narrative of the Jehovist (Gen. iv.) Various derivations of the name have been suggested, the most probable being from קַיִן, "to obtain," the word used in Gen. iv. 1: "Eve bare Cain, and said, I have gotten a man from the Lord." According to the Biblical narrative (Gen. iv.) Cain was a tiller of the ground, while his younger brother, Abel, was a keeper of sheep. Enraged at the acceptance of Abel's offering by the Lord, and the rejection of his own, he slew his brother in the field. As a punishment he was expelled from Eden, and condemned to be a "fugitive and a vagabond" on the earth, a mark being set upon him "lest any finding him should kill him." He took up his abode in the land of Nod, on the east of Eden, where he built a city, which he named after his son Enoch. The narrative presents a number of difficulties, which commentators have sought to solve with more ingenuity than success. On the reason for the preference of Abel's offering to Cain's some light is thrown by the references in the New Testament (Heb. xi. 4; 1 John iii. 12). The phrase "the Lord set a mark upon Cain" is perhaps more accurately rendered "the Lord gave a sign to Cain," and has been variously explained as referring to some pledge of safety given to Cain personally, or to some sign of warning and prohibition to mankind in general. There is an apparent contradiction between the condemnation of Cain to lead a nomadic life (ver. 12) and his subsequent settlement in a city, which it has been sought to reconcile by making the doom refer to the natural restlessness of the criminal and estrangement from the Adamic home. The endeavours that have been made to fix the precise locality of the land of Nod are based upon mere conjecture. The implied existence of a considerable population on the earth (ver. 14) furnishes another difficulty, of which no explanation that has been offered seems completely satisfactory. The parallelism between the list of Cain's descendants (Gen. iv. 18) and the list of the descendants of Seth (Gen. v.) has led several critics to identify the two, though it is denied by others that the mere similarity of the names gives any reasonable ground for doing so.

A Gnostic sect of the 2d century were known by the name of Cainites. They are first mentioned by Irenæus, who connects them with the Valentinians. They believed that Cain derived his existence from the superior power, and Abel from the inferior power, and that in this respect he was the first of a line which included Esau, Korah, the Sodomites, and Judas Iscariot.

CAIRN (in Welsh, *Carne*), a heap of stones piled up in a conical form. In modern times cairns are often erected as landmarks. In ancient times they were erected as sepulchral monuments or tribal and family cemeteries.

The *Duan Eireannach*, an ancient Irish poem, describes the erection of a family cairn; and the *Senchus Mor*, a collection of Irish laws ascribed to the 5th century, prescribes a fine of three three-year-old heifers "for not erecting the tomb of thy chief." Meetings of the tribes were held at them; and the inauguration of a new chief took place on the cairn of one of his predecessors. It is mentioned in the *Annals of the Four Masters* that, in 1225, the O'Connor was inaugurated on the cairn of Fraech, the son of Fiodhach, of the red hair. In mediæval times cairns are often referred to as boundary marks, though probably not originally raised for that purpose. In a charter by King Alexander II. (1221), the boundary is described as passing "from the great oak in Malevin as far as the *Rune Pictorum*," which is explained as "the Carne of the Pecht's fieldis." In Highland districts small cairns used to be erected, even in recent times, at places where the coffin of a distinguished person was "reposed" on its way to the churchyard. Memorial cairns are still occasionally erected, as, for instance, the cairn raised in memory of the Prince Consort at Balmoral, and "Maule's Cairn," in Glenesk, erected by the earl of Dalhousie in 1866, in memory of himself and certain friends specified by name in the inscription placed upon it. See BARROWS.

CAIRNES, JOHN ELLIOTT, a distinguished political economist, was born at Drogheda in 1824, and died on the 8th July 1875. After leaving school he spent some years in the counting-house of his father, who was an extensive brewer. His tastes, however, lay altogether in the direction of study, and he was permitted to enter Trinity College, Dublin. He took the degree of B.A. in 1848, and six years later commenced as M.A. After passing through the curriculum of arts he engaged in the study of law and was called to the Irish bar. But he does not appear to have felt any very strong inclination for the legal profession, and during some years he occupied himself to a large extent with contributions to the daily press, treating of the social and economical questions that affected Ireland. The subject to which at this time he devoted most attention was political economy, which he studied with great thoroughness and care. While residing in Dublin he made the acquaintance of Archbishop Whately, who conceived a very high respect for his character and abilities. In 1856 a vacancy occurred in the chair of Political Economy at Dublin founded by Whately, and Cairnes received the appointment. In accordance with the regulations of the foundation, the lectures of his first year's course were published. The book appeared in 1857, with the title *Character and Logical Method of Political Economy*, and did not, perhaps, receive so much attention as it deserved. It follows up and expands J. S. Mill's treatment in the *Essays on some Unsettled Questions in Political Economy*, and forms a most admirable introduction to the study of economics as a science. In it the author's peculiar powers of thought and expression are displayed to the best advantage. Logical exactness, precision of language, and firm grasp of the true nature of economic facts, are the qualities characteristic of this as of all his other works. If the book had done nothing more, it would still have conferred inestimable benefit on political economists by its clear exposition of the true nature and meaning of the ambiguous term law. To the view of the province and method of political economy expounded in this early work the author always remained true, and several of his later essays, such as those on *Political Economy and Land*, *Political Economy and Laissez-Faire*, are but reiterations of the same doctrine.

His next contribution to economical science was a series of articles on the gold question, published partly in *Fraser's Magazine*, in which the probable consequences of the in-

creased supply of gold attendant on the Australian and Californian gold discoveries are analyzed with great skill and ability. The general conclusions arrived at in these papers with regard to the effects of the depreciation of gold—that finished manufactures would be on the average least altered in price; that raw produce, particularly the portion derived from the animal kingdom, would be most seriously affected; and that, on the whole, the section of the population most nearly concerned in the movement would be the class of labourers or artisans—are highly interesting, and have been confirmed to a remarkable extent by recent statistical researches. The further inferences drawn as to the international results likely to follow on the introduction into the several currencies of so large a mass of gold have not been borne out to the same extent. The facts were too complex to admit of accurate prediction. The articles attracted much attention at the time, and were highly commended by the most competent judges. A critical article on M. Chevalier's work *On the Probable Fall in the Value of Gold*, which appeared in the *Edinburgh Review* for July 1860, may be regarded as the sequel to these papers.

In 1861 Cairnes was appointed to the professorship of political economy and jurisprudence in Queen's College, Galway, and in the following year he published his admirable work *The Slave Power*, one of the finest specimens of applied economical philosophy. The inherent disadvantages of the employment of slave labour are exposed with great fulness and ability, and the conclusions arrived at have taken their place among the recognized doctrines of political economy. To a very large extent the opinions expressed by Cairnes as to the probable issue of the war in America were verified by the actual course of events.

During the remainder of his residence at Galway Professor Cairnes published nothing beyond some fragments and pamphlets, mainly upon Irish questions in which he was deeply interested. The most valuable of these papers are the series devoted to the consideration of university education in Ireland. His health, at no time very good, was still further weakened in 1865 by a fall from his horse, which inflicted severe injury on one of his legs. He was ever afterwards incapacitated from active exertion, and was constantly liable to have his work interfered with by attacks of illness. In 1866 he was appointed professor of political economy in University College, London. He was compelled to spend the session 1868–69 in Italy, but on his return continued to lecture till 1872. During his last session he conducted a mixed class, ladies being admitted to his lectures. His health soon rendered it impossible for him to discharge his public duties; he resigned his post in 1872, and retired with the honorary title of Emeritus Professor of Political Economy. In 1873 his own university conferred on him the degree of LL.D.

The last years of his life were spent in the collection and publication of some scattered papers contributed to various reviews and magazines, and in the preparation of his most extensive and important work. The *Political Essays*, published in 1873, comprise all the papers relating to Ireland and its university system, together with some other articles of a somewhat similar nature. The *Essays in Political Economy, Theoretical and Applied*, which appeared in the same year, contain the essays towards a solution of the gold question, brought up to date and tested by comparison with statistics of prices. Among the other articles in the volume the more important are the criticisms on Bastiat and Comte, and the *Essays on Political Economy and Land*, and on *Political Economy and Laissez-Faire*, which have been referred to above. In 1874 appeared his largest work, *Some Leading Principles of Political Economy, newly Expounded*, which is beyond doubt a

worthy successor to the great treatises of Smith, Malthus, Ricardo, and Mill. It does not expound a completed system of political economy; many important doctrines are left untouched; and in general the treatment of problems is not such as would be suited for a systematic manual. The work is essentially a commentary on some of the principal doctrines of the English school of economists, such as value, cost of production, wages, labour and capital, and international values, and is replete with keen criticism and lucid illustration. While in fundamental harmony with Mill, especially as regards the general conception of the science, Cairnes differs from him to a greater or less extent on nearly all the cardinal doctrines, subjects his opinions to a searching examination, and generally succeeds in giving to the truth that is common to both a firmer basis and a more precise statement. The last labour to which he devoted himself was a republication of his first work on the *Logical Method of Political Economy*, which had long been out of print. The second edition appeared in April, a few months before the author's untimely death.

Taken as a whole the works of Cairnes form the most important contribution to economical science made by the English school since the publication of J. S. Mill's *Principles*. As has been already pointed out, they possess especial value by reason of the writer's firm grasp of the nature, method, and limits of the science he is engaged in expounding. It is not possible to indicate more than generally the special advances in economic doctrine effected by him, but the following points may be noted as establishing for him a claim to a place alongside of Ricardo and Mill:—(1.) His exposition of the province and method of political economy. He never suffers it to be forgotten that political economy is a science, and consequently that its results are entirely neutral with respect to social facts or systems. It has simply to trace the necessary connections among the phenomena of wealth, and dictates no rules for practice. Further, he is distinctly opposed both to those who would treat political economy as an integral part of social philosophy, and to those who have attempted to express economic facts in quantitative formulae, and to make economy a branch of applied mathematics. According to him political economy is a mixed science, its field being partly mental, partly physical. It may be called a positive science, because its premises are facts, but it is hypothetical in so far as the laws it lays down are only approximately true, i.e., are only valid in the absence of counteracting agencies. From this view of the nature of the science, it follows at once that the method to be pursued must be that called by Mill the Physical or Concrete Deductive, which starts from certain known causes, investigates their consequences, and verifies or tests the result by comparison with facts of experience. It may, perhaps, be thought that Cairnes gives too little attention to the effects of the organism of society on economic facts, and that he is disposed to overlook what have recently been called by Mr Bagehot the postulates of political economy. (2.) His analysis of cost of production in its relation to value. According to Mill, the universal elements in cost of production are the wages of labour and the profits of capital. To this theory Cairnes objects that wages, being remuneration, can in no sense be considered as cost, and could only have come to be regarded as cost in consequence of the whole problem being treated from the point of view of the capitalist, to whom, no doubt, the wages paid represent cost. The real elements of cost of production he looks upon as labour, abstinence, and risk, the second of these falling mainly, though not necessarily, upon the capitalist. In this analysis he to a considerable extent follows and improves upon Senior, who had previously defined cost of production as the sum of the labour and abstinence neces-

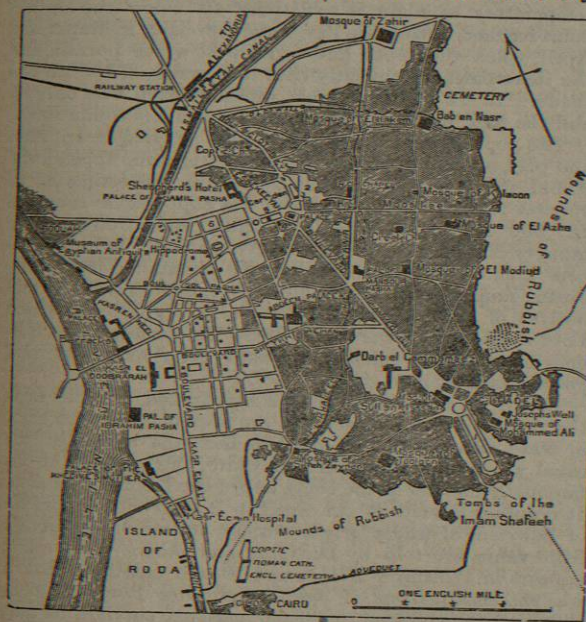
sary to production. (3.) His exposition of the natural or social limit to free competition, and of its bearing on the theory of value. He points out that in any organized society there can hardly be the ready transference of capital from one employment to another, which is the indispensable condition of free competition; while class distinctions render it impossible for labour to transfer itself readily to new occupations. Society may thus be regarded as consisting of a series of non-competing industrial groups, with free competition among the members of any one group or class. Now the only condition under which cost of production will regulate value is perfect competition. It follows that the normal value of commodities—the value which gives to the producers the average and usual remuneration—will depend upon cost of production only when the exchange is confined to the members of one class, among whom there is free competition. In exchange between classes, or non-competing industrial groups, the normal value is simply a case of international value, and depends upon reciprocal demand, that is to say, is such as will satisfy the equation of demand. This theory is a substantial contribution to economical science, and throws great light upon the general problem of value. At the same time, it may be thought that Cairnes has overlooked a point brought forward prominently by Senior, who also had called attention to the bearing of competition on the relation between cost of production and value. The cost to the producer fixes the limit below which the price cannot fall without the supply being affected; but it is the desire of the consumer—i.e., what he is willing to give up rather than be compelled to produce the commodity for himself—that fixes the maximum value of the article. To treat the whole problem of natural or normal value from the point of view of the producer is to give but a one-sided theory of the facts. (4.) His defence of the wages fund doctrine. This doctrine, expounded by Mill in his *Principles*, has not been universally accepted even by British economists, and has recently been assailed with great vigour by Thornton and F. D. Longe. In consequence of these attacks it has been relinquished by Mill, but Cairnes still undertakes to defend it. He certainly succeeds in removing from the theory much that has tended to obscure its real meaning, and in placing it in its very best aspect. He has also shown the sense in which, when treating the problem of wages, we must refer to some fund devoted to the payment of wages, and has pointed out the conditions under which the wages fund may increase or decrease. But he has not, it seems to us, been successful in showing that the theory is fruitful, or gives any satisfactory explanation of the many complicated questions connected with the varying rates of wages.

These points, of course, do not comprehend all or nearly all that Cairnes has handled in his peculiarly fresh and attractive manner. *The Leading Principles*, for instance, contain admirable discussions on trades unions and protection, together with a clear analysis of the difficult theory of international trade and value, in which there is much that is both novel and valuable, while numerous minor topics are treated throughout the volume. *The Logical Method* contains the best exposition and defence known to us of Ricardo's theory of rent; and the *Essays* contain what is probably the most complete and successful criticism of Bastiat's economic doctrines. (R. AD.)

CAIRNGORM, or CAIRNGORUM, a name popularly applied to a wine-yellow or brown variety of rock crystal found, among other localities, on the Grampian Mountains in the south east of Banffshire, Scotland, the central peak being called Cairngorm. The colour of the crystals, which is due to a minute proportion of iron oxide, varies, passing through those above noted as belonging properly to cairngorms, into a dull grey, smoky quartz, and to a black

variety, called morion. The same stone is found in commerce passing under the names of false topaz, Brazilian topaz, occidental topaz, and cinnamon stone (*Pierre de cannelle* of the French). It is found in many parts of the world, Brazil producing the finest deep brown varieties; but fine stones also come from India, Bohemia, Mexico, and Pennsylvania. It is also found at the Carnbrae Mines, in Cornwall. In the cairngorm district masses weighing as much as 25 lb have been obtained, and an Edinburgh lapidary cut nearly £400 worth of ornamental stones out of a single crystal. The cairngorm is chiefly used for Scotch jewellery, the mounting of gold and silver plaid-brooches, setting in the lids of snuff-mulls, the handles of dirks, &c., and the ornamentation of other articles connected with the Highland costume. The stones are most effectively set by covering the undersets entirely with oblong facets arranged in regular rows, surrounding the table with triangular facets and keeping the stone as thick as possible. By this means great brilliancy, combined with depth of colour, is secured.

CAIRO (in Arabic, Masr-al-Kahira, or, as the lower classes of the population call it, simply Masr), the modern capital of Egypt, occupies the natural centre of the country,



Ground-Plan of Cairo.
1. Kasr-meidan (Place Mehemet Ali). 4. French Theatre.
2. Rosetti Gardens. 5. Opera House.
3. Post-Office. 6. English and German Churches.

being situated on the east bank of the Nile, 12 miles above the apex of its delta, 150 miles by rail from Alexandria, and 80 west from Suez, in 30° 2' 4" N. lat. and 31° 15' 26" E. long. It is built partly on the plain and partly on the lower slopes of the rocky range of Mokattam, on a spur of which stands the citadel, 250 feet above the level of the town. The prospect from the ramparts of this fortress is one of great magnificence and beauty. Below lies the city with its strongly-built walls and lofty towers, its gardens and squares, its palaces, and its mosques, in all the beauty of their delicately-carved domes and minarets covered with fantastic tracery, the port of Bulak, the gardens and palace of Shubra, the broad river studded with islands, the valley of the Nile dotted with groups of trees, with the pyramids

on the north horizon, the fields, gardens, and villas on the west, and on the east the barren cliffs, backed by an ocean of sand.

As far as the portion within the walls is concerned, Cairo occupies a site of about seven miles in circumference; but during the reign of the khedive (properly *hidiv*), who was born in the city in 1830, it has extended, especially towards the river, so as to have a circuit of at least 8 or 9 miles. Its improvement has kept pace with its extension, and it can no longer be altogether described as little better than a labyrinth of tortuous lanes, narrow, unpaved, and continually swept with clouds of dust blown from huge mounds of rubbish outside the walls. New streets have been cut through the more crowded districts; and the Ezbekeyah, the principal square of the city, which was formerly allowed to lie waste, has been transformed into public gardens with a lake in the centre, while houses and shops of considerable pretensions have sprung up in the neighbourhood. Most important of the new streets is the Boulevard Mehemet Ali, which traverses the city in an almost northerly direction from the Citadel to the Ezbekeyah. Between the western side of the older city and the river most of the ground has been laid out in building lots, and in various parts, as particularly in the direction of Bulak, it is already covered with regular rows of houses, and forms the district of Ismaïleeyah. Bulak, in fact, is not so much a distinct town as a mere suburb of the larger city. Gas has been laid down in all the principal streets, and water is supplied by a company to the houses of all those who comply with the necessary regulations. In spite of all these innovations, however, the city largely retains its Oriental character, and in a hundred of its narrow streets it is easy to forget that any change at all has taken place.

The most of the houses of the poorer classes consist of miserable mud hovels, with filthy courts, dilapidated windows, and tattered awnings. In marked contrast to these are the houses of the wealthier citizens, built generally in a style of elaborate arabesque, the windows shaded with projecting cornices of graceful woodwork, and ornamented with stained glass. A winding passage leads through the ornamented doorway into the court, in the centre of which is a fountain shaded with palm-trees. The principal apartment is generally paved with marble; in the centre a decorated lantern is suspended over a fountain, whilst round the sides are richly inlaid cabinets and windows of stained glass; and in a recess is the *divan*, a low, narrow cushioned seat running round the walls. The basement story is generally built of the soft calcareous stone of the neighbouring hills, and the upper story, which contains the harem, of painted brick.

The town is walled off into quarters, deriving their names from the character or condition of their occupants, and is intersected in its whole breadth by a canal which conveys the waters of the Nile from Old Cairo to the different parts of the city. The citadel or El-Kalah was built by Saladin about 1166, but it has since undergone frequent alteration, and now contains a palace erected by Mehemet Ali, and a mosque of Oriental alabaster founded by the same pasha on the site of "Joseph's Hall." In the centre is a well called Joseph's Well, sunk in the solid rock to the level of the Nile. Next to the citadel in importance are the mosques, 400 in number, including, however, many that are falling to ruins. The most magnificent is the Mosque of Sultan Hasan, standing in the immediate vicinity of the citadel. It dates from 1357, and is celebrated for the grandeur of its porch and cornice, and the delicate honey-comb tracery which adorns them. Besides it there is the Mosque of Tulun (founded 879 A.D.), exhibiting very ancient specimens of the pointed arch; the Mosque of Sultan el

Hakem, the fanatical patron of the Druzes, founded in 1003; the Mosque Al Azhar ("The Splendid"), which is principally famous as the seat of a Mahometan university, in which gratuitous instruction is given in the Koran; and the Mosque of Sultan Kalaoun, attached by its founder to the great Morostan or madhouse, which he established in 1287. The Morostan is no longer used for its original purpose, having been superseded by an asylum at Bulak. There is also a large general hospital situated between Bulak and Old Cairo, under the charge of native doctors.

On the east of the city are the splendid structures erroneously known to Europeans as the tombs of the caliphs; they really belong to the Circassian or Borgite Mamelukes, a race extinguished by Mehemet Ali. Their lofty gilt domes and fanciful network of arabesque tracery are falling to ruins, and the mosques attached to them are the haunts of a few solitary sheikhs, and of hordes of Arab beggars.

Among the buildings which owe their existence to modern European influence, the Italian opera, the French theatre, and the hippodrome may be mentioned. In Bulak is situated the Government printing-press, established by Mehemet Ali, from which numerous Oriental works and translations of French originals are issued from time to time; and in a building by the river side is accommodated the unrivalled collection of Egyptian antiquities made by M. Mariette for the khedive. The manuscripts which were formerly scattered among the various mosques and other institutions were recently collected to form a public library in the palace of the Darb Algamâmiz or Sycamore Street. The catalogue already occupies 333 pages, and the collection is especially rich in copies of the Koran and works of grammatical exegesis. In 1875 a geographical society was founded by the khedive for purposes of African discovery. A few periodicals are published in the city, but in this respect Cairo is much behind Alexandria. The scheme of public instruction is mainly that which was organized by Mehemet Ali, and embraces primary, preparatory, and special schools. In 1872 there were 1025 students and 141 teachers in the Government colleges, and the national schools were attended by 4721 pupils, while in the Mosque Al Azhar 6774 were enrolled. The higher scholastic institutions comprise a commercial and a juridical school at the Darb Algamâmiz, a school of arts and industry at Bulak, and military schools at the Abbasseeyah. There are several Christian churches and missionary stations in the city, and most of these maintain some educational machinery, so that there are Armenian, Greek, Coptic, Roman Catholic, and Protestant schools. Of special interest to Englishmen is Miss Whately's institution in the Abbasseeyah road.

The commerce of Cairo is of considerable extent and variety, but consists mainly in the transit of goods. Gum, ivory, hides, and ostrich feathers from the interior, cotton and sugar from Upper Egypt, indigo and shawls from India and Persia, sheep and tobacco from Asiatic Turkey, and European manufactures, such as machinery, hardware, cutlery, glass, and woollen goods, are the more important articles. The traffic in slaves, which was at one time so striking a feature of the place, is still carried on to a certain extent. In Bulak are several factories founded by Mehemet Ali for spinning, weaving, and printing cotton, and a paper-mill established by the khedive in 1870 at a cost of about £80,000. Various kinds of paper are manufactured, and especially a fine quality for use in the Government offices. In the island of Rhoda, or Roudah, there is a sugar-refinery of considerable extent, founded in 1859, and principally managed by Englishmen. Silk goods, saltpetre, gunpowder, leather, &c., are also manufactured. An iron bridge has been erected over the Nile between the Kasr ed Dubbara on the right bank and

Gezirah on the left; and new carriage roads, bordered by acacias and sycamore trees, have been constructed to Heliopolis and the pyramids of Gizeh respectively. The terminus of the railway lines of the delta and isthmus is situated to the north of the city, but the Upper Egypt line stops short on the left bank of the river at Embabah opposite Bulak, and the trains have to be taken across by a ferry.

From the central situation of Cairo, and its proximity to the hot sandy deserts, the temperature is much higher there than near the coast; but the diseases which infest it, such as the plague, ophthalmia, and malignant fevers, seem to originate in its "stifled filth," and other local causes, which advancing civilization will greatly remove, rather than in the unhealthiness of its situation. Its death-rate is greater than that of any European capital, but this is partly to be accounted for by the fact that numbers of natives come to the city in order that their last hours may be spent within its walls. The greatest mortality is during winter, and a larger proportion of deaths is caused by consumption than by any other disease. The average temperature throughout the year is 71°-16 Fahr.; but the mean of the separate months varies from 54° in January to 86° in August. The temperature by night is sometimes 40° below the highest point reached during the day, more especially in March and April, when the south and south-west winds prevail, and the thermometer frequently rises to upwards of 100° in the shade. In 1871 the number of rainy days was only 9, and the total duration of the fall was 9 hours 8 minutes.

The population of Cairo is of a very mingled description, and presents a very picturesque and interesting appearance. About the beginning of this century it was estimated to amount to about 200,000, which was supposed to comprise 121,000 Mahometans, 60,000 Copts, 4,000 Jews, and a number of Franks, Greeks, and Armenians. It now numbers about 350,000, which may be distributed in the following proportions:—285,000 natives, 25,000 Nubians and natives of the Soudan, 10,000 Turks, 30,000 Jews and Levantines, and upwards of 19,000 Europeans. The German and English colonies are both pretty numerous, and possess each its own church.

About 2½ miles S.W. of the citadel, and 1½ mile from the S.W. angle of the city, lies the town of Misr-al-Atikah, or Old Cairo, situated on the Nile near the mouth of the canal which now flows through Cairo, and opposite to the famous Nilometer at the south end of the Island of Raudah. It occupies the site of the ancient Roman city or fortress of Babylon, of whose origin various stories of apparently little value are told by Diodorus and others. The place appears in Ptolemy's *Tables*, and Strabo mentions that it was the headquarters of one of the three Roman legions that garrisoned Egypt. Roman masonry survives as part of a convent enclosure, which is known by the name Kasr-es-Shammah ("Palace of Perfume") and Dair-en-Nasarah ("Convent of Christians"). The name Babylon of Egypt, or Babylon simply, is frequently employed in mediæval writings as synonymous with Cairo, or as denoting the successive Mahometan dynasties of Egypt. This use may have been influenced by the association of the other Babylon, as represented by Baghdad, with the power of Islam; but at the same time it was a real survival from the ancient name; for Babylon on the Nile is mentioned by Gregory of Tours (*circa* 580 A.D.), in connection with the *Granaries of Joseph—i.e.*, the Pyramids. Here Amru the famous conqueror of Egypt for the Caliph Omar (638) founded a city to which was given the name of Fostât, it is said from Amru's skin tent (so called in Arabic). This continued to be the capital of Egypt for upwards of 330 years. In 973 it was superseded by a new city founded shortly before by Jauher (Gowher), captain of the first

Fatimite caliph, Al Moez, whose army had conquered Egypt in 969. It is said that the new city was originally the camp of Jauhar whilst besieging Fostât, which gradually grew into a town, and got the name of Al Kâhira ("Victrix"), whence our Cairo. In 1176 the city was attacked by the Franks; and shortly afterwards it was fortified by Saladin. From 1507 to 1798 it remained the capital of the Turkish province of Egypt; but in the latter year it was captured by the French, who kept possession till they were driven out in 1801 by the Turkish and English forces. Mehemet Ali secured his position by the massacre of the Mamelukes in the citadel in 1811, and laid the basis of the present independence of Egypt.

CAISSON, in engineering work, is a chamber of iron or wood which is used in the construction of subaqueous foundations,—such as those required for the piers of bridges, &c. Its object is the same as that of a coffer-dam, viz., to allow the work to be carried on below the water-level,—but it is used in places where either the water or the permeable soil is too deep to allow a dam to be erected. In cases where the bridge piers are hollow cylinders of iron, they not unfrequently form their own caissons,—their own weight, or that of ballast placed upon them, forcing their lower edges into the ground. The material left within them is dredged up or excavated as they descend. Where, however, the soil is not so soft, or is mixed with stones, this self-lowering becomes impossible. The lower part of the caisson is then commonly formed into an air chamber, open at the bottom, and resting upon the bed of the river. Air is pumped into this at a pressure corresponding to its depth below the surface of the water, and the excavation is carried on by men working in the compressed air as in a large diving-bell. In some cases the masonry of the pier is built within the caisson on the top of the chamber as it descends, the chamber itself being eventually filled up with masonry or concrete, and left to form the permanent base of the structure; in others the caisson is lowered (as the excavation goes on) by weights; and when the required depth has been reached, the masonry is commenced within the air-chamber, and the whole caisson raised again as the building proceeds. Probably the largest caissons ever used are those of the East River Suspension Bridge (a structure still unfinished) at New York, of which one was 172 feet long by 102 feet wide. See BRIDGES. For military caissons see FORTIFICATION.

CAITHNESS, the most northern county of the Scottish mainland, bounded W. and S. by Sutherlandshire, and E. and N. by the Northern Ocean, is situated between 58° 8' and 58° 40' N. lat., 3° 0' and 3° 55' W. long., and has an extreme length of 53 miles, an extreme breadth of 33, a coast line of 105 miles, and an area of 455,708 acres or 712 square miles. The form of Caithness resembles an irregular triangle, having as its greatest side the line of coast on the S.E., stretching from the Ord of Caithness to Duncansby Head. The surface of the county generally is flat and tame, consisting for the most part of barren moors, and being almost entirely destitute of trees. It presents a gradual slope from the north and east upwards to the ridge of hills on the west and south, which separates it from Sutherlandshire, and on the southern boundary, where it is bifurcated, attains considerable elevation. The one branch, called the Maiden Paps, contains the peak of Morven, 2334 above the level of the sea; the other, continuing in the line of the main ridge, juts into the sea, and terminates in the huge granitic precipice of the Ord. In the centre of the county, hemmed in by the hills on the western boundary, the ridge of the Maiden Paps, and the sea, is a large undulating plain comprising nearly four-fifths of the whole extent. On its southern side it is broken up by several detached hills, and in the interior contains a con-

siderable number of small lakes. The most depressed part of the county lies in the peninsula formed in the north-east corner by the indentation of Dunnet Bay and Sinclair Bay. The more elevated portion presents a light sandy soil, which admits of considerable cultivation, but the low grounds are covered with extensive morasses, producing only heath and rough grass.

The geological formation consists chiefly of sandstone, sandstone flag, and occasionally limestone; but granite and gneiss are also found in the west. On the east Caithness presents a precipitous coast, with scarcely a creek in which a vessel, even of small size, can find shelter. On the northern coast, where the Pentland Firth separates it from the Orkney islands, stand at the distance of 13 miles from each other the two bold headlands of Duncansby Head on the north-east and Dunnet Head on the north-west. The latter, the most northern point of Scotland, is situated in 58° 40' N. lat. and 3° 21' W. long., and is crowned by a lighthouse, with a fixed light, built on the rock 346 feet above the level of the sea; while the former is marked by the white steeple of Canisby on the west. The navigation of the Pentland Firth is attended with considerable danger, from the strength and eddies of the current. Off the island of Stroma, which is separated from the mainland by a strait three miles broad, is a small vortex called the Swalchie; while nearer the shore are the "Merry Men of Mey," a group of breakers caused by eddies between projecting headlands. On the east coast, in addition to the harbour of Wick, erected in 1831, at a cost of above £40,000, and since improved at further expense, there is a small harbour at Sarclett and another at Staxigoe, a small pier at Clyth and another at Lybster. On the northern coast Scrabster roads in Thurso Bay afford tolerably good anchorage, while at Thurso and Sandside Bay are commodious harbours for larger vessels.

The climate of Caithness is variable, but not unhealthy; and though the winter storms fall with great severity on the unsheltered coast, yet from its proximity to a large expanse of sea the cold is not intense and snow seldom lies many days continuously. In winter and spring the northern shore is subject to frequent and disastrous gales from the N. and N.W. The waters of Fors, Thurso, and Wick, are the principal streams which traverse the county, but none of them are of any particular importance. The largest lochs are those of Watten and Cathel; there are numerous small ones well stocked with trout.

A great change has been effected in the agricultural position of Caithness, chiefly by the late James Traill, Esq. of Ratter. The farms along the coast are still mostly in the hands of small farmers, who cultivate the soil only during the intervals of the fishing-season; but inland, in the more elevated districts, and along the banks of the principal streams, the land is let out into large farms, with leases long enough to encourage the holder to improve the soil and practise a rotation of crops. The average extent of land held by each occupier, in 1874, was 39 acres, much larger than the average in Sutherlandshire, which only amounted to 10 acres in the same year. In the pasturage ground, black cattle and sheep, chiefly of the Leicester and Cheviot breeds, are reared for the southern markets; and, independently of the weekly corn-markets at Thurso and Wick, the rapidity of communication with the south is opening up a valuable market for the produce of the dairy and farmyard.

The principal crops raised are oats, beans, potatoes, and turnips; wheat can be grown only where draining has been carried to considerable perfection. In 1874 there were only 87 acres in wheat, 1895 in barley, 70 in rye, and 27 in peas; while oats occupied 33,071 acres, turnips 14,045, and potatoes 2190. In the same year there were 21,567